# Configuring the Lyra 22/24, RM126x DVK UART Baud Rate and RTS/CTS Handshaking

## Lyra 22 S/P Series, Lyra 24 S/P Series, RM126x Series Development Kits

*Application Note* *v1.1*

## 1 Introduction

The DVKs for Lyra 22, Lyra 24 and RM126x have a built in a Virtual Com Port (VCOM) that provides USB to Serial conversion between a PC connected over USB and the UART port on the radio module's EFR32BG22 MCU. The DVK's default UART rate out of the box is 115200. For applications that require either faster or slower speeds on the UART, the rate must be changed on both the EFR32BG22 and the VCOM port. This can be done using the console within Simplicity Studio.

This document walks through the steps for making UART Baud rate changes when using AT Interface, Bluetooth Xpress and bare metal code applications.

## 2 Requirements

The following equipment and resources are needed:

**Development Kits**

- (453-00090-K1) Lyra 22 Series – PCB Development Kit with integrated antenna option
- (453-00091-K1) Lyra 22 Series – SIP Development Kit with various antenna options
- (453-00142-K1) Lyra 24 Series – 10dBm PCB Development Kit with integrated antenna option
- (453-00145-K1) Lyra 24 Series – 20dBm PCB Development Kit with integrated antenna option
- (453-00148-K1) Lyra 24 Series – 20dBm PCB Development Kit with RF trace pad
- (453-00170-K1) Lyra 24 Series – 10dBm SIP Development Kit with integrated antenna option
- (453-00091-K1) RM126x Series – LoRaWAN Development Kit with external antenna option

**Software, Firmware, Tools & Utilities**

- For programming our Lyra 22 S/P, Lyra 24 S/P modules, please obtain the latest available firmware images. Please refer to section *3 - Firmware Versions* in the Lyra 22 and 24 Series – Firmware Options and Upgrade Methods Users Guide for more information. Lyra firmware is available at:
  - https://github.com/LairdCP/Lyra_Firmware (Lyra 22)
  - https://github.com/LairdCP/Lyra_24_Firmware (Lyra 24)
- For programming our RM126x modules, please obtain the latest available firmware images. Please refer to section *3 - Firmware Versions* in the https://www.lairdconnect.com/documentation/user-guide-firmware-options-and-upgrading-rm126x-series for more information. RM126x firmware is available at:
  - https://github.com/LairdCP/RM126x_Firmware
- Simplicity Studio 5 for Windows, Linux or Mac → https://www.silabs.com/developers/simplicity-studio



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# 3 SETUP

Programming the application FW onto the modules is beyond the scope of this document. Information on programming can be found in the resources and links provided below. To prepare each of the DVKs follow the steps below.

- Download and extract the latest firmware image files locally for further use and programming.
- Connect your DVK to your PC via the included USB micro cable.
- Program the DVK as described in the respective Firmware Options and Upgrade Methods User Guide for your DVK. See Requirements for links to these documents.

With your PC's USB connected to the USB port on the DVK open Simplicity Studio and launch the console as shown below. The following screenshots have been taken with a Lyra P DVK but applies to all three DVKs leveraging an EFR32BG22 MCU.

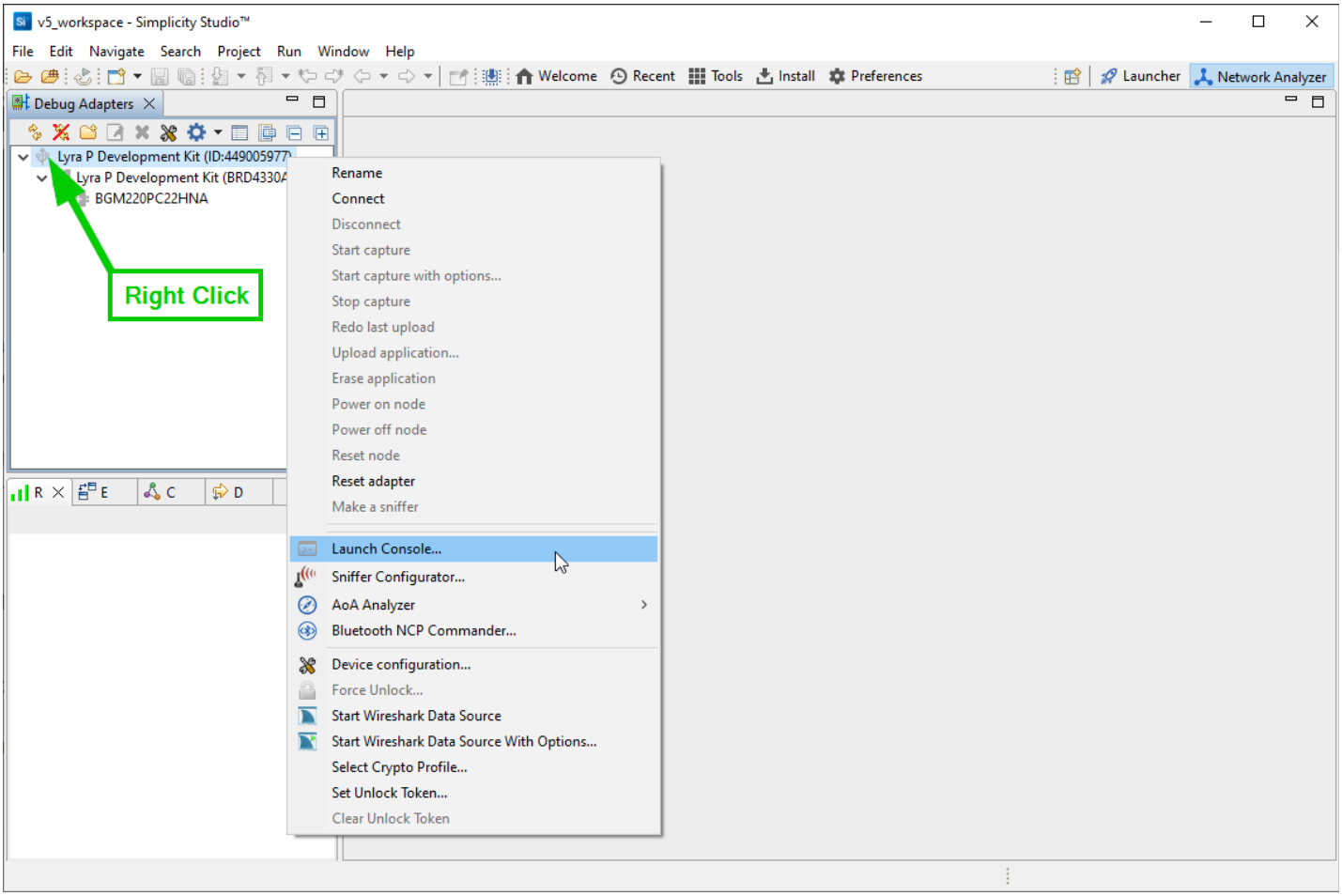


***Figure 1: Launching Console in Simplicity Studio***



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# 4 Bluetooth Xpress Application

Select Serial 1 and press **Enter**. The Wireless Xpress console will respond with *Ready*.

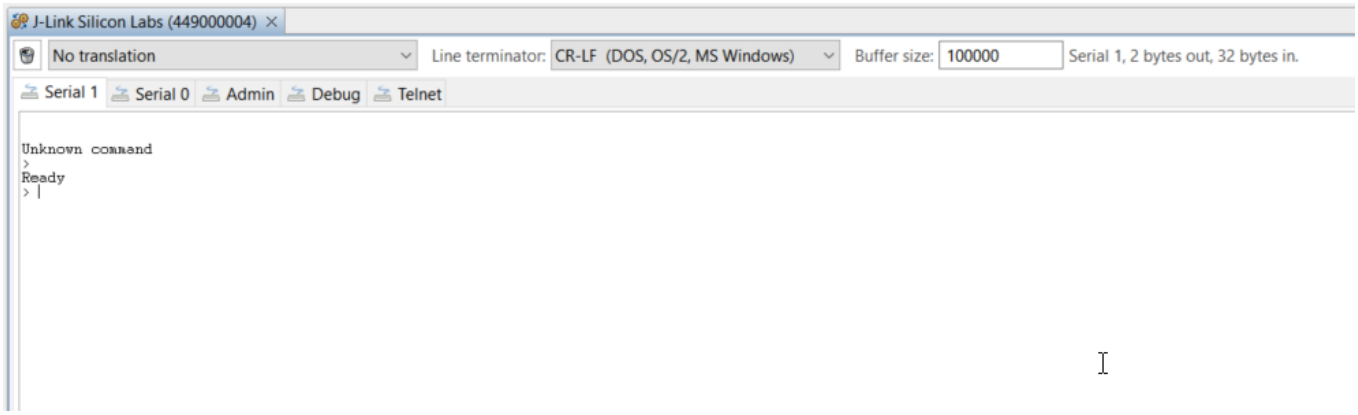


***Figure 2: Serial 1 Console Tab Opening Bluetooth Xpress Communication***

To change the rate on the EFR32BG22 UART type the command:

```
set ua b <new rate>
```

Commit the change by typing command:

```
save
```

The new rate can be read back for verification via command:

```
get ua b
```

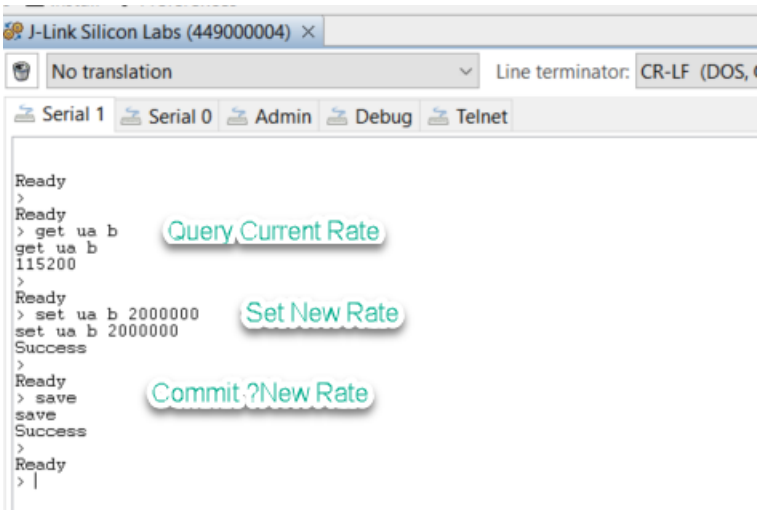


***Figure 3: Changing UART Rate on EFR32BG22 MCU***

Next, change the baud rate of the VCOM. In the console window select the admin tab, and then press **Enter**.



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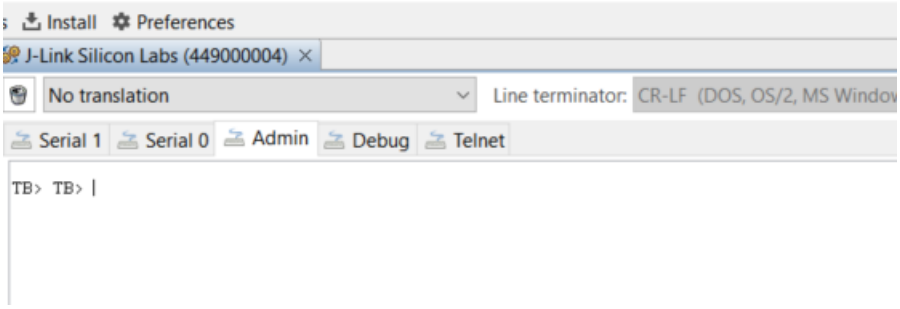


***Figure 4: Admin Console Tab Opening Communication with VCOM Port***

Change the rate by typing the command:

```
serial vcom config speed <new rate>
```

The new rate and all other UART parameters can be read via the following command:

```
serial vcom
```

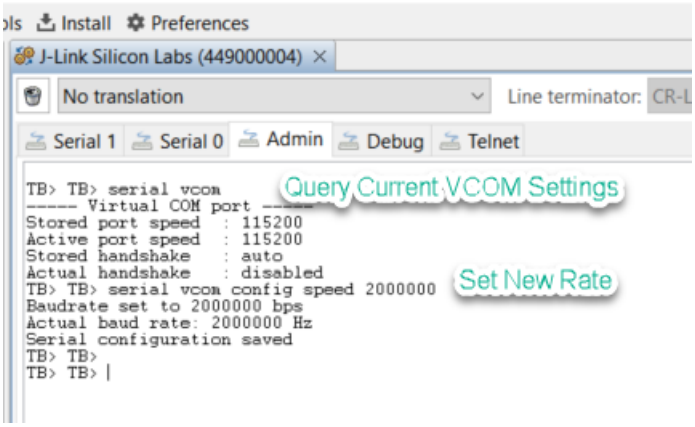


***Figure 5: Changing UART Rate on VCOM Port***

Switch back to Serial 1 console tab and press the reset button on the DVK. You should now be able to use the serial port at the newly configured rate (In this case, 2Mb).

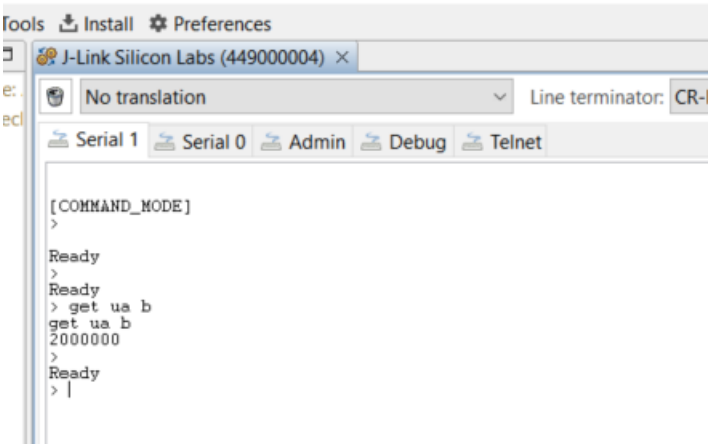


***Figure 6: DVK UART Rate Change Committed***



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# 5 AT Interface Application

When using the AT Interface application, the process for changing UART rate is the same as with Wireless Xpress with the exception of the Serial 1 commands to the EFR32BG22 MCU itself, which is communicating via known AT commands.

To configure the baud rate via AT commands, open the console window and select the *Serial 1* tab. Within Simplicity Studio, the console output shows ERROR 05 but the serial communication is valid as is verified by valid command/response output.

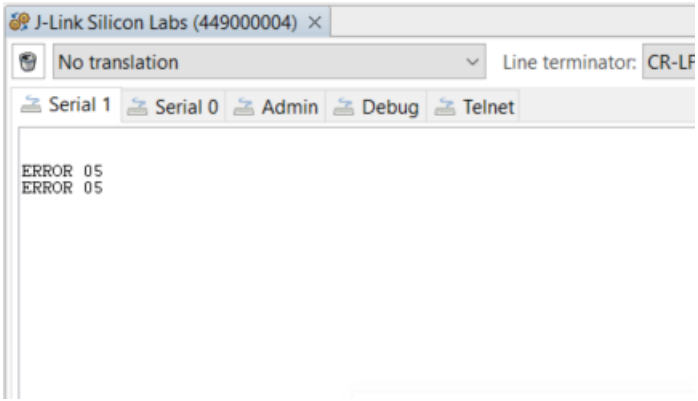


***Figure 7: Serial 1 Console Tab Opening AT Interface Communication***

The S Register 302 is used for the UART Baud rate configuration.

**Note:** The maximum Baud rate supported when using AT Interface Application is 1000000.

| | |
|---|---|
| 302 | *UART Baud rate*<br>This specifies the baud rate to use for commands and data transfer. After setting, a power cycle or a warm reset will be required. |

From the Serial 1 console type the following commands to view and configure the UART rate.

`ATS 302=?` (Query current rate )

`ATS 302=<desired rate>` (Set new rate)

You must commit and save the new rate by issuing the **AT&W** command. Without this command, the new value will not be retained and the default setting of 115200 will be restored on a reset or a power cycle.

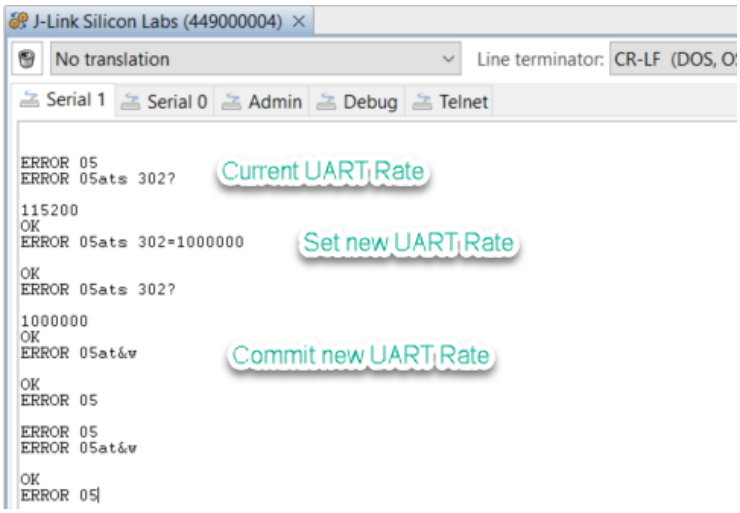


***Figure 8: Changing UART Rate on EFR32BG22 MCU Using AT Commands***



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Next, open the Admin tab in the console to configure the VCOM rate.

The VCOM Admin commands are completed in the same manner as was shown previously when using Bluetooth Xpress Application.

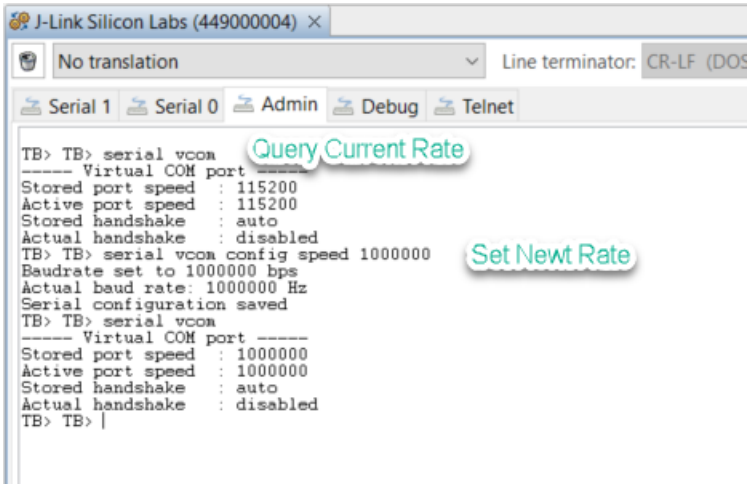


***Figure 9: Changing UART Rate on VCOM Port***

Reset the DVK for new UART Baud rate settings to take effect.

# 6 UART Hardware RTS/CTS Handshaking

When using the Lyra 22/24 Bluetooth Xpress or AT Interface firmware and operating the VSP mode at high data rate, it is recommended to permanently enable hardware RTS/CTS handshaking over Simplicity Studio's Admin Console. To get into the console, please follow the above sections similarly to changing the UART baud rate.

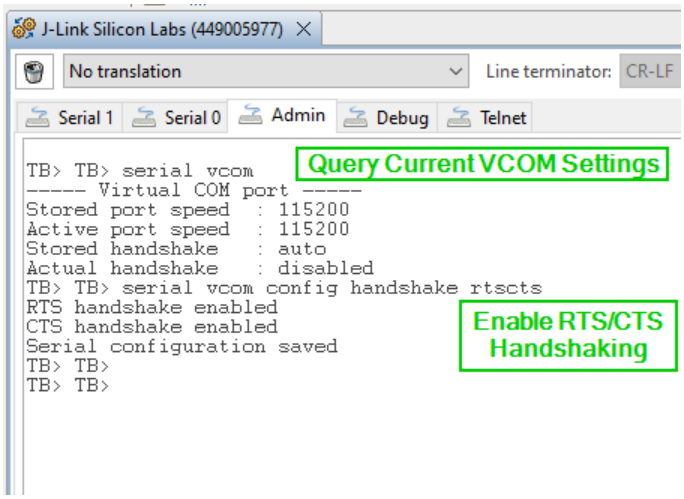


***Figure 10: Enabling RTS/CTS Hardware Handshake on VCOM Port***

Reset the DVK for new UART Baud rate settings to take effect.

# 7 Revision History

| Version | Date | Notes | Contributor(s) | Approver |
|---|---|---|---|---|
| 1.0 | 29 Sept 2022 | Initial Release | Chris Laplante | Dave Drogowski |
| 1.1 | 22 Aug 2023 | Added Lyra 24 and RM126x modules<br>Added section on rts/cts handshake | Erik Lins | Dave Drogowski |



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