Wolf Creek Power CPLD UART Multiplexor Hot Keys

The Wolf Creek Power CPLD has a UART Multiplexor (MUX) that can be used to create a connection between the microUSB connector on the backplate of the Controller canister and FTDI USB-to-UART converter to one of 16 UARTs within the canister. This MUX is controlled by the following registers

1. A nonvolatile register, URT\_INTERCONN\_SET, whose value can be changed by an IPMI command to the BMC which the BMC passes via I2C to the Power CPLD. URT\_INTERCONN\_SET defines the default UART setting. During manufacturing, URT\_INTERCONN\_SET is set to the value that selects the BMC UART (i.e., the main processor console).
2. A nonvolatile register, URT\_KEY\_DISABLE\_SET, whose value can be changed by an IPMI command to the BMC which the BMC passes via I2C to the Power CPLD. URT\_KEY\_DISABLE\_SET determines whether the URT\_KEY value should be ignored. During manufacturing URT\_KEY\_DISABLE\_SET is set to ENABLED.
3. A volatile register, URT\_KEY, whose value can be set by typing a key sequence on the terminal (or terminal emulator) connected to the microUSB connector. The Power-On-Reset value of URT\_KEY is DEFAULT.
4. A volatile register, URT\_KEY\_LOCK, whose value can be change by an I2C command from the Primary SAS Expander to the BMC which the BMC passes via I2C to the Power CPLD. URT\_KEY\_LOCK determines whether hot keys should modify URT\_KEY. The Power-On-Reset value of URT\_KEY\_LOCK is UNLOCKED.

using the following logic.

1. If URT\_KEY\_DISABLE\_SET is DISABLED then URT\_INTERCONN\_SET determines the MUX setting.
2. If URT\_KEY\_DISABLE\_SET is ENABLED and UART\_KEY is DEFAULT then URT\_INTERCONN\_SET determines the MUX setting.
3. If URT\_KEY\_DISABLE\_SET is ENABLED and URT\_KEY has a value other than DEFAULT then URT\_KEY determines the MUX setting.
4. If URT\_KEY\_LOCK is UNLOCKED and URT\_KEY\_DISABLE\_SET is ENABLED then URT\_KEY can be set with a 2-character control sequence starting with a CTRL-^ (ASCII RS) (CTRL-SHIFT-6 on a US keyboard) according to the table below.
   1. If a valid second character (per the table below) is typed within 3 seconds of the CTRL-^ then the Power CPLD will modify URT\_KEY and will not pass either character to the selected UART.
   2. If no character is typed within 3 seconds of the CTRL-^ or if an invalid character is typed after the CTRL-^ then the CTRL-^ and any invalid character typed within the 3 second window will be passed to the selected UART and URT\_KEY will not be modified.
   3. If CTRL-^ is typed twice within 3 seconds then a single CTRL-^ will be passed to the UART and URT\_KEY will not be modified.
5. If URT\_KEY\_LOCK is LOCKED or URT\_KEY\_DISABLE\_SET is DISABLED then URT\_KEY cannot be modified by hot keys and all characters are passed to the UART.

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| **UART Selected by MUX** | **Hot Key Sequence** | **ASCII Code Sequence** | **URT\_KEY Register Value** |
| DEFAULT (Select UART specified in URT\_INTERCONN\_SET) | <CTRL-^> + z | 0x1E + 0x7A | 0xFF |
| BMC UART (i.e., main processor console) | <CTRL-^> + a | 0x1E + 0x61 | 0 |
| BMC debug UART | <CTRL-^> + b | 0x1E + 0x62 | 1 |
| Primary SAS expender UART | <CTRL-^> + c | 0x1E + 0x63 | 2 |
| Secondary SAS expender UART | <CTRL-^> + d | 0x1E + 0x64 | 3 |
| PSoC debug UART | <CTRL-^> + e | 0x1E + 0x65 | 4 |
| SAS3008 #1 UART | <CTRL-^> + f | 0x1E + 0x66 | 5 |
| SAS3008 #2 UART | <CTRL-^> + g | 0x1E + 0x67 | 6 |
| SAS3008 #3 UART | <CTRL-^> + h | 0x1E + 0x68 | 7 |
| SAS3008 #4 UART | <CTRL-^> + i | 0x1E + 0x69 | 8 |
| SAS3008 #5 UART | <CTRL-^> + j | 0x1E + 0x6A | 9 |
| SAS3008 #6 UART | <CTRL-^> + k | 0x1E + 0x6B | 10 |
| SAS3008 #7 UART | <CTRL-^> + l | 0x1E + 0x6C | 11 |
| SAS3008 #8 UART | <CTRL-^> + m | 0x1E + 0x6D | 12 |
| SAS3008 #9 UART | <CTRL-^> + n | 0x1E + 0x6E | 13 |
| SAS3008 #10 UART | <CTRL-^> + o | 0x1E + 0x6F | 14 |
| SAS3008 #11 UART | <CTRL-^> + p | 0x1E + 0x70 | 15 |