Atlas2 QSFP-DD Host Adapter Card

User's Manual

REV: 1.0

Oct. 2022

# Atlas2 QSFP-DD Host Adapter Card

Function Description For Headers And Connecctors
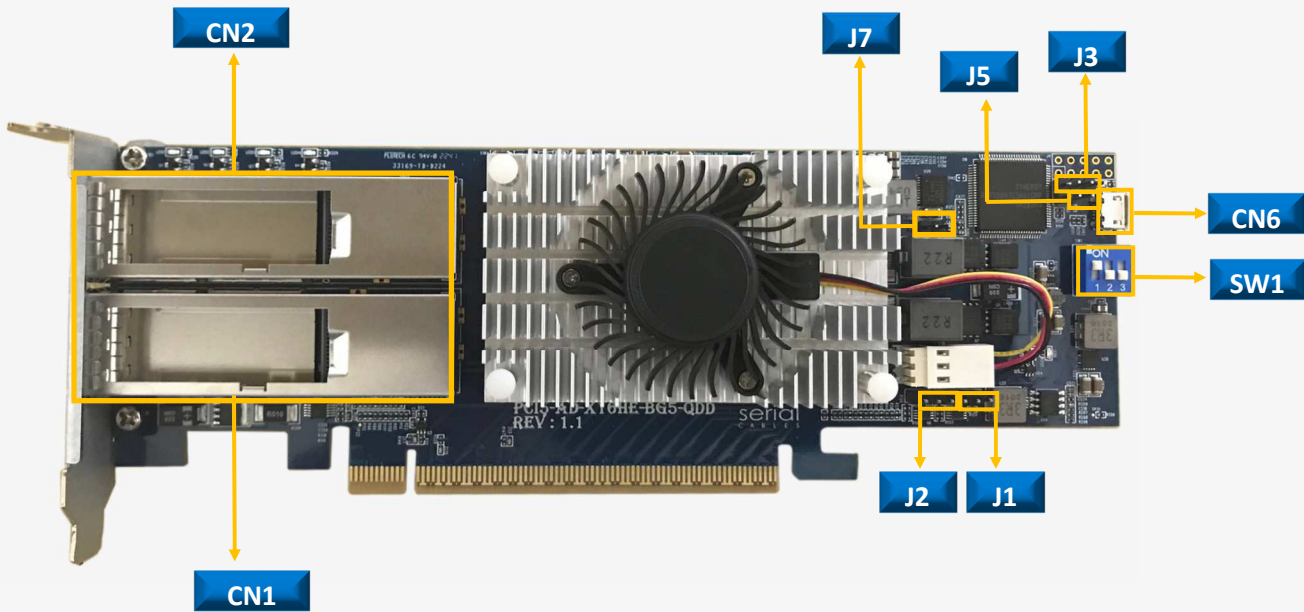
| Location	Descriptions	Pinout
J7	ON: MCU in FW upgrading mode OFF: MCU in normal operation mode (default)	
SW1	Pin 1 ON: MCU without SDB of switch control for debug purpose Pin 1 OFF: MCU is able to access switch information via SDB (default) Pin 2 and Pin 3 are reserved for further used	Pin 1/2/3
J5	ON: MCU in USB boot mode for FW programming OFF: MCU is normal operation (default)	
J1	Atlas2 switch SDB port. UART with 3.3V TTL signals level	TX/RX/GND
J2	Atlas2 switch UART port, require Atlas2 FW support UART with 3.3V TTL signals level	TX/RX/GND
J3	Reserved I/F for MCU FW debugging	
CN1/CN2	X8 QSFP-DD connectors	

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Function Description For LEDs
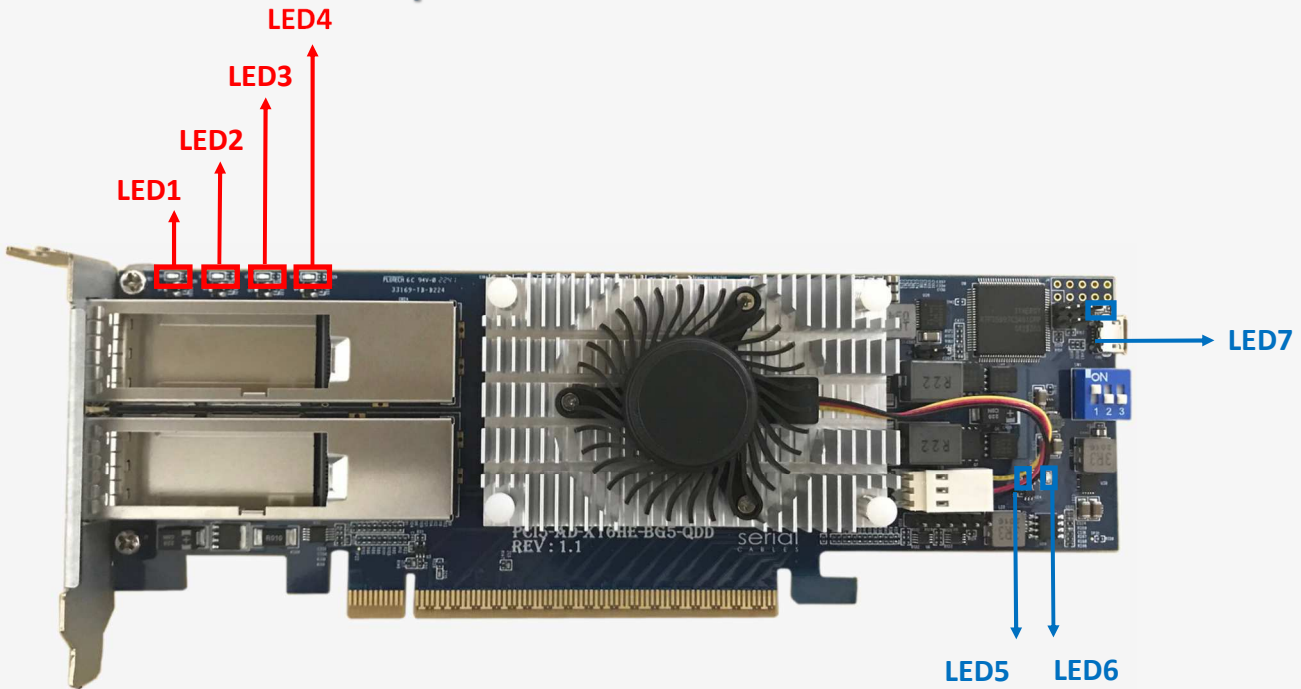
Location	Color	Description
LED7	Green	**System Healthy LED** 0.5Hz blinking for system good 2Hz blinking if any failure events detected, etc. voltages, FAN, and temperatures failed
LED6	Blue	**Atlas2 switch Heartbeat LED** Blinking: Indicates the Atlas2 switch working in Synthetic switch mode Solid ON: Indicates the Atlas2 switch working in base fanout switch mode
LED5	Red	**Atlas2 switch failure LED** Solid ON: indicates failure detected in Atlass switch
LED1/2/3/4	Red	**QSFP-DD Port link matching LEDs** Each LED corresponds to QSFP-DD ports. LED1 ON: QSFP-DD ports not link at x16 width LED1 OFF: QSFP-DD ports link at x16 width

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QSFP-DD Pins Definition
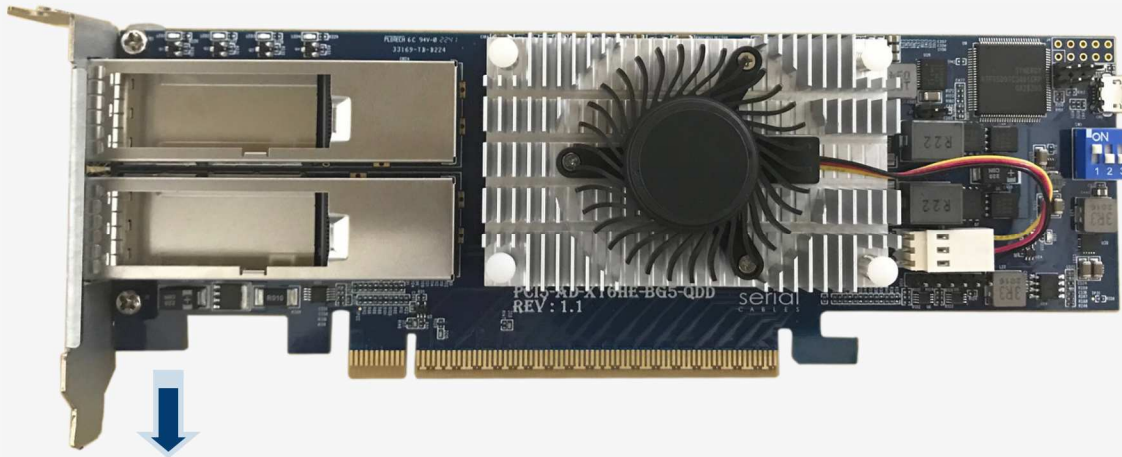
CON1	Pins	2/3	5/6	14/15	17/18	21/22	24/25	33/34	36/37
	Name	PETP1	PETP3	PERP2	PERP0	PERN1	PERN3	PETN2	PETN0
		PETN1	PETN3	PERN2	PERN0	PERP1	PERP3	PETP2	PETP0
	Pins	40/41	43/44	52/53	55/56	59/60	62/63	71/72	74/75
	Name	PETP5	PETP7	PERP6	PERP4	PERN5	PERN7	PETN6	PETN4
		PETN5	PETN7	PERN6	PERN4	PERP5	PERP7	PETP6	PETP4

CON2	Pins	2/3	5/6	14/15	17/18	21/22	24/25	33/34	36/37
	Name	PETP9	PETP11	PERP10	PERP8	PERN9	PERN11	PETN10	PETN8
		PETN9	PETN11	PERN10	PERN8	PERP9	PERP11	PETP10	PETP8
	Pins	40/41	43/44	52/53	55/56	59/60	62/63	71/72	74/75
	Name	PETP13	PETP15	PERP14	PERP12	PERN13	PERN15	PETN14	PETN12
		PETN13	PETN15	PERN14	PERN12	PERP13	PERP15	PETP14	PETP12

CON1 P11=RESET#_1(Propogate PERST# which sends from host server to QSFP-DD)

CON1 P12=PWRON_1 (Keep high state while QSFP-DD host card boots up)

CON2 P11=RESET#_2
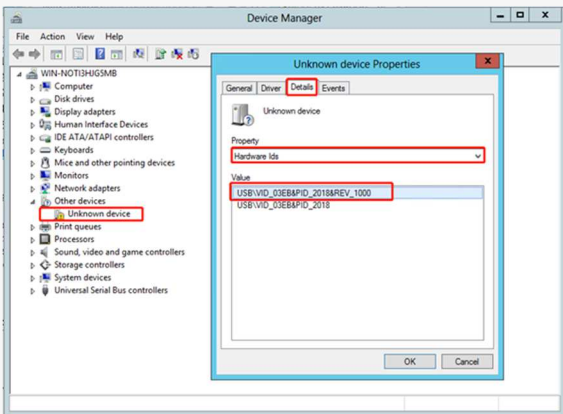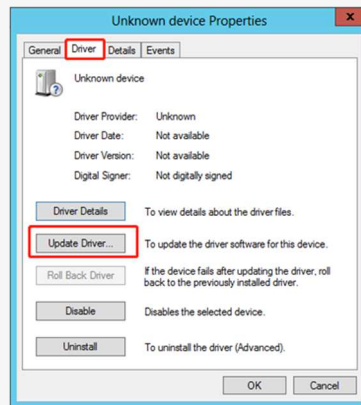
CON2 P12=PWRON_2

Install USB Driver

Download and install the CDC driver for unidentified device (VID_03EB&PID_2018)
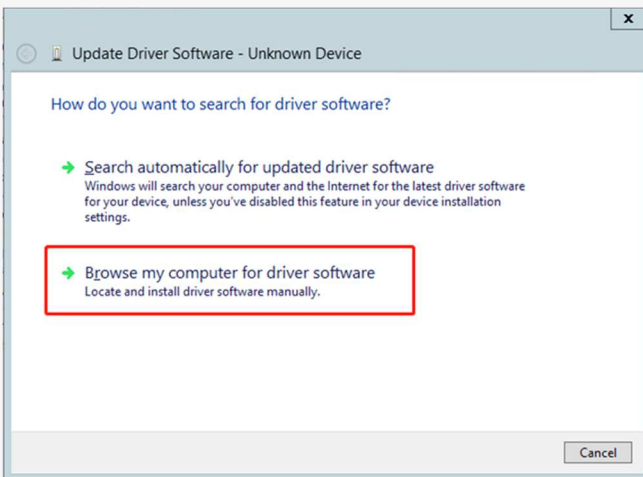
Available at:

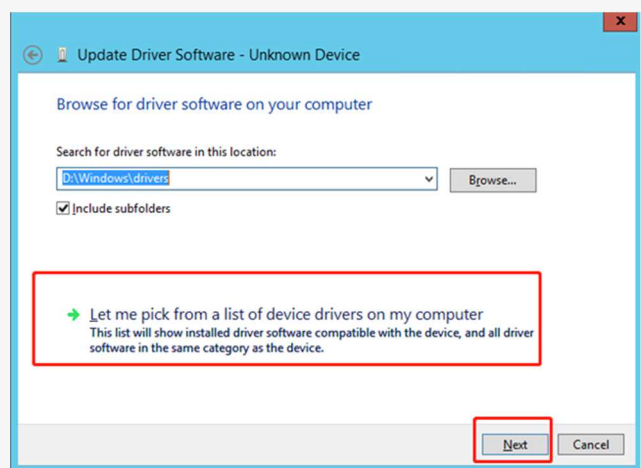https://www.serialcables.com/wp-content/uploads/2018/11/SynergyUSBCDC_20180518.rar
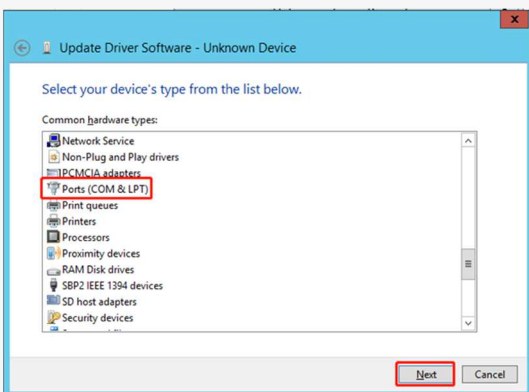

[Figure 1]

[Figure 2]
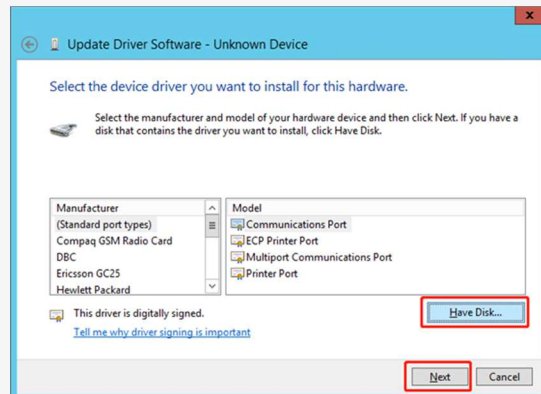

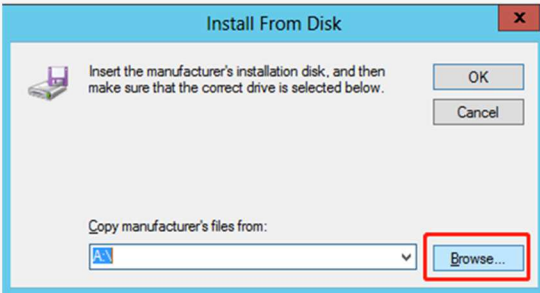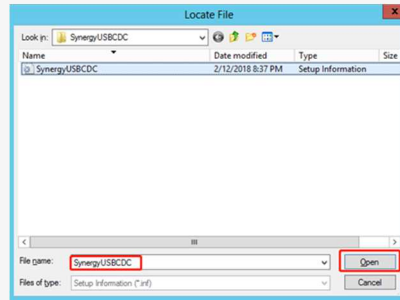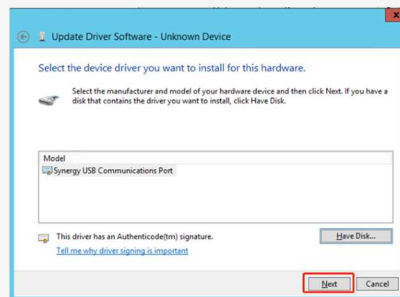**[Figure 3]**

[Figure 4]

[Figure 5]

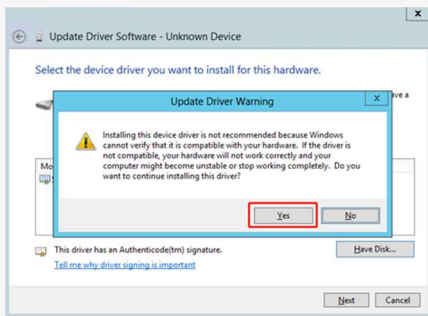**[Figure 6]**

[Figure 7]

[Figure 8]

[Figure 9]

[Figure 10]

[Figure 11]
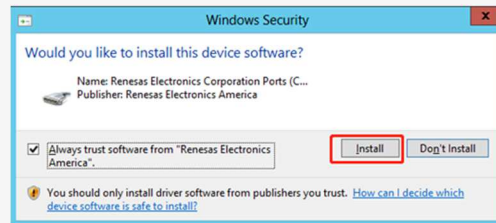
[Figure 12]
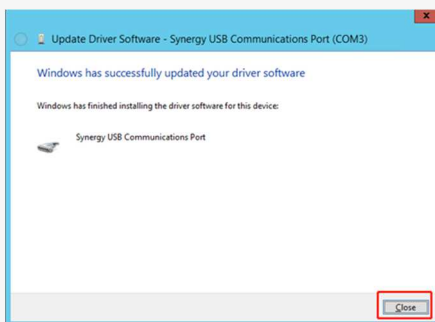
[Figure 13]
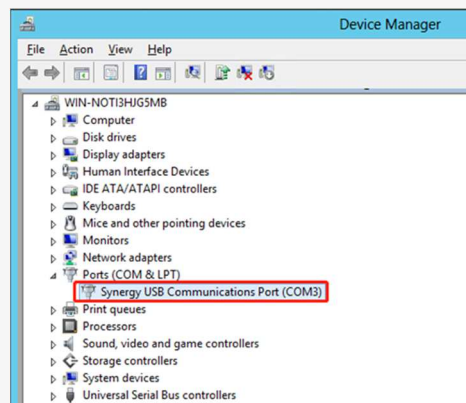
[Figure 14]

CLI Setup

Step 1. Install and launch Tera Term application

Step 2: To ensure proper communications between host adapter card

and the VT100 Terminal emulation, please configure the VT100 Terminal

emulation settings to the values shown below:
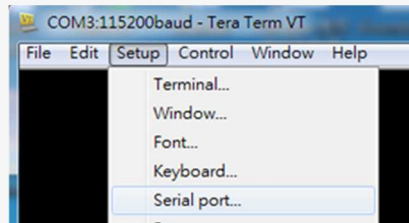
Step 3:

For "Port", select COM3 in this example. (Depend on which COM port used on Host)

For "Baud rate", select 115200.

For "Data", select 8 bit. For "Parity", select none.

For "Stop", select 1 bit. For "Flow control", select: none.
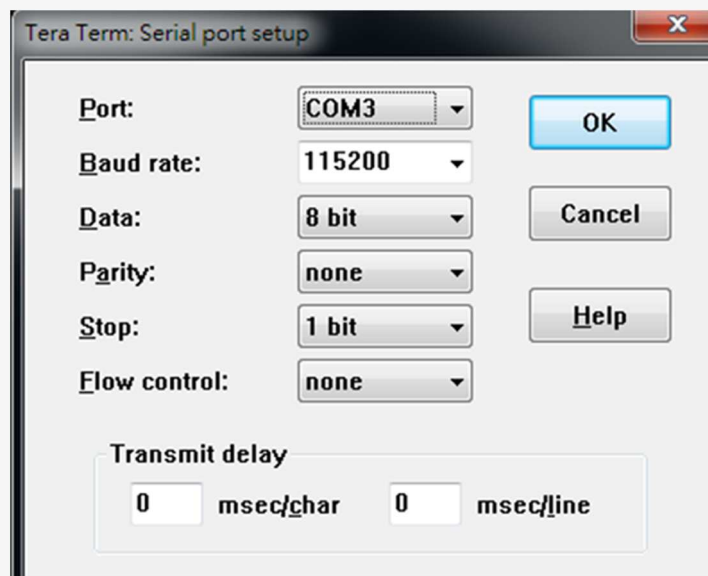
MCU FW Upgrading_Option1

Step 1. Jumper J7 ON to force MCU entering FW upgrading mode.

Connect to PC

J7
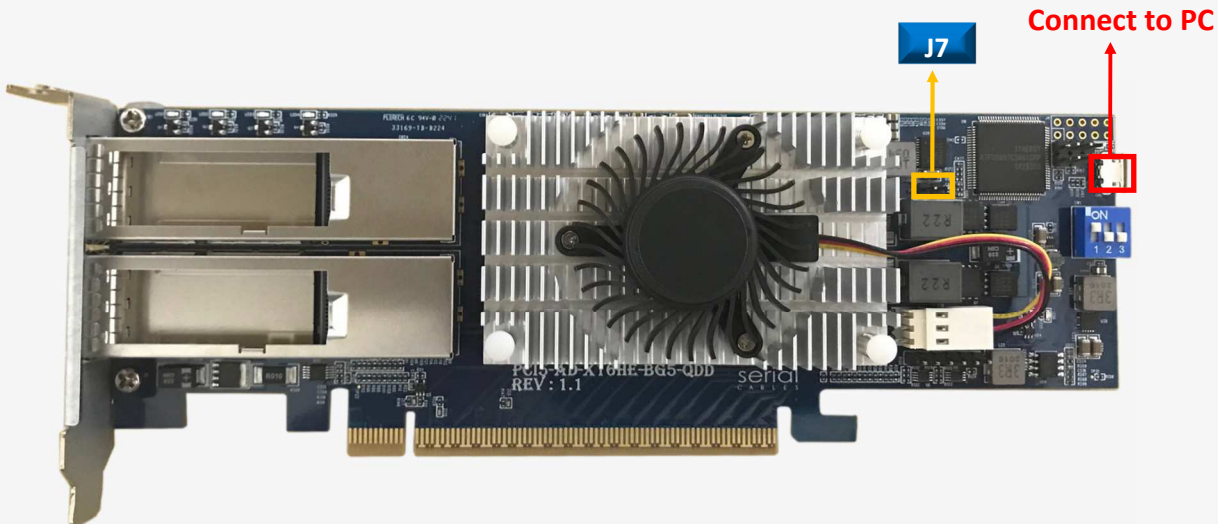
Step 2: Install host adapter card into PCIe slot of server, and connect Micro USB port to

PC which uses for FW upgrading, then power on the server.

Step 3.

a.) it will show an added USB device in PC or laptop.

b.) Put upgrading FW(i.e ATLAS2_QSFP_DD_FW_v001.srec) into the folder of FW.

c.) Put update.txt in the root folder.

Step 4. Power cycle host card to apply the new FW.

MCU FW Upgrading_Option2

Step 1. Type "fdl mcu" in CLI commands

Step 2: Sending updated FW(i.e ATLAS2_QSFP_DD_FW_v001.bin) via XMODEM.

It will take few seconds to complete update process.

Step 3. Power cycle host card to apply the new FW.

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MCU Commands List

Commands	Description
fdl	Update the configuration file or firmware for Atlas2 PCIe switch.
lsd	Shows switch temperature, host card consumed current, FAN speed, voltages and Side-band mode.
mw	Write 32bits data into any register as defined in Atlas2 switch
dr	Dump the values of Atlas2 switch for any register with specified address.
dp	Dump the values of Atlas2 switch for any register with specified port number.
df	Dump the values of Atlas2 flash with specified address.
showport	Show link status for USP in golden finger, DSP for QSFP-DD ports.
bist	On-board I2C devices diagnostic.
ver	Show card information, MCU FW and Atlas2 FW version.
sysinfo	Show QSFP-DD host card information.
reset	MCU FW reset (not including Atlas2 PCIe switch)

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fdl Command

Update the configuration file or firmware for Atlas2 PCIe switch.

-Usage: fdl sbr|fw|mfg

cfg=update the combined config file into MCU, then utilize "setmode" command to

select the bifurcation mode(x16/x8/x4/2)(Not support in QSFP-DD host card).

sbr=update the SBR file into flash of Atlas2 switch.

fw=program or upgrade FW into flash of Atlas2 switch (Not support in PCIe switch A0 chip).

mfg=update mfg file into flash of Atlas2 switch (Not support in PCIe switch A0 chip).

mcu=On-board MCU FW update, refer to page 9 for detail processes.

lsd Command

Shows switch temperature, host card consumed current, FAN speed and voltages.

-Usage: lsd

```
File   Edit   Setup   Control   Window   KanjiCode   Help
Cmd>lsd

Thermal:
      Switch Temperature :   44 degree
Fans Speed:
            Switch Fan :  3895   rpm
Atlas2 Card Current:
            12V Current :   1948   mA
Voltage Sensors:
          12V Voltage :   11861  mV
          1.8V Voltage :   1827   mV
          1.8AV Voltage :   1837   mV
          1.25V Voltage :   1288   mV
          0.8V Voltage :   838    mV
```

Thermal: The temperature sense near Atlas2 PCIe switch

Fan Speed: The TACH value reading for FAN.

Atlas2 card current: The P12V current reading for whole Atlas2 host card.

Voltage sensors: Main voltages monitor in Atlas2 host card.

mw Command

Write 32bits data into any register as defined in Atlas2 switch

-Usage: mw <register(H)> <data(H)>

-register(H) : register should be 0x00000000 ~ 0xFFFFFFFC

-data(H) : data should be 0x00000000 ~ 0xFFFFFFFF


```
File   Edit   Setup   Control   Window   KanjiCode   Help
mw fff0017c ffffffff
Cmd>
```

Write data "0xFFFFFFFF" into register address "0xFFF0017C" of Atlas2 PCIe switch

dr Command

Dump the values of Atlas2 switch for any register with specified address.

-Usage: dr <register<H> [count(H)]

-register(H) : register shoule be 0x00000000 ~ 0xFFFFFFFC

-count(H) : count should be 0x00000000 ~ 0xFFFFFFFC


```
File   Edit   Setup   Control   Window   KanjiCode   Help
Cmd>dr 60800000

60800000:c0301000  00100404  060400a0  00010010
60800010:00000000  00000000  000c0c0b  000001f1
60800020:0000fff0  0001fff1  00000000  00000000
60800030:00000000  00000040  00000000  00000100
60800040:c8034801  00000008  01b76805  fee00858
60800050:00000000  00000000  00000000  00000000
60800060:00000000  00000000  0162a410  00018004
60800070:00090010  007ae825  00010000  00000060
60800080:00001128  00000000  00000000  00150860
60800090:00000000  01803f3e  03000005  00000000
608000a0:00000000  0000000d  00481000  00000000
608000b0:00000000  00000000  00000000  00000000
608000c0:00000000  00000000  00000000  00000000
608000d0:00000000  00000000  00000000  00000000
608000e0:00000000  00000000  00000000  00000000
608000f0:00000000  00000000  00000000  00000000
```

Dump the values in Atlas2 switch registers, start from address "0x60800000".

```
File   Edit   Setup   Control   Window   KanjiCode   Help
Cmd>dr 60800000 4

60800000:c0301000
```

Dump the values in Atlas2 switch registers, start from address "0x60800000" with 4bytes count.

Atlas2 QSFP-DD Host Adapter Card

dp Command

Dump the values of Atlas2 switch for any register with specified port number.

-Usage: dp port_number(D)

-port_number(D) : port_number shoule be 0 ~ 95

```
File  Edit  Setup  Control  Window  KanjiCode  Help
Cmd>dp 0

60800000:c0301000  00100404  060400a0  00010010
60800010:00000000  00000000  000c0c0b  000001f1
60800020:0000fff0  0001fff1  00000000  00000000
60800030:00000000  00000040  00000000  00000100
60800040:c8034801  00000008  01b76805  fee00858
60800050:00000000  00000000  00000000  00000000
60800060:00000000  00000000  0162a410  00018004
60800070:00090010  007ae825  00010000  00000060
60800080:00001128  00000000  00000000  00150860
60800090:00000000  01803f3e  03000005  00000000
608000a0:00000000  0000000d  00481000  00000000
```

Dump the values in Atlas2 switch registers for Port "0".

Port Mapping
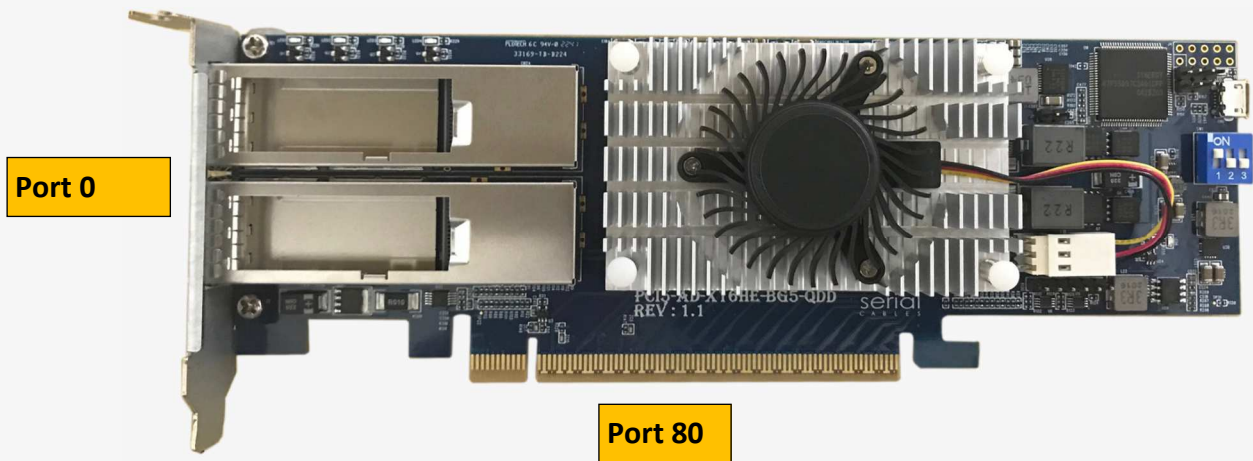
Note:

QSFP-DD supports 1x16 mode only.

df Command

Dump the values of Atlas2 flash with specified address.

-Usage: df address(H) [count(H)]

-address(D) : address shoule be 0x00000000 ~ 0xFFFFFFFC

-count(H) : count shoule be 0x00000000 ~ 0xFFFFFFFC

```
File   Edit   Setup   Control   Window   KanjiCode   Help
Cmd>df 400

00000400:3ba230c0  fc010000  50020000  00000000
00000410:01000000  4c040000  10000000  00000000
00000420:01000000  00000000  01000000  00000000
00000430:01000000  5c040000  10000000  00000000
00000440:01000000  00000000  01000000  00000000
00000450:01000000  00000000  01000000  00000000
00000460:01000000  00000000  01000000  6c040000
00000470:98030000  00000000  00000000  50449204
00000480:00000000  00000000  00000000  00000000
00000490:4c30808c  80000100  01000000  0a000000
000004a0:3c140128  071ebb00  00022807  00000000
000004b0:00000000  00ff3100  00000000  0000c029
000004c0:08f09fe5  00f020e3  00f020e3  08f09fe5
000004d0:00000000  00000000  00000000  00000000
000004e0:00000000  00000000  00000000  00000000
000004f0:00000000  00000000  00000000  00000000
```

Dump the values in Atlas2 flash registers, start from address "0x00000400".

```
File   Edit   Setup   Control   Window   KanjiCode   Help
Cmd>df 400 4

00000400:3ba230c0
```

Dump the values in Atlas2 flash registers, start from address "0x00000400" with 4bytes count.

showport Command

Show link status for USP in golden finger, Con0 for QSFP-DD ports .

-Usage: showport

Negotiated link width and speed   **Expected link width and speed**

bist Command

On-board I2C devices diagnostic.

- Usage: bist

Show all of on-board I2C devices for debug purpose.

ver Command

Shows card information, MQU FW and Atlas2 FW version.

-Usage: ver

Atlas2 Silicon A0 version supports Base Mode without Firmware.

sysinfo Command

Show QSFP-DD host card information. It is combined commands for "ver", "lsd", "showport" and "bist"

-Usage: sysinfo

```
File  Edit  Setup  Control  Window  KanjiCode  Help
Cmd>sysinfo

========================================================================
ver
========================================================================

S/N      : B5A022210020001
Company  : Serial Cables
Model    : ATLAS2 QSFP-DD HOST CARD
Version  : 0.0.1      Date : Oct 27 2022 15:16:27
========================================================================
Atlas2 Firmware Revision Information:-
========================================================================

Active Firmware:  unknown
Version : unknown
Platform: unknown


========================================================================
lsd
========================================================================


Thermal:
     Switch Temperature :  42 degree
Fans Speed:
          Switch Fan :  3928   rpm
Atlas2 Card Current:
          12V Current :  1777   mA
Voltage Sensors:
          12V Voltage :  11918 mV
          1.8V Voltage :  1822   mV
          1.8AV Voltage :  1832   mV
          1.25V Voltage :  1291   mV
          0.8V Voltage :  826    mV


========================================================================
showport
========================================================================



========================================================================
                         Upstream
========================================================================
USP: port 80, speed = Gen5, width = 16, max_speed = Gen5, max_width = 16
========================================================================
                         Downstream
========================================================================
Con0: port  0, speed = Gen1, width = 0, max_speed = Gen5, max_width = 16


========================================================================
bist
========================================================================


Scan I2C channel 0 devices ....
Device address:0xb0 ok.
```

Atlas2 QSFP-DD Host Adapter Card

reset Command

MCU FW reset (not including Atlas2 PCIe switch)

-Usage: reset