PCI4-AD-x16HE-MG4

MS X16 EXT Host Adapter Card

User's Manual

REV: 1.0

Jan. 2021

MS X16 EXT Host Adapter Card

Headers And Connectors
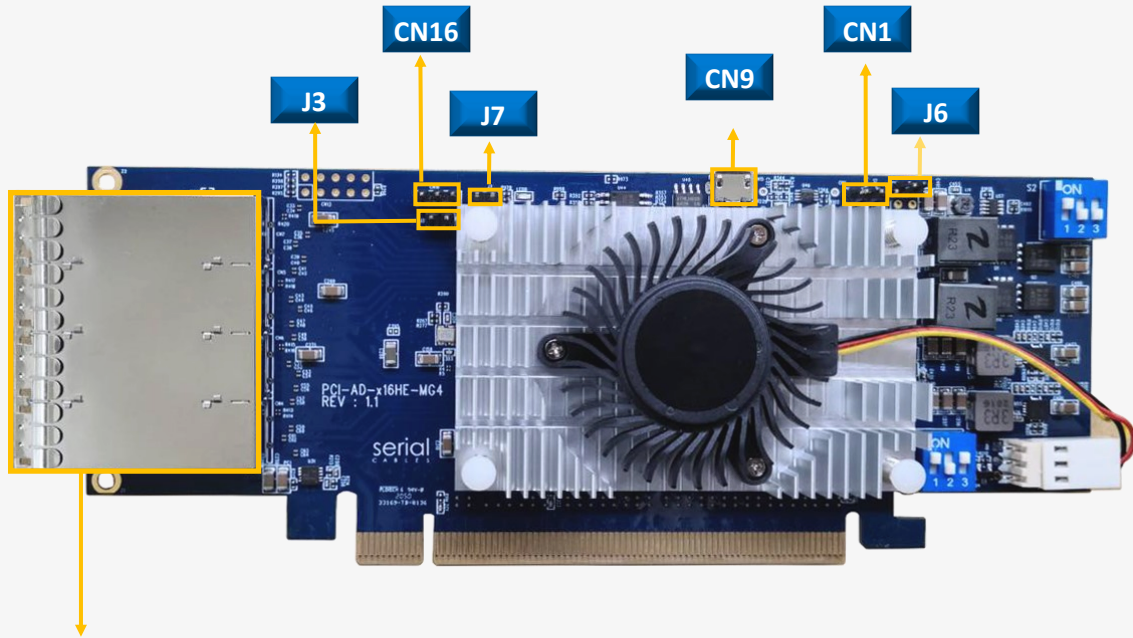
Quad Ports MiniSAS HD

SFF8674 connector

Headers	Description	Pinout
J6	ON: Force Switchtec entering boot recovery 1 OFF: Switchtec loading default FW image as normal operation (default)	
CN1	Switchtec UART I/F UART with 3.3V TTL signals level	TX/RX/GND
CN9	MicroUSB port for executing uP CLI commands	
J7	ON: uP in FW upgrading mode	
CN16	Reserved I/F for uP FW debugging	TX/RX/GND
J3	ON: ISP mode for uP FW programming OFF: uP in normal operation (default)	

Side-band Modes Selection
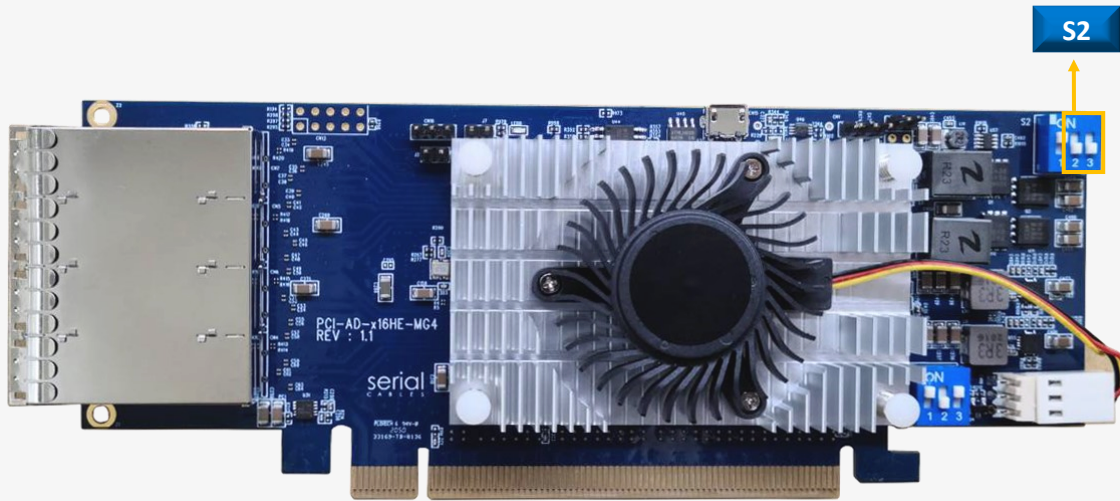
Switch Slide S2

POS 2| 3	Description
	Target mode and select Side-band mode to PCI-SIG in SFF8674 connectors (*)
	Host mode and select Side-band mode to PCI-SIG in SFF8674 connectors
	Host mode and select Side-band mode to SC in SFF8674 connectors

Side-band mode		
	PCI-SIG	**SC**
A1	CADDR	CLK_0_N
A2	CABLE_INT#	CLK_0_P
B1	VCT(NC)	CLK_1_N
B2	CABLE_PRE#	CLK_1_P
C1	CMI_SCL	CMI_SCL
C2	CMI_SDA	CMI_SDA
D1	VACT	PERST#_0
D2	VMAN	PERST#_1

*Note: Target mode support in Port bifurcation mode 9 with PCI-SIG side band mode

MS X16 EXT Host Adapter Card
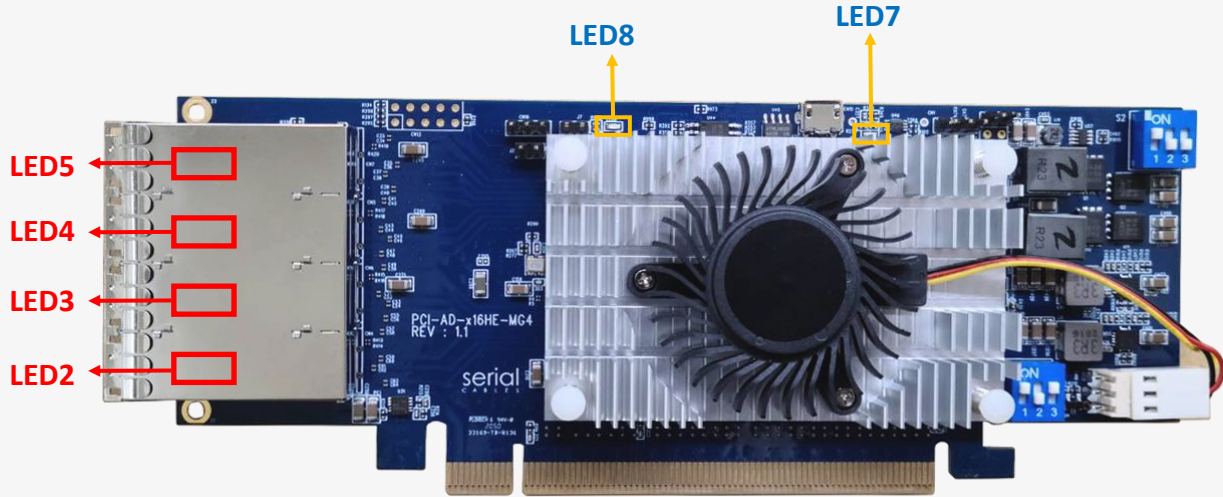
Bifurcation Modes Selection

Switch Slide S1 and S2

S2 POS 1	S1 POS 1|2|3	Mode	Host/ Target	Description
		1		**SRNS**: Set SFF8674 to one x16 link
		2		**SRNS**: Set SFF8674 to Two x8 link
		3		**SRNS**: Set SFF8674 to Four x4 link
		4		**SRNS**: Set SFF8674 to Eight x2 link
		5	Host	**SRIS**: Set SFF8674 to one x16 link
		6		**SRIS**: Set SFF8674 to Two x8 link
		7		**SRIS**: Set SFF8674 to Four x4 link
		8		**SRIS**: Set SFF8674 to Eight x2 link
		9	Target	**SRIS**: Set SFF8674 to one x16 link

Function Description For LEDs

Location	Color	Description
LED7	**Blue**	**Switchtec Heartbeat LED** Blinking: Indicates Switchtec loading firmware successfully and working correctly
LED8	**Green**	**System Healthy LED** 0.5Hz blinking for system good 2Hz blinking if any failure events detected, etc. voltages, FAN, and temperatures failed

LED 5/4/3/2	**Red**	**Link matching LED for ports in SFF8674 connectors**
		Case 1: set in mode 1, 5 or 9
		    LED1 lights when port in SFF8674 not link at x16.
		Case 2: set in mode 2 or 6
		    LED5 or/and LED3 light when ports in SFF8674 not link at x8
		Case 3: set in mode 3,4,7 or 8
		    LED5, LED4, LED3 or/and LED2 light when ports in SFF8674 not link at x4 or 2x2

MS X16 EXT Host Adapter Card

SFF8674 Pin Definition (SC mode)

	ROW	Column					
		1	2	4	5	7	8
CONN_0	A	CLK_3_N	CLK_3_P	PERP0	PERN0	PERP3	PERN3
	B	CLK_7_N	CLK_7_P	PERP1	PERN1	PERP2	PERN2
	C	I2C_SCL_4	I2C_SDA_4	PETP0	PETN0	PETP3	PETN3
	D	PERST#_6	PERST#_7	PETP1	PETN1	PETP2	PETN2
CONN_1	A	CLK_2_N	CLK_2_P	PERP4	PERN4	PERP7	PERN7
	B	CLK_6_N	CLK_6_P	PERP5	PERN5	PERP6	PERN6
	C	I2C_SCL_3	I2C_SDA_3	PETP4	PETN4	PETP7	PETN7
	D	PERST#_4	PERST#_5	PETP5	PETN5	PETP6	PETN6
CONN_2	A	CLK_1_N	CLK_1_P	PERP8	PERN8	PERP11	PERN11
	B	CLK_5_N	CLK_5_P	PERP9	PERN9	PERP10	PERN10
	C	I2C_SCL_2	I2C_SDA_2	PETP8	PETN8	PETP11	PETN11
	D	PERST#_2	PERST#_3	PETP9	PETN9	PETP10	PETN10
CONN_3	A	CLK_0_N	CLK_0_P	PERP12	PERN12	PERP15	PERN15
	B	CLK_4_N	CLK_4_P	PERP13	PERN13	PERP14	PERN14
	C	I2C_SCL_1	I2C_SDA_1	PETP12	PETN12	PETP15	PETN15
	D	PERST#_0	PERST#_1	PETP13	PETN13	PETP14	PETN14

USB Driver Installation

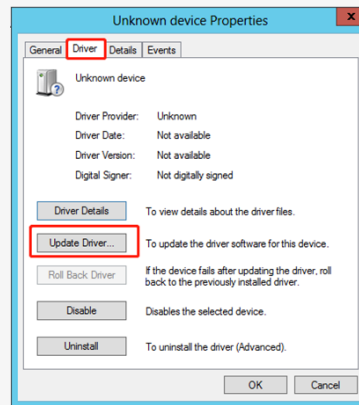Download and install the CDC driver for unidentified device (VID_03EB&PID_2018)

Available at:

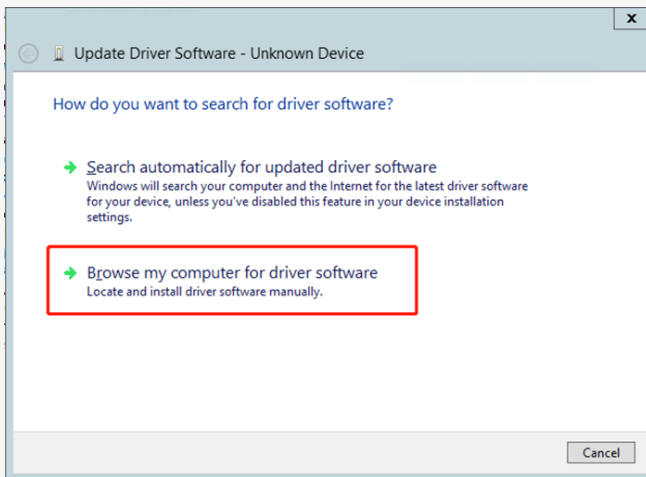https://www.serialcables.com/wp-content/uploads/2018/11/SynergyUSBCDC_20180518.rar
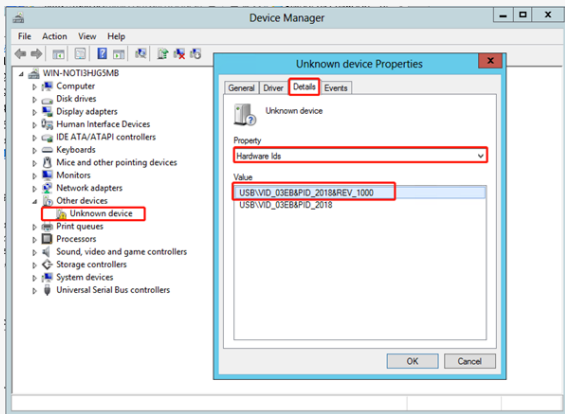
Note:

[Figure 1]

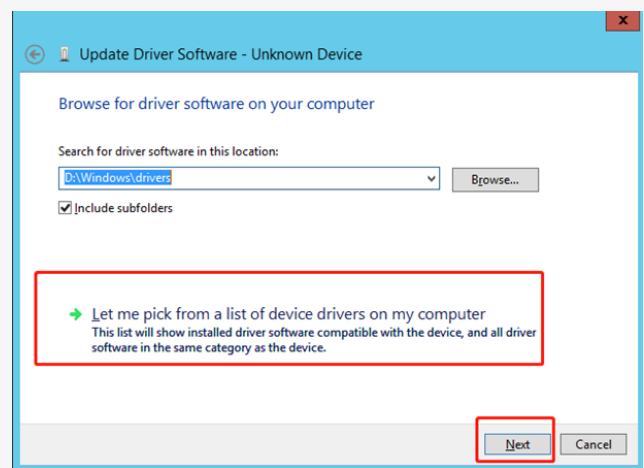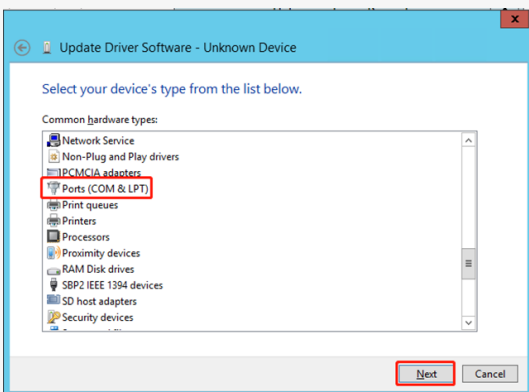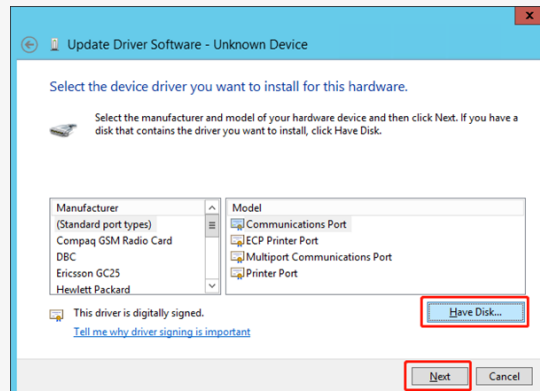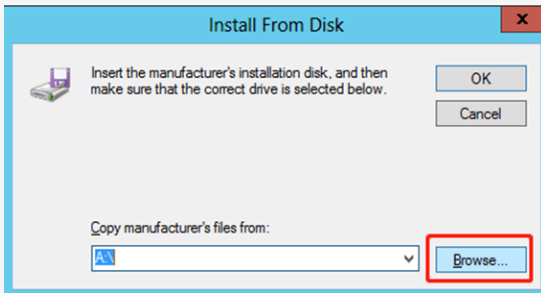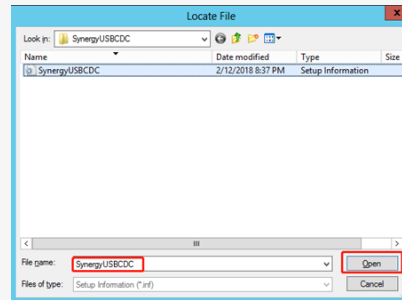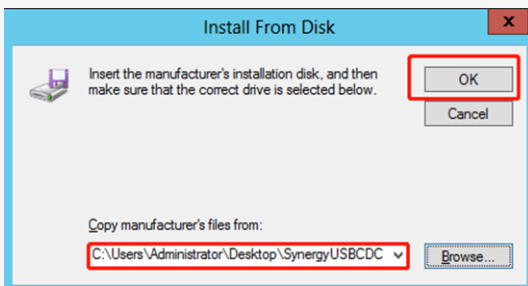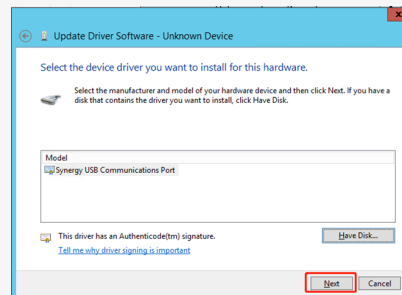No USB driver is

[Figure 2]

[Figure 3]

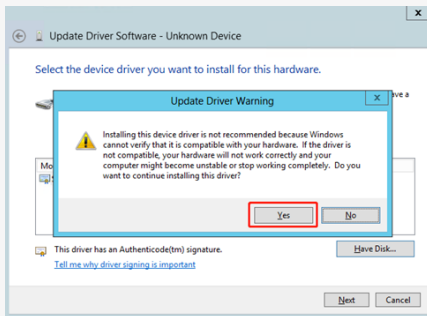[Figure 4]

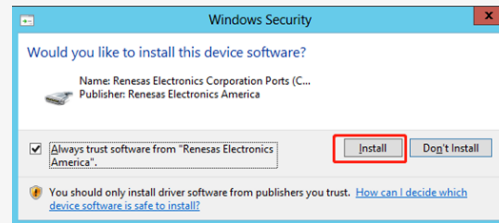[Figure 5]

[Figure 6]

[Figure 7]

[Figure 8]

[Figure 9]

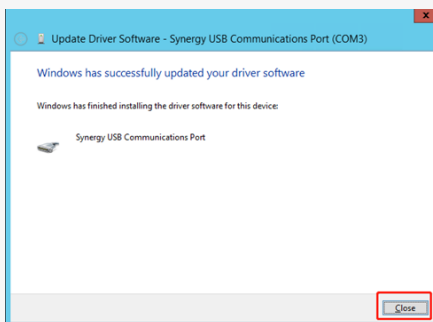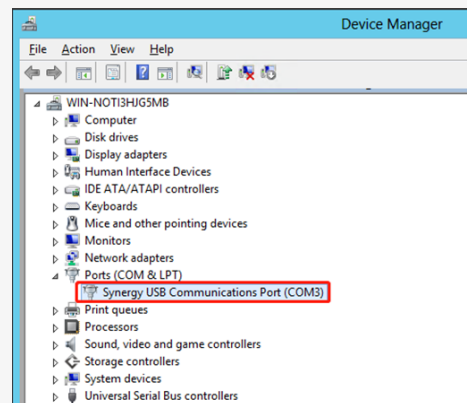[Figure 10]

[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:
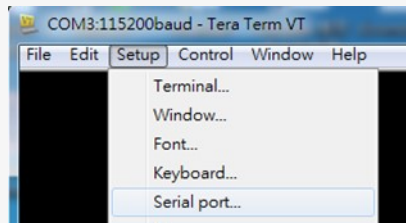
Step 3:

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.

FW Upgrading

Step 1. Have jumper J7 ON to force uP entering FW upgrading mode.

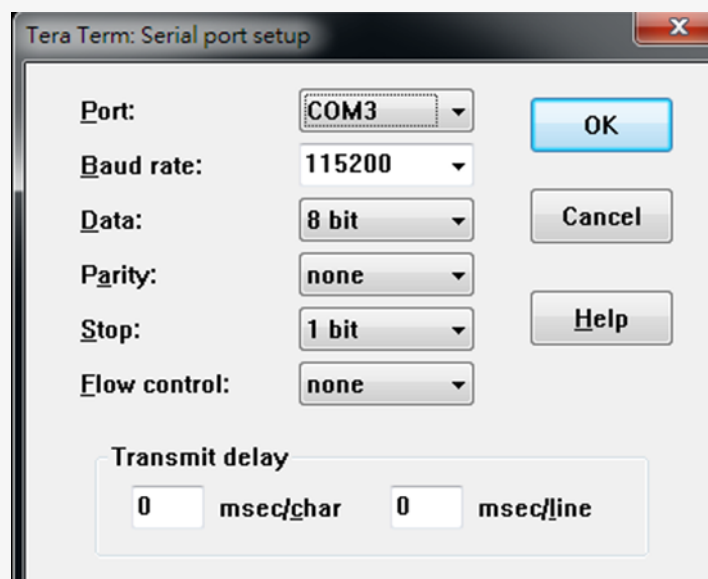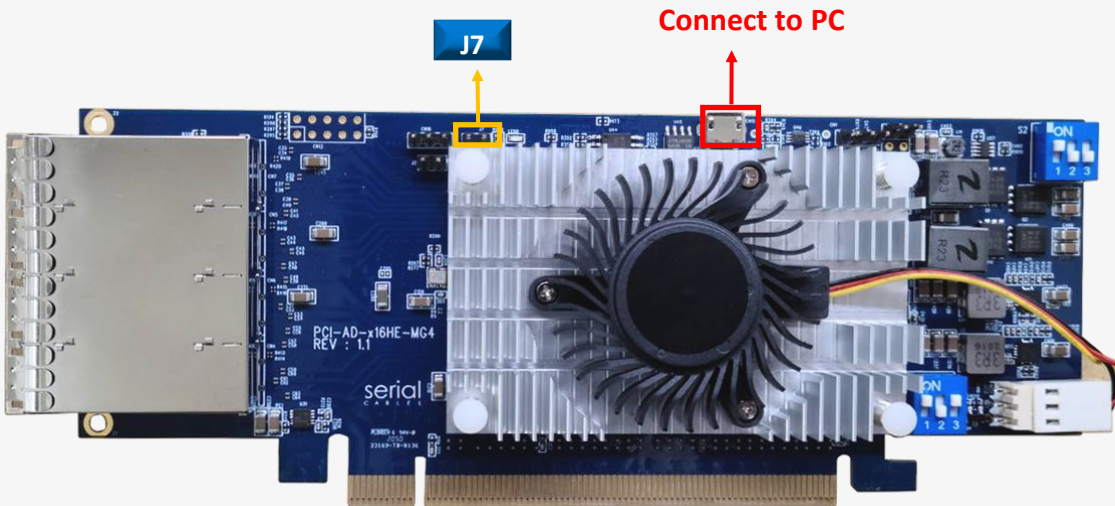
Step 2: Install host adapter card into PCIe slot of server, and connect Micro USB port to

PC which used 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 us_ms_external_host_card_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.

![serial CABLES logo] **MS X16 EXT Host Adapter Card**

Commands List

```
File   Edit   Setup   Control   Window   KanjiCode   Help

Cmd>help
  Cmd Help Menu
    fdl :
          Xmodem download image.
          - Usage: fdl <fw>
          - fw  : update fw into switch.

    lsd :
           Show environmental conditions information.
          - Usage: lsd

    ssdrst :
          Reset con.
          - Usage: ssdrst <con(D)|all> [channel(C)]
          - con(D) : con number should be 0 ~ 4
          - channel(C) : channel should be a or b
          - Ex: ssdrst 1
          - Ex: ssdrst 1 a
          - Ex: ssdrst all
          - Ex: ssdrst all a

    showport :
          Display link speed and link width information.
          - Usage: showport

    showmode :
          Show mode information of Switchtec port bifurcation.
          - Usage: showmode

    scan :
          Scan device of i2c bus.
          - Usage: scan

    clk :
          Set PCIe clock output enable.
          - Usage: clk [en|dis]

    iicwr :
          iicwr <Addr(H)> <Con(D)> <ReadByte(D)> <WriteData(H)>
          - Addr(H) : Device address
          - Con(D) : Con should be 1 ~ 4
          - ReadByte(D) : Max read byte is 32 byte
          - WriteData(D) : Max write byte is 32 byte
          - Ex : iicwr d4 1 8 0

    iicw :
          iicw <Addr(H)> <Con(D)> <WriteData(H)...>
          - Addr(H) : Device address
          - Con(D) : Con should be 1 ~ 4
          - WriteData(D) : Max write byte is 32 byte
          - Ex : iicw d4 1 ff

    ver :
          Show microcontroller firmware version.
          - Usage: ver

    toggle :
          Toggle firmware and config partitions.
          - Usage: toggle

    reset :
          System reset.
          - Usage: reset
```

fdl Command

Update the configuration file or firmware for Microchip Switchtec switch.

Usage: fdl fw

lsd Command

Shows temperatures, FAN speed, voltages, and side-band mode support.

Usage: lsd

ssdrst Command

Issue PERST# from uP to device
-Usage: ssdrst <con(D)|all> [channel(C)]

con(D) : con number should be 0 ~ 4

channel(C) : channel number should be a or b

Channel a: The 1st PHY of dual port drive

Channel b: The 2nd PHY of dual port drive

CON1
CON2
CON3
CON4

CON0

```
File   Edit   Setup   Control   Window   KanjiCode   Help
Cmd>ssdrst 1
Reset con 1 success
Cmd>
```

```
File   Edit   Setup   Control   Window   KanjiCode   Help
Cmd>ssdrst 1 a
Reset channel a of con 1 success
Cmd>
```

```
File   Edit   Setup   Control   Window   KanjiCode   Help
Cmd>ssdrst all
Reset all con success
Cmd>
```

```
File   Edit   Setup   Control   Window   KanjiCode   Help
Cmd>ssdrst all b
Reset channel b of all con success
Cmd>
```

showport Command

Shows ports link speed and link width information.
Usage: showport

Mode 1 or 5

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

Host mode
================================================================
UPS: Con 0: speed = Gen3, width = 16, max_width = 16
================================================================
DSP: Con 1: speed = Gen1, width = 0, max_width = 16
```

Mode 2 or 6

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

Host mode
================================================================
UPS: Con 0: speed = Gen3, width = 16, max_width = 16
================================================================
DSP: Con 1: speed = Gen1, width = 0, max_width = 8
DSP: Con 3: speed = Gen1, width = 0, max_width = 8
```

Mode 3 or 7

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

Host mode
================================================================
UPS: Con 0: speed = Gen3, width = 16, max_width = 16
================================================================
DSP: Con 1: speed = Gen1, width = 0, max_width = 4
DSP: Con 2: speed = Gen1, width = 0, max_width = 4
DSP: Con 3: speed = Gen1, width = 0, max_width = 4
DSP: Con 4: speed = Gen1, width = 0, max_width = 4
```

Mode 4 or 8

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

Host mode
================================================================
UPS: Con 0: speed = Gen3, width = 16, max_width = 16
================================================================
DSP: Con 1_A: speed = Gen1, width = 0, max_width = 2
DSP: Con 1_B: speed = Gen1, width = 0, max_width = 2
DSP: Con 2_A: speed = Gen1, width = 0, max_width = 2
DSP: Con 2_B: speed = Gen1, width = 0, max_width = 2
DSP: Con 3_A: speed = Gen1, width = 0, max_width = 2
DSP: Con 3_B: speed = Gen1, width = 0, max_width = 2
DSP: Con 4_A: speed = Gen1, width = 0, max_width = 2
DSP: Con 4_B: speed = Gen1, width = 0, max_width = 2
```

Mode 9

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

Target mode
================================================================
DSP: Con 0: speed = Gen1, width = 16, max_width = 16
================================================================
UPS: Con 1: speed = Gen1, width = 0, max_width = 16
```

Showmode

Shows port bifurcation mode, support up to 6 modes.
Usage: showmode

Scan Command

Scan all I2C devices in MS Slim host card
Usage: scan

clk Command

Show the clock output status or disable the clock output for all downstream ports.
Usage: clk

Usage: clk dis/en
Clock output disable/enable feature is dynamically changing, without card reset or power cycle.

iicwr Command

Data read for drives from SMbus

Usage: iicwr <Addr(H)> <Slot(D)> <ReadByte(D)> <WriteData(H)>

- Addr(H) : Device address

- con(D) : con should be 1 ~ 4

- ReadByte(D) : Max read byte is 32 byte

- WriteData(D) : Max write byte is 32 byte

- Ex : iicwr d4 1 8 0

```
File   Edit   Setup   Control   Window   KanjiCode   Help
Cmd>iicwr d4 1 8 0

Data [0] = 6
Data [1] = 7b
Data [2] = 1f
Data [3] = 1a
Data [4] = 0
Data [5] = 0
Data [6] = 0
Data [7] = 26
```

iicw Command

Byte or page write data to drives from SMbus

Usage: iicw <Addr(H)> <Slot(D)> <WriteData(H)>

- Addr(H) : Device address

- con(D) : con should be 1 ~ 4

- WriteData(D) : Max write byte is 32 byte

- Ex : iicw d4 1 ff

```
File   Edit   Setup   Control   Window   KanjiCode   Help
Cmd>iicw d4 1 ff

Write Data [0] = ff
```

ver Command

Shows card information, S/N, uP FW and PCIe switch Switchtec FW version.
Usage: ver

toggle Command

Toggle firmware and config partitions

Usage: reset

reset Command

Reset uP FW
Usage: reset