

USB board supported binary commands

Configuration jumpers for USB board

JP1 off = 9600 baud
JP1 on = 19200 baud

System and Version	JP2	JP3	JP4	Version reported
Power Cab v1.28	-	-	-	6.3.0
SB3 v1.28	-	-	ON	6.3.1
PH Pro 2007	-	ON	-	6.3.2
ALLSYS	-	ON	ON	6.3.3

Future Versions

Power Cab v1.61	ON	-	-	6.3.4
SB3 v1.61	ON	-	ON	6.3.5
unused	ON	ON	-	6.3.6
unused	ON	ON	ON	6.3.7

Notes:

- SB3 v1.61 and PowerCab v1.61 will be the next released versions. These versions will not be released for at least a year (I'm not even working on them yet). The version number was picked so that I could have a definitive number to work with for NCE internal system documentation.
- ALLSYS means the USB board passes all commands supported by the USB board (useful when we get bug free DCC systems)
- The third byte returned by the version command (0xaa) is the complemented, bit-reversed status of jumpers 2,3 and 4 (see table above).
- Jumpers matching the system/version table above MUST be installed for proper operation. Some commands are massaged by the USB board to accommodate bugs in different devices so the board needs to know what system it is connected to by reading the jumpers.
- The USB board forces the cab bus address to 3 when used with a PowerCab.
- The USB board cab bus address is read only at power up. All board power comes from the cab bus connection so the board must be power cycled via unplugging from the cab bus if the address is changed.
- Cab bus addresses for the SB3 are limited to a range of 2 through 5.
- Data rates >19200 baud are not supported due to limitations of the optoisolator on the USB board.
- Multiple USB boards may be used with a system (except Power Cab) for control by multiple computers. Each USB board must have a different cab address ranging from 2 to 63.
- When installing the USB board for the first time Windows XP automatically find the correct driver on the Internet (if you tell it to search for the driver)

or

You can download USB drivers for the board from:
www.silabs.com/tgwWebApp/public/web_content/products/Microcontrollers/USB/en/mcu_vcp.htm

Technical stuff follows on remaining pages

Commands supported by PowerCab-1.28 (no jumpers)

Hex	Bytes	Description
0x80	1 bytes	NOP... just returns '!
0x8C	1 bytes	Returns !,CR,LF
0x9C	2 bytes	Execute route macro
0x9E	1 bytes	Enter program track mode
0x9F	1 bytes	Exit program track mode
0xA0	4 bytes	Write a CV in paged mode
0xA1	3 bytes	Read a CV in paged mode
0xA2	5 bytes	Locomotive control command
0xA6	3 bytes	Write in register mode
0xA7	2 bytes	Read in register mode
0xA8	4 bytes	Write in direct mode
0xA9	3 bytes	Read in direct mode
0xAA	1 bytes	Return C/S software version (USB board = 6.3.x - see table for value of x)
0xAD	5 bytes	Accy/signal/macro commands (NOTE: accy/sig addresses limited to range of 1-250)
0xAE	6 bytes	Locomotive OPs program byte
0xAF	6 bytes	Accy/Signal OPs program byte (NOTE: accy/sig addresses limited to range of 1-250)
0xB0	5 bytes	reserved - factory test
0xB1	2 bytes	Set cab address of USB device (Cab address always forced to 3 when configured for Power Cab)

Notes: jumpers MUST be installed to match

Commands supported by SB3-1.28 -jumper 4 (only) on

Hex	Bytes	Description
0x80	1 bytes	NOP... just returns '!
0x8C	1 bytes	Return !,CR,LF
0x9C	2 bytes	Execute route macro
0xA2	5 bytes	Locomotive control command
0xAA	1 bytes	Return C/S software version
0xAD	5 bytes	Accy/signal/macro commands (NOTE: accy/sig addresses limited to range of 1-250)
0xAE	6 bytes	Locomotive OPs program byte
0xAF	6 bytes	Accy/Signal OPs program byte (NOTE: accy/sig addresses limited to range of 1-250)
0xB0	5 bytes	reserved - factory test
0xB1	2 bytes	Set cab address of USB device

Commands supported by Power Pro 2007 version -jumper 3 (only) on

Hex	Bytes	Description
0x80	1 bytes	NOP... just returns '!
0x8C	1 bytes	Returns !,CR,LF
0x9C	2 bytes	Execute route macro
0xA2	5 bytes	Locomotive control command
0xAA	1 bytes	Return C/S software version
0xAD	5 bytes	Accy/signal/macro commands (no limit on accy/sig addresses)
0xAE	6 bytes	not supported due to bug in command station software
0xAF	6 bytes	not supported due to bug in command station software
0xB0	5 bytes	reserved - factory test
0xB1	2 bytes	Set cab address of USB device (this command only works internally to the USB interface it does not get to the command station)

Commands supported by ALLSYS - jumpers 3,4 (only) on

Hex	Bytes	Description
0x80	1 bytes	NOP... just returns '!'
0x8C	1 bytes	Returns !,CR,LF
0x9C	2 bytes	Execute route macro
0x9E	1 bytes	Enter program track mode
0x9F	1 bytes	Exit program track mode
0xA0	4 bytes	Write a CV in paged mode
0xA1	3 bytes	Read a CV in paged mode
0xA2	5 bytes	Locomotive control command
0xA6	3 bytes	Write in register mode
0xA7	2 bytes	Read in register mode
0xA8	4 bytes	Write in direct mode
0xA9	3 bytes	Read in direct mode
0xAA	1 bytes	Return C/S software version
0xAD	5 bytes	Accy/signal/macro commands
0xAE	6 bytes	Locomotive OPs program byte
0xAF	6 bytes	Accy/Signal OPs program byte
0xB0	5 bytes	reserved - factory test
0xB1	2 bytes	Set cab address of USB device (this command only works internally to the USB Interface it does not get to the command station)

Unsupported commands

The following commands are completely unsupported by the current version of the USB board. The USB board will buffer the expected number of bytes then return ASCII '0' indicating the command is not supported.

0x81 - 0x8B
0x8D - 0x9B
0x9D
0xA3
0xA4
0xA5
0xAB
0xAC
0xB2 - 0xBF

A list of the expected number of bytes for ALL binary commands

0x80 - 1
0x81 - 4
0x82 - 1
0x83 - 1
0x84 - 1
0x85 - 3
0x86 - 2
0x87 - 2
0x88 - 3
0x89 - 1
0x8A - 2
0x8B - 1
0x8C - 1

0x8D - 4
0x8E - 20 decimal
0x8F - 3

0x90 - 18 decimal
0x91 - 18 decimal
0x92 - 10 decimal
0x93 - 5
0x94 - 6
0x95 - 7
0x96 - 8
0x97 - 4
0x98 - 5
0x99 - 7
0x9A - 11 decimal
0x9B - 2
0x9C - 2
0x9D - 3
0x9E - 1
0x9F - 1

0xA0 - 4
0xA1 - 3
0xA2 - 5
0xA3 - 4
0xA4 - 5
0xA5 - 6
0xA6 - 3
0xA7 - 2
0xA8 - 4
0xA9 - 3
0xAA - 1
0xAB - 1
0xAC - 1
0xAD - 5
0xAE - 6
0xAF - 6

0xB0 - 5
0xB1 - 2
0xB2 - 0xBF 1 byte