Command Line Interface on the DP8200x

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Purpose

This specification defines the serial command line streams for controlling an InFocus projector through the RS232 connector to the projector. These commands are intended to provide a simple set of controls to the projector through what InFocus calls the Command Line Interface (CLI). The CLI is designed for use by what the industry commonly calls *boardroom controllers*. The CLI will accept commands via RS232 to control the necessary features used by most boardroom controllers. This CLI language uses a simple human readable protocol to help facilitate the installers' time necessary to setup or diagnose a problem with boardroom control installations. However, the CLI is not a guaranteed delivery system.

Message Format

As commonly used in math notation, everything is evaluated in the parenthesis first, as the parentheses are designed to group things together. This same parenthesis nomenclature is used to group a command and its data together (nested parenthesis are not supported). All commands are three alpha characters followed by the request. The request can be a "?" symbol that signifies a read request, or a numerical number represented by 1 to 4 ASCII digits, that signifies a write request. Not all commands support reading and writing. The command table indicates the commands and requests that are supported.

Write Commands

Write commands have the following format:

(AAA####) where,

(- starts the CLI command
AAA - denotes the CLI function
- denotes the value to be written (leading zeros are not necessary)
) - ends the CLI command

Some functions have ranges for settings while others are Boolean. Settings with ranges range from zero to a maximum number. If a number greater than the maximum is received, it is automatically limited to the maximum number for that function. IT IS SUGGESTED THAT EACH FUNCTION BE QUERIED FOR ITS RANGE WITH A READ COMMAND BEFORE ISSUING A WRITE COMMAND. Boolean settings consider 0 as off and 1-9999 as on. The only exception is the Power command. The only valid write values that will be accepted will be '0' for turning the power off and '1' for turning the power on.

Examples:

Brightness Command	(BRT10)	Sets the brightness to 10
Volume Command	(VOL0000)	Set the volume to 0
Freeze Command	(FRZ1)	Freeze the display
Freeze Command	(FRZ9999)	Freeze the display
Power Command	(PWR0)	Turn power off
Power Command	(PWR1)	Turn power on
Power Command	(PWR9999)	Command not recognized

Increment Commands

Increment commands have the following format:

(AAA+####) where,

(- starts the CLI command

AAA - denotes the CLI function
+ - denotes Increment command
- Is optional and denotes number of steps to be incremented (leading zeros are not necessary)
) - ends the CLI command

Examples:

Brightness Command	(BRT+10)	Increment brightness 10 steps
Brightness Command	(BRT+)	Increment brightness 1 step

Decrement Commands

Increment commands have the following format:

(AAA-####) where,

(- starts the CLI command
AAA - denotes the CLI function
- - denotes decrement command
- Is optional and denotes number of steps to be decrement (leading zeros are not necessary)
) - ends the CLI command

.

Examples:

Brightness Command	(BRT-10)	Decrement brightness 10 steps
Brightness Command	(BRT-)	Decrement brightness 1 step

Read Commands

Read commands have the following format:

(AAA?) where,

(- starts the CLI command
AAA - denotes the CLI function
? - denotes the read request
) - ends the CLI command

A read command returns the current setting in an ASCII format enclosed in parentheses.

The following Format is defined:

1) Range Format (r-R, V)
2) String Format (S)

Range Format: (r-R, V)

Where

(	open parenthesis marks the start of the CLI response
r	minimum value of the setting's range
R	maximum value of the setting's range
V	the current value of the setting
)	closing parenthesis marks the end of the CLI response

Examples:

(VOL?) Read the current range and value of the projector's volume
Returns: (0-127,64)

(BRT?) Read the current range and value of the projector's brightness
Returns: (0-255,128)

String Format: (S)

Where

(	open parenthesis marks the start of the CLI response
S	character string
)	closing parenthesis marks the end of the CLI response

Examples:

(VER?) Read the current software version
Returns: (v2.0)

Error Handling

When the closing parenthesis is received, the command is validated before it is processed. If the received command is determined to be invalid, a question mark character will be returned as a error response.

Examples:

(123?) "123" is not a valid CLI command prefix. This read request will return '?'

(VOL ?) "VOL" is a valid CLI command prefix, but the spaces between the prefix and the question mark character invalidates the command. This read request will return '?'.

Not all settings are readable. If an attempt is made to read from a write-only setting, the projector will return a question mark.

Example:
(RST?) If the RST CLI command is write only, this read request will return '?'.

A more descriptive error message on the errors can then be queried with the (ERR?) command. The following message are defined:

(No Error Detected)
(Unknown command)
(Unknown parameter)
(Command not supported by this projector)
(Command only available in Power on)
(Projector not ready to be turned on)
(Command only available with valid input source)
(Command only available with external module)
(Command failed)
(Write only Command)
(Command only available in RGB)
(Command only available in VIDEO)
(Command only available in NTSC)

Limitations

The CLI cannot respond to commands coming in at a high rate. Therefore, a delay must occur between commands to ensure that the command is properly executed before the next one is received.

The recommended approach for interfacing to the projector is:

Read:

1. Send the read command
2. Receive read response

Write

1. Send the write command
2. Verify that an error response '?' was not received.

Continually query (for a predefined time) the setting until the value has changed

Some settings don't implement the full range of values in the setting's defined range. If an attempt is made to change the setting to an unsupported value, the CLI will round down to the nearest supported value.

SERIAL COMMUNICATIONS CONFIGURATION

The following table describes the serial communication configuration that should be used when interfacing to the CLI via the serial port. Windows HyperTerminal or ProComm are two tools that can be used to send CLI commands across the serial port.

Setting	Value
Bits per second	19200
Data bits	8
Parity	None
Stop bits	1
Flow Control	None

Table 1 Configuration

TABLE OF END USER COMMANDS

NA = Not Available, Src.dep = Source depended use a read request with ? to get current supported range.

Function	Command	Attribute	Range	Default
Power	PWR	R & W	0 – 1 0 – Off 1 – On	0
Rear	REA	R & W	0 – 1 0 – Off 1 – On	0
Ceiling	CEL	R & W	0 – 1 0 – Off 1 – On	0
Display Message	DMG	R & W	0 – 1 0 – Off 1 – On	1
Power Save	PSV	R & W	0 – 1 0 – Off 1 – On	1
Auto Power Enable	APO	R & W	0 – 1 0 – Off 1 – On	0
Low Power Enable	LPE	R & W	0 – 1 0 – Off 1 – On	0
Screen Saver	SSV	R & W	0 – 1 0 – Off 1 – On	0
Blank Screen	BLK	R & W	0 – 1 0 – Off 1 – On	0
Blank Screen Color	BSC	R & W	0 – 2 0 – black 1 – blue 2 – white	0
Effect Key	EFK	R & W	0 – 10 0 – Blank 1 – Mute 2 – Mask 3 – Aspect Ratio 4 – Source 5 – Auto Image 6 – Freeze 7 – Zoom 8 – About 9 – PiP 10 – Screen Trigger	0
Language	LAN	R & W	0 – 11 0 – English 1 – French 2 – German 3 – Spanish 4 – Chinese Traditional 5 – Japanese 6 – Korean 7 – Portuguese 8 – Russian 9 – Norwegian 10 – Chinese Simplified 11 – Italian	0
Menu Enable	MNU	R&W	0 – 1 0 – disable 1 – enable	0
Menu Navigation	NAV	R&W	0 – 4 0 – up 1 – down 4 – select	NA
Error Message	ERR	R	?	NA

Table 2 System Commands

Function	Command	Attribute	Range	Default
Horizontal Keystone Correction	DKH	R & W	0-100	50
Vertical Keystone Correction	DKV	R & W	0-100	50
Contrast	CON	R & W	0-100	50
Brightness	BRT	R & W	0-100	50
Color	CLR	R & W	0-100	50
Tint	TNT	R & W	0-100	50
Aspect ratio	ARZ	R & W	0–2 0 – native 1 – 16:9 2 – 4:3	0
Presets	PST	R & W	0 – 12 0 – Presentation 1 – Photography 2 – Film 10 – User1 11 – User 2 12 – User 3	1
Freeze Display	FRZ	R&W	0 – 1 0 – Off 1 – On	0

Table 3 Picture

Function	Command	Attribute	Range	Default
Sharpness	SHP	R & W	0–4 0– Softest 1 – Soft 2– Standard 3 – sharp 4 – sharpest	2
Color Temp User Blue	BCG	R & W	0-100	50
Color Temp User Green	GCG	R & W	0-100	50
Color Temp User Red	RCG	R & W	0-100	50
Color Temp	TMP	R & W	0–4 0– Coolest 1 – Cool 2 – Warm 3 – Warmest 4 – User	1
Auto Image	AIM	W	1	1
Phase	MSS	R & W	0-100	NA
Tracking	MTS	R & W	Src.dep	NA
H Position	HPS	R & W	Src.dep	NA
V Position	VPS	R & W	Src.dep	NA
Mask	MSK	R&W	0-1000	0

Table 4 Picture Advance

Function	Command	Attribute	Range	Default
Source 1	SR1	R & W	0 – 5 0 – Computer1 1 – Computer2 2 – Computer3 3 – Video1 4 – Video2 5 – Video3 6 – Video1Rgb	NA
Source 2	SR2	R & W	0 – 5 0 – Computer1 1 – Computer2 2 – Computer3 3 – Video1 4 – Video2 5 – Video3 6 – Video1Rgb	NA
Source 3	SR3	R & W	0 – 5 0 – Computer1 1 – Computer2 2 – Computer3 3 – Video1 4 – Video2 5 – Video3 6 – Video1Rgb	NA
Source 4	SR4	R & W	0 – 5 0 – Computer1 1 – Computer2 2 – Computer3 3 – Video1 4 – Video2 5 – Video3 6 – Video1Rgb	NA
Power Up Source	DSC	R & W	0 – 7 0 – Computer1 1 – Computer2 2 – Computer3 3 – Video1 4 – Video2 5 – Video3 6 – Video1Rgb 7 – Last Used	NA
Auto source	ASC		0 – 1 0 – Off 1 – On	NA
Computer source advance	CAD	W	1 1 – Perform advance	NA
Video source advance	VAD	W	1 1 – Perform advance	NA
Source	SRC	R & W	0 – 5 0 – Computer1 1 – Computer2 2 – Computer3 3 – Video1 4 – Video2 5 – Video3 6 – Video1Rgb	NA
Image Locked and Displayable	ILK	R	0 – 1 0– Not Locked 1 – Locked and displayed	NA
Save User 1 Settings	US1	W	1 1 – Save User 1 Setting	NA
Save User 2 Settings	US2	W	1 1 – Save User 2 Setting	NA
Save User 3 Settings	US3	W	1 1 – Save User 14Setting	NA

Table 5 Sources

Function	Command	Attribute	Range	Default
Factory Reset	RST	W	1 1 – Perform Factory Reset	NA
Perform lamp hours reset	LRT	W	1 1 – Lamp hours Reset	NA
Time lamp 1 lasted (hours)	LB1	R	0-100000	NA
Time lamp 2 lasted (hours)	LB2	R	0-10000	NA
Time lamp 3 lasted (hours)	LB3	R	0-10000	NA
Time lamp 4 lasted (hours)	LB4	R	0-10000	NA
Time lamp 5 lasted (hours)	LB5	R	0-10000	NA
Lamp Lit	LML	R	0-1 0 – Lamp not Lit 1 – Lamp Lit	NA
Lamp Time (hours)	LMP	R	0-10000	NA
Number of lamp resets	LMR	R	0-10000	NA
Lamp total time on for all bulbs (hours)	LMT	R	0-1000000	NA

Table 6 Service

Function	Command	Attribute	Range	Default
Treble	TRB	R&W	0-100	50
Bass	BAS	R&W	0-100	50
Balance	BAL	R&W	0-100	50
Volume	VOL	R&W	0-100	50
Mute	MTE	R&W	0 – 1 0 – Off 1 – On	0
Loudness	LOD	R&W	0 – 1 0 – Off 1 – On	0
Shime	ACE	R&W	0 – 1 0 – Off 1 – On	0
Internal	INT	R&W	0 – 1 0 – Off 1 – On	0

Table 7 Audio

Function	Command	Attribute	Range	Default
Zoom	ZOM	R&W	0 - Input Width in pixels	0
Pan Horizontal	PNH	R&W	0 - Input Width in pixels	NA
Pan Vertical	PNV	R&W	0 - Input Height in pixels	NA
Current Status	CST	R	0 - Standby 1 – Lamp Strike 2 – Lamp on Warming up 3 - Searching 4 – Source detected 5 - Image Locked and Displayable 6 – Lamp off cooling	NA
Status Word	STA	R	? Response is the current Status Word in hex(0000-FFFF) Bit D0: Power Bit D1: Valid Source Bit D2: Signal Source Change Bit D3: Module Change Bit D4: State Change Bit D5-D7: Reserved Bit D8: Fan Stop Bit D9: High Temperature Bit D10: Lamp Time Expired Bit D11-D15 Reserved	NA

Table 8 Projector Management

Function	Command	Attribute	Range	Default
Ip address byte 1	IP1	R&W	0-255	192
Ip address byte 2	IP2	R&W	0-255	168
Ip address byte 3	IP3	R&W	0-255	0
Ip address byte 4	IP4	R&W	0-255	2
Netmask byte 1	NM1	R&W	0-255	255
Netmask byte 2	NM2	R&W	0-255	255
Netmask byte 3	NM3	R&W	0-255	255
Netmask byte 4	NM4	R&W	0-255	0
Gateway byte 1	GT1	R&W	0-255	192
Gateway byte 2	GT2	R&W	0-255	168
Gateway byte 3	GT3	R&W	0-255	0
Gateway byte 4	GT4	R&W	0-255	1
DHCP	DHP	R&W	0 – 1 0 – disable 1 – enable	1
Save & Load[1]	SVN	W	1 1 – Save & Load parameters	NA

Table 9 Network

[1] *Always us the SVN command to save and load the new settings to the network controller*

Function	Command	Attribute	Range	Default
IR	IRE	R&W	0 – 1 0 – disable 1 – enable	1
Keyboard	KBE	R&W	0 – 1 0 – disable 1 – enable	1

Table 10 Misc.

The Misc. commands are not saved in NVRAM and have the following state at Power On:
IRE – Enabled
Keyboard – Enabled