



Communication Protocol
dVision 35 and dVision Scope displays

DIGITAL **PROJECTION**

Setting up LAN communication

The projector is shipped with a set of default settings, these are as follows:

Description	Value
DHCP	On
IP address	0.0.0.0
Subnet mask	0.0.0.0
Default gateway	0.0.0.0
TCP/UDP port	1025

Before you connect the projector to your LAN make sure that the IP settings are set correct according to your LAN configuration.

IP settings can be changed from OSD. It can be set automatically by using DHCP (Dynamic Host Configuration Protocol) or manually by disabling DHCP and set IP address, Subnet mask and Gateway.

When enabling DHCP please allow up to a minute for the projector to receive IP settings from the DHCP server. The IP address will be updated and shown in the OSD.

If there is no DHCP server in the network the projector will be assigned a “zero configuration” address, 169.254.0.0/16.

To renew an IP address, select “renew” in the OSD (setup->network).

Connecting to the projector

You have two options regarding how to make the physical connection to the projector. You can either use a crossover twisted pair (TP) cable directly from the computer to the projector, or two straight-through TP cables with a HUB or a switch between them.

When the projector is set up with proper IP settings, you should be able to control it.

Setting up RS232 communication

Connect to the projector

Connect the projector and host using a standard serial cable with 9-pin female to the host, and 9-pin male to the projector. Pin 2 connects to pin 2, pin 3 connects to pin 3 and pin 5 connects to pin 5.

RS232 Communication parameters

Table 1 shows supported rs232 settings:

Parameter	Data
Baud rate	19200
Parity	N
Databits	8
Stopbits	1
Flowcontrol	None

Table 1: RS232 parameters

Communication Protocol

This section describes how to use the communication protocol to control projectors remotely.

When the projects are connected to either RS232 or LAN you can control the projectors through this ASCII based protocol.

Note: Some commands will generate OSD feedback. This can be turned off from the projector's menu system or by setting "OSDC" to value 0 (OSD off) or value 1 (OSD show only warnings).

Timing

General timing constraints:

- Wait 30 seconds after power on before sending next command.
- Wait for response before sending next command.
- Minimum 2 seconds delay before resending if no response received.
- Minimum 500ms delay between commands.
- Minimum 5 seconds delay after sending 20 commands

Overview

The protocol has the following definition:

HEADER	SEPARATOR	ADDRESS	SEPARATOR	MESSAGE BODY	TERMINATOR
1 byte	1 byte	1 -3 bytes	1 byte	N bytes	1 byte

Field	Description	Comment
Header	ASCII character ':'	Required
Separator	ASCII character 'space'	Optional
Address	1 – 3 bytes address	Optional
Terminator	CR carriage return (0x0D)	Required

Message body

The message body structure is as follows:

MNEMONIC	SEPARATOR]	MODIFIER	SEPARATOR	VALUES
1 byte	1 byte	1 -3 bytes	1 byte	N bytes

Field	Description	Comment
Mnemonic	4 bytes key identifier, not case sensitive	Required
Modifer	Single char symbol	Optional
Values	N bytes value (max 6 bytes)	Optional
Target	N bytes value (max 4 bytes)	Optional
Separator	ASCII character 'space'	Optional

Mnemonic

The Mnemonic is 4 bytes key identifier, know as the ASCII command.

Example: POWR, SABS, IDVI

Modifiers

R	Relative change. Value given will be relative to the existing value. Example: :BRIG R10 will increase brightness with 10 steps
A	Request acknowledges. This modifier is only used to read back the result of the command. Default all commands send acknowledges so this will not be necessary.
	Default all commands send acknowledges so this will not be necessary.
?	Get current value
?M	Get maximum value
?N	Get minimum value
?D	Get default value
?S	Get default step value

Acknowledge/Response

Acknowledge is optional and ON by default. Auto acknowledge can be turned on and off with ECHO command. It can also be activated on a per command basis using modifier A.

ACK	ADDRESS	SEP	COMMAND	SEP	VALUE	TERM
1 byte	3 bytes	1 byte	4 bytes	1 byte	6 bytes	1 byte

Field	Description	Comment
ACK	ASCII character '%'	Always
SEP	ASCII space	Always
VALUE	6 bytes return value	Always
TERM	Termination char 0x0D (CR)	Always

Most commands value returns the actual value of the requested command. If the requested command is not valid the response may include an error message.

Code	Error message	Description
!00001	Access denied	Current access level is too low
!00002	Not available	Command currently not available Example: Contrast is not available when the projector is searching for sources
!00003	Not implemented	Command to implemented
!00004	Value out of range	Value out of range

Some commands could return a value that is more than 6 characters, for instance strings.

Code	Extended info	Description
e00001	Extended info, string	A description string follows

Example:

```
> :seri ?
> %001 SERI e00001 07010001
```

Examples

The protocol accepts one single SPACE between fields, or no SPACE between fields.

'CR' ASCII value carriage return, hex value 0x0D.

SET-commands

SET POWER ON															
:	P	O	W	R	1	'CR'									

:POWR1'CR'

ACKNOWLEDGE POWER ON																
%	0	0	1		P	O	W	R		0	0	0	0	0	1	'CR'

%001 POWR 000001'CR'

SET BRIGHTNESS TO 60															
:	B	R	I	G		6	0	'CR'							

:BRIG 60'CR'

ACKNOWLEDGE BRIGHTNESS																
%	0	0	1		B	R	I	G		0	0	0	0	6	0	'CR'

%001 BRIG 000060'CR'

INCREMENT CONTRAST								
:	C	N	T	R		R	1	'CR'

:CNTR R1'CR'

ACKNOWLEDGE INCREMENT CONTRAST																
%	0	0	1		C	N	T	R		0	0	0	0	6	1	'CR'

%001 CNTR 000061'CR'

DECREMENT CONTRAST with 2 steps									
:	C	N	T	R		R	-	2	'CR'

:CNTR R-2'CR'

ACKNOWLEDGE INCREMENT CONTRAST																
%	0	0	1		C	N	T	R		0	0	0	0	5	9	'CR'

%001 CNTR 000059'CR'

SET-commands with target

SET ASPECT TRIGGER BEHAVIOR 16:10 to off									
:	T	A	T	B		1		3	'CR'

:TATB 1 3'CR'

ACKNOWLEDGE SET ASPECT TRIGGER BEHAVIOR 16:10																
%	0	0	1		T	A	T	B		0	0	0	0	0	1	'CR'

%001 TATB 000001'CR'

GET-commands

GET current value CONTRAST								
:	C	N	T	R		?		'CR'

CNTR?'CR'

ACKNOWLEDGE CONTRAST GET																
%	0	0	1		C	N	T	R		0	0	0	0	5	9	'CR'

%001 CNTR 000059'CR'

GET minimum value BRIGHTNESS								
:	B	R	I	G		?	N	'CR'

:BRIG ?N'CR'

ACKNOWLEDGE BRIGHTNESS GET MIN																
%	0	0	1		B	R	I	G		0	0	0	0	0	0	'CR'

%001 CNTR 000000'CR'

GET-commands with target

GGET ASPECT TRIGGER BEHAVIOR 16:10									
:	T	A	T	B		?		3	'CR'

:TATB ? 3

ACKNOWLEDGE GET ASPECT TRIGGER BEHAVIOR 16:10 off																
%	0	0	1		T	A	T	B		0	0	0	0	0	1	'CR'

%001 TATB 000001 'CR'

ASCII protocol

















Showing all properties for available commands.

Command	Description		Operations supported	Comments
POWR	Power	■	Get, Set	0 - power off, 1 - power on
POST	Power state	■	Get	See value table POST

Soure selection

IABS	Set source abs values	■■■	Get, Set	See value table IABS
IDVI	Select DVI	■■■	Get, Set	1 - DVI 1, 2 - DVI 2
IHDM	Select HDMI	■■■	Get, Set	1 - HDMI 1, 2 - HDMI 2
IVGA	Select VGA	■■■	Get, Set	1 - VGA 1, 2 - VGA 2
IDHD	Select dual head DVI	■■■	Get, Set	
IDHH	Select dual head HDMI	■■■	Get, Set	
IDHX	Select dual head XP2	■■■	Get, Set	
IXP2	Select XP2	■■■	Get, Set	
ISTS	Signal Status	■■■	Get	0 - searching 1 - locked to source

Picture

BRIG	Brightness		Get, Set	
CNTR	Contrast		Get, Set	
CSAT	Saturation	 - Advanced	Get, Set	
PRST	Picture Reset		Get, Set	0 - disable, 1 - enable
PMUT	Picture Mute		Get, Set	See value table SABS
SABS	Set Scaling abs value		Get, Set	
S1T1	Select Scaling 1:1		Get, Set	
S169	Select Scaling 16:9		Get, Set	
SS43	Select Scaling 4:3		Get, Set	
SFLA	Select Scaling FillAll		Get, Set	
SFAR	Select Scaling FillAspectRatio		Get, Set	
S235	Select Scaling Fill 2.35:1		Get, Set	
SANL	Select Scaling Anamorphic Lens		Get, Set	1 - Film 1, 2 - Film 2
GAVI	Select Gamma Video		Get, Set	1 - Video 1, 2 - Video2
GACO	Select Gamma Computer		Get, Set	1 - Computer 1, 2 - Computer 2
GABS	Set Gamma abs value		Get, Set	See value table GABS

Picture->

BCCR	BrilliantColor Control		Get, Set	See value table BCCR
CMOD	Color Management Enable		Get, Set	0 - disable, 1- enable
CMWH	Color Managmenet White		Get, Set	
CMXV	Color Management X-Coordinate		Get, Set	
CMYV	Color Management Y-Coordinate		Get, Set	3200 - 9300
CMTV	Color Management Temperature		Get, Set	
RD65	Reset to D65		Set	See value table DSCR
DSCR	Desired Coords Mode	splh	Get, Set	
DSRX	Desired Red X		Get, Set	
DSRY	Desired Red Y		Get, Set	
DSRG	Desired Red Gain		Get, Set	
DSGX	Desired Green X		Get, Set	

Command	Description		Operations supported	Comments
DSGY	Desired Green Y		Get, Set	
DSGG	Desired Green Gain		Get, Set	
DSBX	Desired Blue X		Get, Set	
DSBY	Desired Blue Y		Get, Set	
DSBG	Desired Blue Gain		Get, Set	
DSCX	Desired Cyan X		Get, Set	
DSCY	Desired Cyan Y		Get, Set	
DSCG	Desired Cyan Gain		Get, Set	
DSMX	Desired Magenta X		Get, Set	
DSMY	Desired Magenta Y		Get, Set	
DSMG	Desired Magenta Gain		Get, Set	
DSYX	Desired Yellow X		Get, Set	
DSYY	Desired Yellow Y		Get, Set	
DSYG	Desired Yellow Gain		Get, Set	
DSWG	Desired White Gain		Get, Set	
MSRX	Measured Red X		Get, Set	
MSRY	Measured Red Y		Get, Set	
MSRL	Measured Red Luminance		Get, Set	
MSGX	Measured Green X		Get, Set	
MSGY	Measured Green Y		Get, Set	
MSGL	Measured Green Luminance		Get, Set	
MSBX	Measured Blue X		Get, Set	
MSBY	Measured Blue Y		Get, Set	
MSBL	Measured Blue Luminance		Get, Set	
MSWX	Measured White X		Get, Set	
MSWY	Measured White Y		Get, Set	
MSWL	Measured White Luminance		Get, Set	
MSDX	Measured BC1 X		Get, Set	
MSDY	Measured BC1 Y		Get, Set	
MSDL	Measured BC1 Luminance		Get, Set	
MSEX	Measured BC2 X		Get, Set	
MSEY	Measured BC2 Y		Get, Set	
MSEL	Measured BC2 Luminance		Get, Set	
MFEL	Factory Measured BC2 Luminance		Get, Set	
CMTTP	Color Management Test Patterns		Get, Set	
RCMN	Color management Reset to Native		Set	
RWHN	Color Management reset white to native		Set	

Picture->Advanced				
HPOS	Horizontal position	- Advanced	Get, Set	Only for analog sources
VPOS	Vertical position	- Advanced	Get, Set	Only for analog sources
FREQ	Frequency	- Advanced	Get, Set	Only for analog sources
PHSE	Phase	- Advanced	Get, Set	Only for analog sources
DCSP	Color Space		Get, Set	0 - auto, 1 - RGB, 2 - REC 709, 3 - REC 601
DVST	Input Level		Get, Set	0 - auto, 1 - computer, 2 - video

Command	Description		Operations supported	Comments
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Picture->Advanced->InputCropping

CTYP	Input Cropping Mode		Get, Set	0 - Disabled, 1 - Auto, 2 - 2.35:1, 3 - Manual
COFF	Select Input Cropping Mode Disabled		Get, Set	
CAUT	Select Input Cropping Mode Auto		Get, Set	
C235	Select Input Cropping Mode 2.35:1		Get, Set	
CMAN	Select Input Cropping Mode Manual		Get, Set	
CTOP	Input Cropping Top		Get, Set	35 - input image height
CBTM	Input Cropping Bottom		Get, Set	35 - input image height

Installation

DESK	Select Orientation Desktop Front		Get, Set	
CEIL	Select Orientation Ceiling Front		Get, Set	
RDES	Select Orientation Desktop Rear		Get, Set	
RCEI	Select Orientation Ceiling Rear		Get, Set	
ORIE	Select Orientation abs value		Get, Set	See value table ORIE
SCAN	Source Scan		Get, Set	0 - disable, 1 - enable
IR01	IR Enable 1		Get, Set	0 - disable, 1 - enable
IR02	IR Enable 2		Get, Set	0 - disable, 1 - enable
IR03	IR Enable 3		Get, Set	0 - disable, 1 - enable
OSDC	OSD Enable		Get, Set	See value table OSDC
TEST	Test Image		Get, Set	0 - 7 different test patterns
DHED	Dual Head Setup Mode		Get, Set	0 - off, 1 - side by side
SVGA	Sync termination VGA	- Advanced		0 - 2.2kOhm, 1 - 75Ohm
SNCL	Sync level VGA	- Advanced		0-255
SNCS	Sync Level SOG	- Advanced		0-31
OPFI	Infitec filter			0 - disable, 1 - enable
CSCC	Infitec CSC			0 - disable, 1 - enable
EDIR	Edid resolution			See value table EDIR
EDIT	Edid type			See value table EDIT

Installation->lamp

ECOM	Eco Mode		Get, Set	0 - disable, 1 - enable
LPW1	Lamp1 Power		Get, Set	
LPW2	Lamp2 Power		Get, Set	
LMOD	Lamp Mode		Get, Set	See value table LMOD
LDLY	Lamp Auto Switch Delay		Get, Set	

Installation->lamp

LPW1	LED Power		Get, Set	
LDMM	LED Dim Mode	LED	Get, Set	0 - disable, 1 - enable
LDCR	LED Dim Custom Red	LED	Get, Set	
LDCG	LED Dim Custom Green	LED	Get, Set	
LDCB	LED Dim Custom Blue	LED	Get, Set	

Command	Description		Operations supported	Comments
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Installation->trigger

TRG1	Trigger 1 Mode		Get, Set	See value table TRGx
TRG2	Trigger 2 Mode		Get, Set	See value table TRGx
TATB	Aspect Trigger Behavior		Get, Set	See value table TATB

Installation->frame lock setup

FLSO	FrameLock Source		Get, Set	0 - Internal, 1 - External
FLIT	FrameLock Input Termination		Get, Set	0 - TTL, 1 - 75Ohm
FLOS	FrameLock Output Signal		Get, Set	0 - Throughput, 1 - Regenerated
FLOT	FrameLock Output Termination		Get, Set	0 - Auto, 1 - TTL, 2 - 75Ohm
FLST	FrameLock Status		Get	

Settings

FCRE	Factory Reset		Set	
FCRL	Factory reset level		Get, Set	0 - limited, 1 - full
PINC	PIN Code		Set	
CODE	Service Code		Set	
RCID	RCID Internal		Get, Set	
DPMS	DPMS		Get, Set	0 - disable, 1 - enable
DPMT	DPMS Timeout		Get, Set	
KEYB	Backlight Timeout		Get, Set	
MNUT	Menu Timeout		Get, Set	
BACK	Background color		Get, Set	
SPLH	Splash		Get, Set	
LMUT	LED indicators mute		Get, Set	0 - off, 1 - on
BAUD	Baudrate		Get, Set	See value table BAUD

Settings->Set date and time

RTCH	Real Time Clock Hour		Get, Set	
RTCM	Real Time Clock Minute		Get, Set	
RTCS	Real Time Clock Second		Get, Set	
RTCD	Real Time Clock Day		Get, Set	
RTCN	Real Time Clock Month		Get, Set	
RTCY	Real Time Clock Year		Get, Set	
RTCW	Real Time Clock Day of Week		Get	

Stereo (120Hz only)

TDSM	Stereo Mode		Get, Set	0 - off, 1 - on
TDGT	Glass type		Get, Set	0 - DLP Link™, 1 - IR, 2 - IR high brightness
TDGD	Genlock phase delay		Get, Set	
TDSE	Swap eyes		Get, Set	0 - off, 1 - on

Command	Description		Operations supported	Comments
Lens control				
FOIN	Focus In	■	Set	1 - Slow, 2 - Medium, 3 - Fast
FOUT	Focus Out	■	Set	1 - Slow, 2 - Medium, 3 - Fast
ZOIN	Zoom In	■	Set	1 - Slow, 2 - Medium, 3 - Fast
ZOUT	Zoom Out	■	Set	1 - Slow, 2 - Medium, 3 - Fast
IROP	Iris Open	■	Set	1 - Slow, 2 - Medium, 3 - Fast
IRCL	Iris Close	■	Set	1 - Slow, 2 - Medium, 3 - Fast
LSDW	Lens Shift Down	■	Set	1 - Slow, 2 - Medium, 3 - Fast
LSUP	Lens Shift Up	■	Set	1 - Slow, 2 - Medium, 3 - Fast
LSLF	Lens Shift Left	■	Set	1 - Slow, 2 - Medium, 3 - Fast
LSRH	Lens Shift Right	■	Set	1 - Slow, 2 - Medium, 3 - Fast
SHUT	Shutter	■	Set	0 - disable, 1 - enable
LENS	Lens ID	■	Get	
LMON	Lens Monitoring	■	Get, Set	0 - disable, 1 - enable

Lamp status				
LRM1	Lamp1 Estimated Remaining Lamp Time	■	Get	
LTR1	Lamp1 Runtime	■	Get	
LHO1	Lamp Channel 1 Total Time	■	Get	
LST1	Lamp1 Status	■	Get	See value table LST1 and LST2
LRM2	Lamp2 Estimated Remaining Lamp Time	■	Get	
LTR2	Lamp2 Runtime	■	Get	
LHO2	Lamp Channel 2 Total Time	■	Get	
LST2	Lamp2 Status	■	Get	See value table LST1 and LST2
UTOT	Unit Time Total	■	Get	

Menu navigate				
MENU	Menu Navigate Toggle OSD Menu	■	Set	
NVUP	Menu Navigate Up	■	Set	
NVDW	Menu Navigate Down	■	Set	
NVLF	Menu Navigate Left	■	Set	
NVRH	Menu Navigate Right	■	Set	
NVOK	Menu Navigate Ok	■	Set	

Miscellaneous				
ECHO	Communication Response (on/off)	■	Set	
LANG	Language	■	Get, Set	
SINF	Show OSD Info	■	Set	

Thermal				
THRM	Thermal Status	■	Get	
FAN1	Fan Speed 1	■	Get	
FAN2	Fan Speed 2	■	Get	
FAN3	Fan Speed 3	■	Get	
FAN4	Fan Speed 4	■	Get	
FAN5	Fan Speed 5	■	Get	
FAN6	Fan Speed 6	■	Get	
FAN7	Fan Speed 7	■	Get	
FAN8	Fan Speed 8	■	Get	

Command	Description		Operations supported	Comments
SNS1	Sensor Value 1	■	Get	
SNS2	Sensor Value 2	■	Get	
SNS3	Sensor Value 3	■	Get	
SNS4	Sensor Value 4	■	Get	
SNS5	Sensor Value 5	■	Get	
SNS6	Sensor Value 6	■	Get	
SNS7	Sensor Value 7	■	Get	
SNS8	Sensor Value 8	■	Get	

Status				
PLAT	Platform Name String	■	Get	
SERI	Serial Number String	■	Get	
MODL	Model Name String	■	Get	
PART	Part Number String	■	Get	
SVER	Software Version	■	Get	
ACSS	Current Access Level	■	Get	
MACA	MAC address	■	Get	
IPAD	IP address	■	Get	
LEST	Indicator LED state	■	Get	See value table LEST
SWSN	SVN SW Revision	■	Get	

Value tables

IABS Set source abs values	
Value	Description
0	VGA 1
1	VGA 2
2	DVI 1
7	Component
8	HDMI 1
10	DVI 2
11	HDMI 2
12	Dual Head DVI
13	Dual Head HDMI
14	Dual Head XP2
15	XP2 A
16	XP2 B

SABS Set scaling abs values	
Value	Description
0	1:1
1	Fill All
2	Fill Aspect Ratio
3	Fill 16:9
4	Fill 4:3
5	Fill 2.35:1
11	Anamorphic Lens

LST1 and LST2 Lamp status	
Value	Description
0	Defect
1	Warming up
2	Lamp is on
3	Lamp is off
4	Lamp is cooling down
5	Lamp is not present

GABS Set Gamma abs value	
Value	Description
0	Film 2.2
1	Film 2.8
2	Video 1
3	Video 2
7	Computer 1
8	Computer 2

DSCR Desired Coords Mode	
Value	Description
0	Off
1	RGB
2	RGBCMY

ORIE Select Orientation abs value	
Value	Description
0	Desktop front
1	Ceiling rear
2	Desktop rear
3	Ceiling front

OSDC OSD Enable	
Value	Description
0	OSD off
1	OSD show only warnings
2	OSD on

LMOD Lamp Mode	
Value	Description
0	Single lamp 1
1	Single lamp 2
2	Dual lamps
3	Auto lamp switch

BCCR BrilliantColor Control	
Value	Description
0	Off
1	Computer balanced
2	Video balanced
3	Computer native
4	Video native

POST Power state	
Value	Description
0	Deep sleep
1	Off
2	Powering up
3	On
4	Powering down
5	Critical powering down
6	Critical off

LEST Status LED state	
Value	Description
0	Green/Blue On
1	Green/Blue Flash
2	Yellow On
3	Yellow Flash
4	Red On
5	Red Flash

DCSP Digital colorspace	
Value	Description
0	RGB
1	YPbPr 709
2	YpbPr 601

TRGx Trigger mode	
Value	Description
1	On
2	Off
3	Screen
4	Aspect

TATB Aspect trigger behavior		
Target	Value	Description
0 - 4:3		
1 - 5:4	0	on
2 - 16:9	1	off
3 - 16:10	2	no change
4 - no source		
5 - standby		

EDIR Edid resolution		
Target	Value	Description
0 - VGA1	0	Auto
1 - VGA2	1	Custom (not implemented)
2 - DVI1	2	VGA
3 - HDMI1	3	SVGA
12 - DVI2	4	XGA
14 - HDMI2	5	720 50Hz
	6	720 60Hz
	7	WXGA 1366
	8	SXGA
	9	SX+
	10	1080 deep color
	11	1080 standard
	12	WUXGA
	13	WQXGA (DVI1/2 only)

EDIT Edit type		
Target	Value	Description
3 - HDMI1	1	DVI
14 - HDMI2	2	HDMI

BAUD Trigger mode	
Value	Description
4800	4800
9600	9600
19200	19200
38400	38400
57600	57600
115200	115200