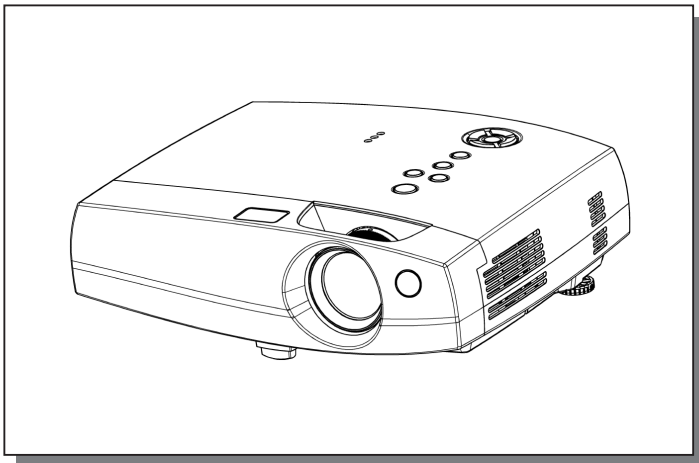


3M

S40/X40 Multimedia Projector

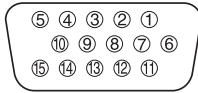
Operator's Guide **TECHNICAL**



TECHNICAL

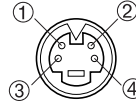
SIGNAL CONNECTOR PIN ASSIGNMENT

rgb



D-sub 15-pin Shrink

s-video



Mini Din 4-pin

Pin No	Signal	Pin No	Signal
1	Video input Red	9	-
2	Video input Green	10	Ground
3	Video input Blue	11	-
4	-	12	SDA (DDC)
5	Ground	13	H. sync./ Composite sync.
6	Ground Red	14	Vertical sync
7	Ground Green	15	SCL (DDC)
8	Ground Blue		

Mini Din 4-pin	
Pin No	Signal
1	Color: 0.286Vp-p (NTSC, burst signal), 75Ω terminator 0.3Vp-p (PAL/SECAM, burst signal), 75Ω terminator
2	Brightness: 1.0Vp-p, 75Ω terminator
3	Ground
4	Ground

signal	Terminal	Specification	
RGB signal input	rgb	Video: Analog 0.7Vp-p, 75Ω terminator (positive) H/V. sync.: TTL level (positive/negative) Composite sync.: TTL level D-sub 15-pin shrink jack	
AUDIO input (from the computer)	audio	200mVrms, 50 kΩ (max. 3.0Vp-p) Stereo mini jack	
Video signal input	video	1.0Vp-p, 75Ω terminator, RCA jack	
	component video	Y	1.0 Vp-p, 75 Ω Terminator (Positive)
		C _B /P _B	0.7 Vp-p, 75 Ω Terminator (Positive)
		C _R /P _R	0.7 Vp-p, 75 Ω Terminator (Positive)
Audio input (from video equipment)	audio (R, L)	200mVrms, 50 kΩ (max. 3.0Vp-p) RCA jack	

EXAMPLE OF COMPUTER SIGNAL

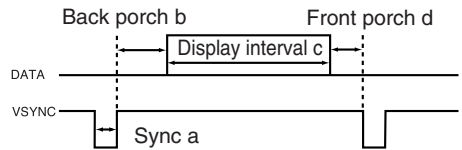
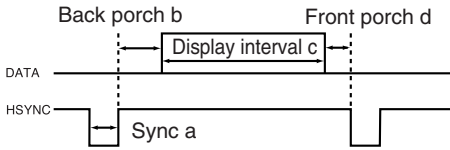
Resolution H × V	fH (kHz)	fV (Hz)	Rating	Signal mode	Display mode	
					S40	X40
720 × 400	37.9	85.0	VESA	TEXT	Zoom in	Zoom in
640 × 480	31.5	59.9	VESA	VGA (60Hz)	Zoom in	Zoom in
640 × 480	35.0	66.7		Mac13"mode	Zoom in	Zoom in
640 × 480	37.9	72.8	VESA	VGA (72Hz)	Zoom in	Zoom in
640 × 480	37.5	75.0	VESA	VGA (75Hz)	Zoom in	Zoom in
640 × 480	43.3	85.0	VESA	VGA (85Hz)	Zoom in	Zoom in
800 × 600	35.2	56.3	VESA	SVGA (56Hz)		Zoom in
800 × 600	37.9	60.3	VESA	SVGA (60Hz)		Zoom in
800 × 600	48.1	72.2	VESA	SVGA (72Hz)		Zoom in
800 × 600	46.9	75.0	VESA	SVGA (75Hz)		Zoom in
800 × 600	53.7	85.1	VESA	SVGA (85Hz)		Zoom in
832 × 624	49.7	74.5		Mac16"mode	Zoom out	Zoom in
1024 × 768	48.4	60.0	VESA	XGA (60Hz)	Zoom out	
1024 × 768	56.5	70.1	VESA	XGA (70Hz)	Zoom out	
1024 × 768	60.0	75.0	VESA	XGA (75Hz)	Zoom out	
1024 × 768	68.7	85.0	VESA	XGA (85Hz)	Zoom out	
1152 × 864	67.5	75.0	VESA	SXGA (75Hz)	Zoom out	Zoom out
1280 × 960	60.0	60.0	VESA	SXGA (60Hz)	Zoom out	Zoom out
1280 × 1024	64.0	60.0	VESA	SXGA (60Hz)	Zoom out	Zoom out
1280 × 1024	80.0	75.0	VESA	SXGA (75Hz)	Zoom out	Zoom out
1280 × 1024	91.2	85.0	VESA	SXGA (85Hz)	Zoom out	Zoom out
1600 × 1200	75.0	60.0	VESA	UXGA (60Hz)	Zoom out	Zoom out

- NOTE** • Some computers may have multiple display screen modes. Use of some of these modes will not be possible with this projector.
- Be sure to check jack type, signal level, timing and resolution before connecting this projector to a computer.
 - Depending on the input signal, full-size display may not be possible in some cases. Refer to the number of display pixels above.
 - This projector will display up to UXGA (1600X1200) resolution signals but the image will be rescaled to the native resolution of the projector. Best display performance is achieved when the signal input resolution is the same as the native resolution of the projector.
 - The image may not be displayed correctly when the input sync. signal is "Composite Sync." or "Sync. on G".

INITIAL SET SIGNALS

The following signals are used for the initial settings.

The signal timing of some computer models may be different. In such case, refer to adjusted the V.POSIT and H.POSIT of the menu.

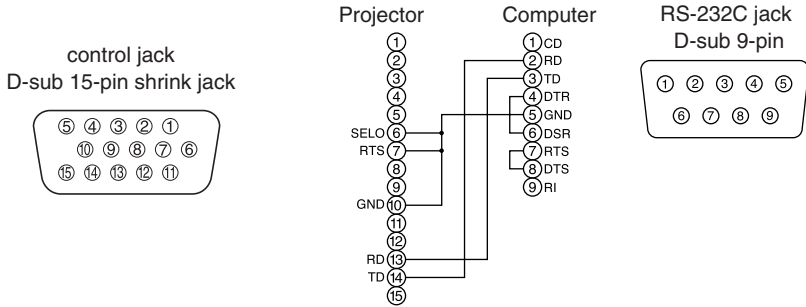


Computer / Signal	Horizontal signal timing (μs)			
	a	b	c	d
TEXT	2.0	3.0	20.3	1.0
VGA (60Hz)	3.8	1.9	25.4	0.6
Mac 13"mode	2.1	3.2	21.2	2.1
VGA (72Hz)	1.3	3.8	20.3	1.0
VGA (75Hz)	2.0	3.8	20.3	0.5
VGA (85Hz)	1.6	2.2	17.8	1.6
SVGA (56Hz)	2.0	3.6	22.2	0.7
SVGA (60Hz)	3.2	2.2	20.0	1.0
SVGA (72Hz)	2.4	1.3	16.0	1.1
SVGA (75Hz)	1.6	3.2	16.2	0.3
SVGA (85Hz)	1.1	2.7	14.2	0.6
Mac 16"mode	1.1	3.9	14.5	0.6
XGA (60Hz)	2.1	2.5	15.8	0.4
XGA (70Hz)	1.8	1.9	13.7	0.3
XGA (75Hz)	1.2	2.2	13.0	0.2
XGA (85Hz)	1.0	2.2	10.8	0.5
1152×864 (75Hz)	1.2	2.4	10.7	0.6
1280×960 (60Hz)	1.0	2.9	11.9	0.9
1280×1024 (60Hz)	1.0	2.3	11.9	0.4
1280×1024 (75Hz)	1.1	1.8	9.5	0.2
1280×1024 (85Hz)	1.0	1.4	8.1	0.4
1600×1200 (60Hz)	1.2	1.9	9.9	0.4

Computer / Signal	Vertical signal timing (lines)			
	a	b	c	d
TEXT	3	42	400	1
VGA (60Hz)	2	33	480	10
Mac 13"mode	3	39	480	3
VGA (72Hz)	3	28	480	9
VGA (75Hz)	3	16	480	1
VGA (85Hz)	3	25	480	1
SVGA (56Hz)	2	22	600	1
SVGA (60Hz)	4	23	600	1
SVGA (72Hz)	6	23	600	37
SVGA (75Hz)	3	21	600	1
SVGA (85Hz)	3	27	600	1
Mac 16"mode	3	39	624	1
XGA (60Hz)	6	29	768	3
XGA (70Hz)	6	29	768	3
XGA (75Hz)	3	28	768	1
XGA (85Hz)	3	36	768	1
1152×864 (75Hz)	3	32	864	1
1280×960 (60Hz)	3	36	960	1
1280×1024 (60Hz)	3	38	1024	1
1280×1024 (75Hz)	3	37	1024	2
1280×1024 (85Hz)	3	44	1024	1
1600×1200 (60Hz)	3	46	1200	1

RS-232C COMMUNICATION

- (1) Turn off the projector and computer power supplies and connect with the RS-232C cable.
- (2) Turn on the computer power supply and after the computer has started up, turn on the projector power supply.



Communications setting

19200bps, 8N1

1 Protocol

Consist of header (7 bytes) + command data (6 bytes).

2 Header

BE + EF + 03 + 06 + 00 + CRC_low + CRC_high

CRC_low : Lower byte of CRC flag for command data.

CRC_high : Upper byte of CRC flag for command data.

3 Command data

Command data chart

byte_0	byte_1	byte_2	byte_3	byte_4	byte_5
Action		Type		Setting code	
low	high	low	high	low	high

Action (byte_0 - 1)

Action	Classification	Content
1	SET	Change setting to desired value.
2	GET	Read projector internal setup value.
4	INCREMENT	Increment setup value by 1.
5	DECREMENT	Decrement setup value by 1.
6	EXECUTE	Run a command.

Requesting projector status (Get command)

- (1) Send the request code Header + Command data ('02H'+ '00H'+ type (2 bytes) + '00H'+ '00H') from the computer to the projector.
- (2) The projector returns the response code '1DH'+ data (2 bytes) to the computer.

Changing the projector settings (Set command)

- (1) Send the setting code Header + Command data ('01H'+ '00H'+ type (2 bytes) + setting code (2 bytes)) from the computer to the projector.
- (2) The projector changes the setting based on the above setting code.
- (3) The projector returns the response code '06H' to the computer.

Using the projector default settings (Reset Command)

- (1) The computer sends the default setting code Header + Command data ('06H'+ '00H'+ type (2 bytes) + '00H'+ '00H') to the projector.
- (2) The projector changes the specified setting to the default value.
- (3) The projector returns the response code '06H' to the computer.

Increasing the projector setting value (Increment command)

- (1) The computer sends the increment code Header + Command data ('04H'+ '00H'+ type (2 bytes) + '00H'+ '00H') to the projector.
- (2) The projector increases the setting value on the above setting code.
- (3) The projector returns the response code '06H' to the computer.

Decreasing the projector setting value (Decrement command)

- (1) The computer sends the decrement code Header + Command data ('05H'+ '00H'+ type (2 bytes) + '00H'+ '00H') to the projector.
- (2) The projector decreases the setting value on the above setting code.
- (3) The projector returns the response code '06H' to the computer.

When the projector cannot understand the received command

When the projector cannot understand the received command, the error code '15H' is sent back to the computer.

Sometimes the projector cannot properly receive the command. In such a case, the command is not executed and the error code '15H' is sent back to the computer. If this error code is returned, send the same command again.

When the projector cannot execute the received command.

When the projector cannot execute the received command, the error code '1cH' + 'xxxxH' is sent back to the computer. When the data length is greater than indicated by the data length code, the projector ignore the excess data code.

Conversely when the data length is shorter than indicated by the data length code, an error code will be returned to the computer.

- NOTE**
- Operation cannot be guaranteed when the projector receives an undefined command or data.
 - Provide an interval of at least 40ms between the response code and any other code.
 - The projector outputs test data when the power supply is switched ON, and when the lamp is lit. Ignore this data.
 - Commands are not accepted during warm-up.

RS-232C COMMUNICATION (continued)

Command data chart

Names	Operation type		Header				Command data								
						CRC	Action	Type	Setting code						
Blank Color	Set	Blue	BE	EF	03	06	00	CB	D3	01	00	00	30	03	00
		White	BE	EF	03	06	00	6B	D0	01	00	00	30	05	00
		Black	BE	EF	03	06	00	9B	D0	01	00	00	30	06	00
	Get	BE	EF	03	06	00	08	D3	02	00	00	30	00	00	00
Mirror	Set	Normal	BE	EF	03	06	00	C7	D2	01	00	01	30	00	00
		H Inverse	BE	EF	03	06	00	57	D3	01	00	01	30	01	00
		V Inverse	BE	EF	03	06	00	A7	D3	01	00	01	30	02	00
		H&V Inverse	BE	EF	03	06	00	37	D2	01	00	01	30	03	00
	Get	BE	EF	03	06	00	F4	D2	02	00	01	30	00	00	00
Freeze	Set	Normal	BE	EF	03	06	00	83	D2	01	00	02	30	00	00
		Freeze	BE	EF	03	06	00	13	D3	01	00	02	30	01	00
	Get	BE	EF	03	06	00	B0	D2	02	00	02	30	00	00	00
Startup	Set	TURN ON	BE	EF	03	06	00	0B	D2	01	00	04	30	00	00
		TURN OFF	BE	EF	03	06	00	9B	D3	01	00	04	30	01	00
	Get	BE	EF	03	06	00	38	D2	02	00	04	30	00	00	00
Language	Set	English	BE	EF	03	06	00	F7	D3	01	00	05	30	00	00
		Français	BE	EF	03	06	00	67	D2	01	00	05	30	01	00
		Deutsch	BE	EF	03	06	00	97	D2	01	00	05	30	02	00
		Español	BE	EF	03	06	00	07	D3	01	00	05	30	03	00
		Italiano	BE	EF	03	06	00	37	D1	01	00	05	30	04	00
		Norsk	BE	EF	03	06	00	A7	D0	01	00	05	30	05	00
		Nederlands	BE	EF	03	06	00	57	D0	01	00	05	30	06	00
		Português	BE	EF	03	06	00	C7	D1	01	00	05	30	07	00
		日本語	BE	EF	03	06	00	37	D4	01	00	05	30	08	00
	中文	BE	EF	03	06	00	A7	D5	01	00	05	30	09	00	
한글	BE	EF	03	06	00	57	D5	01	00	05	30	0A	00		
Get	BE	EF	03	06	00	C4	D3	02	00	05	30	00	00	00	
Magnify	Get	BE	EF	03	06	00	7C	D2	02	00	07	30	00	00	00
	Increment	BE	EF	03	06	00	1A	D2	04	00	07	30	00	00	00
	Decrement	BE	EF	03	06	00	CB	D3	05	00	07	30	00	00	00
Auto off	Get	BE	EF	03	06	00	08	86	02	00	10	31	00	00	00
	Increment	BE	EF	03	06	00	6E	86	04	00	10	31	00	00	00
	Decrement	BE	EF	03	06	00	BF	87	05	00	10	31	00	00	00
Brightness Reset	Execute	BE	EF	03	06	00	58	D3	06	00	00	70	00	00	00
Contrast Reset	Execute	BE	EF	03	06	00	A4	D2	06	00	01	70	00	00	00
V.Position Reset	Execute	BE	EF	03	06	00	E0	D2	06	00	02	70	00	00	00

Names	Operation type		Header			Command data			
						CRC	Action	Type	Setting code
H.Position Reset	Execute		BE EF	03 06 00	IC D3	06 00	03 70	00 00	
H.Size Reset	Execute		BE EF	03 06 00	68 D2	06 00	04 70	00 00	
Color Balance R Reset	Execute		BE EF	03 06 00	94 D3	06 00	05 70	00 00	
Color Balance B Reset	Execute		BE EF	03 06 00	D0 D3	06 00	06 70	00 00	
Sharpness Reset	Execute		BE EF	03 06 00	C4 D0	06 00	09 70	00 00	
Color Reset	Execute		BE EF	03 06 00	80 D0	06 00	0A 70	00 00	
Tint Reset	Execute		BE EF	03 06 00	7C D1	06 00	0B 70	00 00	
Keystone_V Reset	Execute		BE EF	03 06 00	08 D0	06 00	0C 70	00 00	
Auto Adjust	Execute		BE EF	03 06 00	91 D0	06 00	0A 20	00 00	
Lamp Time Reset	Execute		BE EF	03 06 00	58 DC	06 00	30 70	00 00	
Filter Time Reset	Execute		BE EF	03 06 00	98 C6	06 00	40 70	00 00	
Blank on/off	Set	off	BE EF	03 06 00	FB D8	01 00	20 30	00 00	
		on	BE EF	03 06 00	6B D9	01 00	20 30	01 00	
	Get		BE EF	03 06 00	C8 D8	02 00	20 30	00 00	
Error Status	Get		BE EF	03 06 00	D9 D8	02 00	20 60	00 00	
			(Example of Return) 00 00 01 00 02 00 03 00 (Normal) (Cover-error) (Fan-error) (Lamp-error) 04 00 05 00 06 00 07 00 08 00 (Temp-error) (Air flow-error) (Lamp-Time-over) (Cool-error) (Filter-Error)						
Power	Set	OFF	BE EF	03 06 00	2A D3	01 00	00 60	00 00	
		ON	BE EF	03 06 00	BA D2	01 00	00 60	01 00	
	Get		BE EF	03 06 00	19 D3	02 00	00 60	00 00	
Input Source	Set	RGB	BE EF	03 06 00	FE D2	01 00	00 20	00 00	
		Video	BE EF	03 06 00	6E D3	01 00	00 20	01 00	
		SVideo	BE EF	03 06 00	9E D3	01 00	00 20	02 00	
		Component	BE EF	03 06 00	AE D1	01 00	00 20	05 00	
	Get		BE EF	03 06 00	CD D2	02 00	00 20	00 00	
Volume	Get		BE EF	03 06 00	31 D3	02 00	01 20	00 00	
	Increment		BE EF	03 06 00	57 D3	04 00	01 20	00 00	
	Decrement		BE EF	03 06 00	86 D2	05 00	01 20	00 00	
Mute	Set	Normal	BE EF	03 06 00	46 D3	01 00	02 20	00 00	
		Mute	BE EF	03 06 00	D6 D2	01 00	02 20	01 00	
	Get		BE EF	03 06 00	75 D3	02 00	02 20	00 00	
Brightness	Get		BE EF	03 06 00	89 D2	02 00	03 20	00 00	
	Increment		BE EF	03 06 00	EF D2	04 00	03 20	00 00	
	Decrement		BE EF	03 06 00	3E D3	05 00	03 20	00 00	

Command data chart (continued)

Names	Operation type	Header			Command data				
					CRC	Action	Type	Setting code	
Contrast	Get	BE	EF	03 06 00	FD D3	02 00	04 20	00 00	
	Increment	BE	EF	03 06 00	9B D3	04 00	04 20	00 00	
	Decrement	BE	EF	03 06 00	4A D2	05 00	04 20	00 00	
Color Balance R	Get	BE	EF	03 06 00	01 D2	02 00	05 20	00 00	
	Increment	BE	EF	03 06 00	67 D2	04 00	05 20	00 00	
	Decrement	BE	EF	03 06 00	B6 D3	05 00	05 20	00 00	
Color Balance B	Get	BE	EF	03 06 00	45 D2	02 00	06 20	00 00	
	Increment	BE	EF	03 06 00	23 D2	04 00	06 20	00 00	
	Decrement	BE	EF	03 06 00	F2 D3	05 00	06 20	00 00	
Keystone_V	Get	BE	EF	03 06 00	B9 D3	02 00	07 20	00 00	
	Increment	BE	EF	03 06 00	DF D3	04 00	07 20	00 00	
	Decrement	BE	EF	03 06 00	0E D2	05 00	07 20	00 00	
Aspect	Set	4:3	BE	EF	03 06 00	9E D0	01 00	08 20	00 00
		16:9	BE	EF	03 06 00	0E D1	01 00	08 20	01 00
		Small	BE	EF	03 06 00	FE D1	01 00	08 20	02 00
	Get	BE	EF	03 06 00	AD D0	02 00	08 20	00 00	
Picture Position at 16 : 9 or Small	Set	Default	BE	EF	03 06 00	62 D1	01 00	09 20	00 00
		Bottom	BE	EF	03 06 00	F2 D0	01 00	09 20	01 00
		Top	BE	EF	03 06 00	02 D0	01 00	09 20	02 00
	Get	BE	EF	03 06 00	51 D1	02 00	09 20	00 00	
V.Position	Get	BE	EF	03 06 00	0D 83	02 00	00 21	00 00	
	Increment	BE	EF	03 06 00	6B 83	04 00	00 21	00 00	
	Decrement	BE	EF	03 06 00	BA 82	05 00	00 21	00 00	
H.Position	Get	BE	EF	03 06 00	F1 82	02 00	01 21	00 00	
	Increment	BE	EF	03 06 00	97 82	04 00	01 21	00 00	
	Decrement	BE	EF	03 06 00	46 83	05 00	01 21	00 00	
H.Size	Get	BE	EF	03 06 00	B5 82	02 00	02 21	00 00	
	Increment	BE	EF	03 06 00	D3 82	04 00	02 21	00 00	
	Decrement	BE	EF	03 06 00	02 83	05 00	02 21	00 00	
H.Phase	Get	BE	EF	03 06 00	49 83	02 00	03 21	00 00	
	Increment	BE	EF	03 06 00	2F 83	04 00	03 21	00 00	
	Decrement	BE	EF	03 06 00	FE 82	05 00	03 21	00 00	
Sharpness	Get	BE	EF	03 06 00	F1 72	02 00	01 22	00 00	
	Increment	BE	EF	03 06 00	97 72	04 00	01 22	00 00	
	Decrement	BE	EF	03 06 00	46 73	05 00	01 22	00 00	
Color	Get	BE	EF	03 06 00	B5 72	02 00	02 22	00 00	
	Increment	BE	EF	03 06 00	D3 72	04 00	02 22	00 00	
	Decrement	BE	EF	03 06 00	02 73	05 00	02 22	00 00	

Names	Operation type		Header			Command data			
						CRC	Action	Type	Setting code
Tint	Get		BE EF	03 06 00	49 73	02 00	03 22	00 00	
	Increment		BE EF	03 06 00	2F 73	04 00	03 22	00 00	
	Decrement		BE EF	03 06 00	FE 72	05 00	03 22	00 00	
Video Format	Set	Auto	BE EF	03 06 00	9E 75	01 00	00 22	0A 00	
		NTSC	BE EF	03 06 00	FE 71	01 00	00 22	04 00	
		PAL	BE EF	03 06 00	6E 70	01 00	00 22	05 00	
		SECAM	BE EF	03 06 00	6E 75	01 00	00 22	09 00	
		NTSC 4.43	BE EF	03 06 00	5E 72	01 00	00 22	02 00	
		M-PAL	BE EF	03 06 00	FE 74	01 00	00 22	08 00	
	N-PAL	BE EF	03 06 00	0E 71	01 00	00 22	07 00		
	Get		BE EF	03 06 00	0D 73	02 00	00 22	00 00	
HDTV	Set	1080i	BE EF	03 06 00	F2 73	01 00	05 22	00 00	
		1035i	BE EF	03 06 00	62 72	01 00	05 22	01 00	
	Get		BE EF	03 06 00	C1 73	02 00	05 22	00 00	
Sync on G	Set	off	BE EF	03 06 00	CB D0	01 00	08 30	01 00	
		on	BE EF	03 06 00	5B D1	01 00	08 30	00 00	
	Get		BE EF	03 06 00	68 D1	02 00	08 30	00 00	
WHISPER	Set	NORMAL	BE EF	03 06 00	3B 23	01 00	00 33	00 00	
		WHISPER	BE EF	03 06 00	AB 22	01 00	00 33	01 00	
	Get		BE EF	03 06 00	08 23	02 00	00 33	00 00	
GAMMA	Set	NORMAL	BE EF	03 06 00	C7 F0	01 00	A1 30	00 00	
		CINEMA	BE EF	03 06 00	57 F1	01 00	A1 30	01 00	
		DYNAMIC	BE EF	03 06 00	A7 F1	01 00	A1 30	02 00	
	Get		BE EF	03 06 00	F4 F0	02 00	A1 30	00 00	
Lamp Time	Get		BE EF	03 06 00	C2 FF	02 00	90 10	00 00	
Filter Time	Get		BE EF	03 06 00	C2 F0	02 00	A0 10	00 00	

Intended Use

Before operating this machine, please read this entire manual thoroughly. The 3MTM Multimedia Projectors are designed, built, and tested for use indoors, using 3M lamps, 3M ceiling mount hardware, and nominal local voltages.

The use of other replacement lamps, outdoor operation, or different voltages has not been tested and could damage the projector peripheral equipment and/or create a potentially unsafe operating condition.

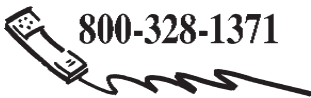
3M Multimedia projectors and Wall Display Systems are designed to operate in a normal office environment.

- 16° to 29°C (60° to 85° F)
- 10- 80 %RH (without condensation)
- 0- 1828 m (0-6000 feet) above sea level

The ambient operating environment should be free of airborne smoke, grease, oil and other contaminants that can affect the operation or performance of the projector.

Use of this product in adverse conditions will void the product warranty.

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