Smart-e

444K-4x4-L

18Gbps 4:4:4 4x4 HDMI/HDBaseT Matrix

User manual







For more information visit our website, or talk to one of our technical team tel: +44 (0) 1306 628264 www.smart-e.co.uk



Thank you for purchasing this product. For optimum performance and safety, please read these instructions carefully before connecting, operating or adjusting this product. Please keep this manual for future reference.

SURGE PROTECTION DEVICE RECOMMENDED

This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lightning strikes, etc. Use of surge protection systems is highly recommended in order to protect and extend the life of your equipment.

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1. Features

- Incorporate HDBaseT technology
- 1 4 x HDMI input and 4 x HDBaseT output with 4 x HDMI Loop out
- HDMI 2.0 version support 4K@60Hz YUV4:4:4, 8bit, 18G, HDR10
- Transmit up to 70m under 1080p, 40m under 4K@60Hz
- I HDCP 2.2/1.4 compliant
- With wide-band Bi-Direction IR routed control(38~56KHz)
- 3 Support 4x Analog Audio input
- Support 4x Analog Audio and 4x SPDIF Audio extraction output
- Support Panel Button with LCD, IR Routing, RS232, TCP/IP, PC Tool Control
- Support POC (Receiver powered by HDBaseT Matrix)
- Support Micro USB for FW updating

2. Package Contents

- 1) 1x Main Unit (HDBaseT Matrix)
- 2) 1x DC24V4A Power adapter
- 3) 1x Remote control
- 4) 5xIR Transmitter cables, 5x Wide-Band IR Receiver cables
- 5) 1x CD for control software & user manual & Command list
- 6) 4x 3Pin plug for Analog audio output
- 7) 1U rack design metal case with 2 mounting ear

3. Specifications

Operating Temperature Range	-5 to +40°C(23 to +104 °F)
Storage Temperature Range	-10 to +60°C(-14 to +140 °F)
Operating Humidity Range	5 to 90 $\%$ RH (no condensation)
Input Video Signal	0.5-1.0 volts p-p
Input DDC Signal	5 volts p-p (TTL)
Bandwidth	18Gbit/s
Video Format Supported	4K@60Hz,YUV4:4:48bit
Video Format Supported	4k@30Hz/1080P/1080i/720P/576P/480P/57
HDCP Compliant	HDCP2.2 and HDCP1.4
Output Video	HDMI2.0 and HDMI 1.4 (over HDBaseT and HDMI)
Audio Format Supported	PCM, Dolby5.1, DTS5.1 digital audio
Maximum Transmission Distance	1080P 70m, 4K 40m
Power Consumption	68 watts (Max.)
Dimensions	L438 x W394 x H44 mm
Mass (Main Unit)	ЗKG

4. Panel Descriptions



9 Grounding

5. Wiring Diagram



4X8 HDBaseT Matrix 18gbps Initializing...

6. Input / output channel key operation

Channel	Button method
	1. Directly press the number key, such as input channel 1, and select "1" to press
Input 1-4	(only when the output port is selected, the input channel number will be valid)
	2. Long press means all outputs select current input
	Directly press the number key, such as the output channel 2, press button "2" and
Output 1-4	press it again to cancel the selection;
	Long press output 4 to select all channels, and long press again to cancel
MENU	Function Button; Enter the function option or back to previous option
ENTER	Confirm Button: enter function selection mode
UP	Button for UP option
DOWN	Button for NEXT option
PRESET	Preset, short press to quickly enter the preset call function
LOCK	Long press to LOCK, Long press again to UNLOCK

7. Video switching operation

7.1. Video switch

The signal switch includes 4 free switching channels, which can be configured as input/output according to the requirements, forming a matrix of 1 x 4 \sim 4 x 1, which can switch any input.

Signal to 1 channel output or all channel output.

The specific operation as follows:



Switch the input to the output

Operation format: "output channel" + "input channel"

For Example: Output port 2 switch to input 1

Operation: Press OUT number "2" + IN number "1" to complete the switch

7.2. Video Control

The video interface have two sub menu

- 1. Video Routing
- 2. Video On/Off

Menu>			
1/6		0/2	
Video	>	Switching	>
Audio	>	On/Off	>
EDID	>		
Preset	>		
Setup	>		

The specific operation as follows:

1.Video Switch

Switch any output to one input or all outputs to the same input, default PTP. (1)Select"Video"in the menu and press"ENTER"

(2) Then use "UP"" DOWN" button to select "Switching"

(3)Press"ENTER" enter next page

(4) Press "UP""DOWN" button to select the output (The fifth port means ALL)

(5)Press"ENTER"

6 Press "UP""DOWN" to select the input

7)Press"ENTER", Switch Done



2.Video On/Off

Turn on/off any output video or all outputs video

(1) Select"Video"in the menu and press"ENTER"

2 Then use "UP""DOWN"button to select"On/Off"

(3) Press"ENTER"enter next page

(4) Press "UP""DOWN" button to select the output (The 9th port means ALL)

(5) Press"ENTER"to select the HDMI 1~4; HDBT 1~4

6 Press "UP""DOWN"to select "On"or "Off"

7 Press"ENTER", Switch Done

Menu>	Video>	On/Off>	
/9		0/2	
Dutput1	>	Off	
Dutput2	>	On	@
Dutput3	>		
Dutput4	>		
Dutput5	>		

7.3. Audio Control

The Audio Control have three sub menu

- 1. Line Out
- 2. Audio Embed
- 3. Audio De-Embed

The specific operation is as follows:

1. Line Out

HDMI output audio switch. You can select a channel of HDMI output to mute the sound of the TV $\,$

2. Audio Embed

Audio can be embedded to HDMI input. The embedded sound will cover the original sound of the signal source. You can select any input to embed

3. Audio De-Embed

You can set the output audio (analog audio and coaxial audio) at the same time. You can choose a certain audio output or mute

Menu>		
2/6		0/3
Video	>	Line out >
Audio	>	De-Embed >
EDID	>	Embed >
Preset	>	
Setup	>	

3/3 Line out	>	0/5 Output1	>
Menu> Audio >			
		HDBT1	>
		HDMI4	>
Embed	>	HDMI3	>
De-Embed	>	HDMI2	>
Line out	>	HDMI1	>
1/3		0/9	
Menu> Audio >			

Line Out	>	Output	>	
De-Embed	>	Output2	>	
Embed	>	Output3	>	
		Output4	>	
		All	>	

3/3		0/5	
Line out	>	Input1	>
De-Embed	>	Input2	>
Embed	>	Input3	>
		Input4	>
		All	>

7.4. EDID Set Mode Interface

Default EDID

Default1	4K60 444-LPCM: 2.0 FXN1234	Default2	4K60 420-LPCM: 2.0 FXN1234
Default3	4K30 444-LPCM: 2.0 FXN1234	Default4	1080P60 444-LPCM: 2.0 FXN1234

EDID Mode can set each input's EDID, Include: Default EDID; User EDID; Copy EDID; Copy HDBT EDID.

Menu>			
3/6		0/5	
Video	>	Input1	>
Audio	>	Input2	>
EDID	>	Input3	>
Preset	>	Input4	>
Setup	>	All	>
Menu> E	DID>		
1/5		0/12	
Input1	>	Default1 @	
Input2	>	Default2	
Input3	> 1	Default3	
Input4	>	Default4	
All	>	User1	
Menu>	EDID>	Input1>	
1/12			
Default1	@	3840x2160@60 4	44
Default2	>	HDR:HLG	
Default3	>	LPCM: 2.0	
Default4	\$	FXN1234	
User1	>		

7.5. Preset Interface

The PRESET interface can save the current video, audio, EDID, system Settings, etc., and supports 8 different scenes. Scenes can be modified and cleared through web pages, commands, and panels. The default preset is consistent with factory Settings

Menu>				
4/6		0/3		
Video	>	Call	>	
Audio	>	Save	>	
EDID	>	Clear	>	
Preset	>			
Setup	>			
Menu> Pi	reset>			
Menu> Pi 1/3	reset>	0/8		
Menu > Pi 1/3 Call	reset>	0/8 Preset1	@	
Menu> Pr 1/3 Call Save	reset> > >	0/8 Preset1 Preset2	@	
Menu > Pr 1/3 Call Save Clear	reset> > > >	0/8 Preset1 Preset2 Preset3	@	
Menu > Pr 1/3 Call Save Clear	reset> > > >	0/8 Preset1 Preset2 Preset3 Preset4	@	

7.6. SETUP mode Interface

SETUP mode can set the device's RS-232 baud rate, POC Switch, DHCP, Reboot, Factory Specific operations are as follows

Menu>			
5/6		0/5	
Video	>	Baud	>
Audio	>	DHCP	>
EDID	>	POC	>
Preset	>	Reboot	>
Setup	>	Factory	>

7.6.1. RS-232 Baud Rate setting

It has 4 kinds of baud rates inside the device: 9600; 19200; 57600; 115200

Default Baud Rate is: 115200

1 Select "Setup" in the menu and press "ENTER"

(2) Then use "UP""DOWN" button to select the "BAUD" and press "ENTER"

(3) Press "UP""DOWN" button to select the baud rate and press "ENTER" to confirm

vienu> 3	setup>		
1/5		0/4	
Baud	>	115200	@
DHCP	>	57600	
РОС	>	19200	
Reboot	>	9600	
Factory	>		

7.6.2. DHCP On/Off setting

On means Dynamic; Off means Static

(1)Select"Setup"in the menu and press"ENTER"

(2) Then use "UP""DOWN" button to select the "DHCP" and press "ENTER"

③Press "UP""DOWN"button to select"On"or"Off"and press "ENTER"to confirm



7.6.3. POC power switch

The POC interface can select a certain HDBT output switch to control POC power supply, and the default POC is "On"

Menu>Set	up >		
3/5		0/5	
Baud	>	HDBT1	>
DHCP	>	HDBT2	>
POC	>	HDBT3	>
Reboot	>	HDBT4	>
Factory	>	All	

7.6.4. Reboot setting

Menu>Set	up >		
4/5		0/2	
Baud	>	No	@
DHCP	>	Yes	
POC	>		
Reboot	>		
Factory	>		

7.6.5. Factory setting

Factory Run: Reset Video, Audio, EDID, Setup setting, Preset, Device name. Factory User: Reset Video, Audio, EDID, Setup setting.

5/5		0/2	
Baud	>	Run	>
OHCP	>	User	>
POC	>		
Reboot	>		
Factory	>		



7.7. INFO mode Interface

Check the device information: IP or System information

Menu>			
5/5		0/2	
Video	>	System	
Audio	>	IP	
EDID	>		
Setup	>		
INFO.	>		

Menu > INFO. >		
1/2		
System C	0. xxx	
IP T	vpe xxx	
V	er v0.2.	
~		
Menu>INFO. >		
2/2		
System	DHCP	Off
IP	IP	192.168. 1.168
	MASK	252 . 255. 255. 0
	WG	192.168.1.1
	MAG	

8. Audio Extraction



HDMI audio output supports uncompressed audio PCM, compressed audio Dolby and DTS, with a maximum support of 7.1 sound channels and a maximum sampling rate of 192KHz. Analog audio supports PCM 2.0 channel.

S/PDIF audio supports Dolby or DTS, 5.1 channel.

9. Remote Control Description

(1)Standby Mode

2 Lock or Unlock the Panel Button
3 Choose output from 1-4
4 Choose all the outputs.
5 X: Turn on/off output port which you select
6 PTP button: Mirror all inputs and outputs

(Ex. Input 1 to output 1, input 2 to output 2, etc)

7 Choose input from 1-4

8 Menu (back to previous option) button

(9)UP and DOWN button (10)Enter button



10. IR system

The matrix can pass the IR signal through the IR system to the HDMI source or pass the IR signal from the HDMI source to the HDMI sink



Dual way IR using:

Step1: "IR IN" is for HDBaseT output, "IR OUT" is for input channel Step2: "IR IN ALL" Controlled by all input IR; "IR OUT ALL" Controlled by all output IR. Step3: HDBaseT receiver support connect with IR receiver to control the Matrix by remote Step4: Matrix IR channel "IR IN ALL" support connect with IR-RX cable to control the Matrix by remote



11. Command Control

Control software operation:

The serial control software is illustrated with SSCOM32 as an example. Basic Settings:



Double-click the software in the installation package to run specifically (as shown in figure 1 below) and install the RS232 software on the computer. **Enter the main interface of the software, as shown in the figure below.**

● SSCOM V5.12.1 串口/网络数据测试器,作者:习小量(大虾丁丁),2618058@qq.com. QQ群:52502	449	
通讯端口 串口设置 显示 发送 多字符串 小工具 帮助 回报作者 PCB打样		
Video 01 to 04.	多条字符串发送 stm32/GD32 1	ISP STC/IAP15 ISP
Video 01 to 06.	←拖动加宽 「循环发送 多	条帮助 导入ini aftet ▲
Video Di to D7. Video Di to D8	HEX 字符串(双击注释)	占击发i+1-1 ms
Video D1 to 09.	Help?	查询指令 1 1000
Video Di to 10. Video Di to 11.	UDI?	字符串1 3 1000
Video D1 to 12.	V:1>1;	視频切换 2 1000
Video D1 to 13.	▼ P:10/1/1;	4无注释 0 1000
Video D1 to 15.	E	5无注释 0 1000
Output 16 RGB&YFBPR resolution: 1920*1080F 50MZ.	Factory	6无注释 0 1000
Input to all.		7无注释 0 1000
Video 05 to 01. Video 05 to 02.		8无注释 0 1000
Video D5 to 03.	P:10/10/13;	9元汪科 0 1000
Video 05 to 04. Video 05 to 06.		10九汪粋 0 1000
Video 05 to 07.	P;10/1/4;	11元注释 0 1000
Video 05 to 08. Video 05 to 09.	P:10/10/90	12元注稿 0 1000
Video DS to 10.	P:10/10/90	14天注第 0 1000
Video US to 11. Video OS to 12.	- 1.10/10/00.	15天注释 0 1000
Video 05 to 13.	P:10/14/0:	16天注释 0 1000
Video 05 to 14. Video 05 to 15.	F	17无注释 0 1000
Video OS to 16.		18元注释 0 1000 ,
		107:747 In 1000
清除窗口 打开文件 发送文件 停止 清发送区	□ 最前 □ English 保存参数	扩展
端口号 COM2 Prolific USB-to-Seria • 厂 HEX显示 保存數据 厂 接收数据到文件 厂 HEX发送	定时发送: 50 ms/次 厂 か	加回车换行
● 关闭串口 き 更多串口设置 □ 加时间戳和分包显示, 目前时间 20 ms 第 1 字节至	ē末尾加校验:None 🔹	
▼ RTS 〒 DTR 波特率: 115200 _ P: 16/8/15:		*
【PCB打样】哪家强? 当然就是嘉立创![进入] 发送		+
欢迎使用专业串口调试工具SSCOM! 作者:习小猛(丁丁),大虾电子网贩主 最新版本下载地址: ht	tp://www.dazia.com/ 欢迎提出;	您的建议!请将建议发到26180
www.daxia.com S:371 R:4650 COM2 已打开 115200bps,8,1,None,None		CTS=0 DSR=0 R

In the parameter configuration area, select the serial port number that the serial line connects to the PC

Baud rate: 115200 (default) Data location: 8. Stop bit: 1 Check bit: no Then can input commands in the command input area to control the local or remote receiver

Instructions:

1. All commands start from "#", command head "%c": "d" parameters, "l" lock, "s" save.

2. The "_" in the commands cannot omit. Parameter: %d: 0 means ALL.

3. Command head & Parameter1 & Parameter2... need to add one "SPACE".

The following table is only an example. Please refer to the list of instructions.

Instruction description	instruction	parameter 1	parameter 2
Video switch	#video_d		
Audio Mode Switch	#audio_%c	in%d	enc=%d
EDID	#EDID_%c	ln%d	cfg=%d

Please refer to the "Command list" for details. Example: ALL output switches to input 4. Operation format: #video_d outO matrix=4

12. Web Control



1). Connect the Ethernet port of matrix to the Ethernet port on PC by a crossover cable with RJ45 connectors.

2). Configure your PC as follows:

- ① Click Start > Control Panel > Network and Sharing Center.
- ② Click Change Adapter Settings.
- (3) Highlight the network adapter you want to use to connect to the device and click **Change settings of this connection**.
- 3). The local Area commotion properties window for Network selection appears as below:
- 4). Click the Highlight Internet Protocol Version 4 (TCP/IPv4).
- 5). Click **Properties**.

6). Select **Use the following IP Address** for static IP addressing and fill in the details.

For TCP/IPv4 you can use any IP address in the range 192.168.1.1 to 192.168.1.255 (excluding

192.168.1.168].

7). Click **OK**.

8). Click Close. Default IP Address: 192.168.1.168 MASK: 255.255.255.0 Gateway:192.168.1.1 MAC:0008-DCCA-CF3F

		1	General	
Connect using:			You can get IP settings assig	aned automatically if your network supports
1ntel(R) 82579V	Gigabit Network Conn	ection	this capability. Otherwise, y for the appropriate IP settin	ou need to ask your network administrator gs.
T		Configure	Obtain an IP address a	utomatically
This connection uses t	ne following items:		 Use the following IF ad 	dress:
✓ Tuent for Microsoft Net	osoft Networks work Monitor 3 Driver		IP address:	192.168.1.2
QoS Packet	Scheduler		Subnet mask:	255 . 255 . 255 . 0
File and Printe	er Sharing for Microsoft	Networks	Default gateway:	
 Internet Proto Internet Proto 	col Version 4 (TCP/IP	v6) v4)		· · ·
🗹 斗 Link-Layer To	pology Discovery Map	per I/O Driver	Obtain DNS server add	ress automatically
 Link-Layer To 	pology Discovery Res	ponder	Our Search State Stat	server addresses:
Install	Uninstall	Properties	Preferred DNS server:	
Description			Alternate DNS server:	
	he latest version of the unication across divers	e internet protocol se interconnected	The state of the section of the sect	

12.1. Enter Web and Control

Enter the default IP address of the matrix: 192.168.1.168 Account: admin Password: admin

12.2. "Status" interface:

Input Info & Output Info & Device Info:

1. CONNECT: The input status display bar. After connecting with the device, it will check whether the current input terminal has access signal source.

When no signal source connected, it will be displayed as " \times ", and when there is a normal working signal source connected, it will be displayed as " $\sqrt{}$ ".

2. AUDIO-EMBED: The Audio Embed status display bar. After connecting with the device, it will check whether the current HDMI output terminal has Audio Embed.

When audio is not embedded, it will be displayed as "x". When audio is embedded, it will be displayed as " $\sqrt{}$ ".

3. Connect (Local) and (Remote): It will be displayed as "X" when there is no display device access, and " $\sqrt{}$ " when there is display device access.

4. Audio De-Embed: Indicates if Audio separation is turned on. "X": means off. " $\sqrt{}$ ": means on

5. Audio HDMI & HDBT: Indicates if the current local (HDMI) / Remote (HDBT) Audio output is available. When the HDMI/HDBT Audio output is turned off, displayed as " \times ", and when the HDMI/HDBT Audio output is turned on, displayed as " $\sqrt{}$ ".

6. POC (Remote): "ON" "OFF" means POC turned on or off

7. HTML Version: Current WEB Version

	Input Info						
		Co	nnect		Audio-E	mbed	
tus	in1		V		×		
	In2		٧		×		
	In3		√		×		
	In4		v (×		
ıt	0.1.11.0						
	Output Info						
		Connect(Local)	Connect(Remote)	Audio De- Embed	Audio- HDMI	Audio- HDBT	POC(Remote)
	Out1	√	V	√	V	1	OFF
	Out2	√	√	√	1	1	OFF
c.	Out3	√	√	V	1	1	OFF
	Out4	√	V	√	√	1	OFF
	Device Info						

12.3. "Input" interface:

Noted: Double Click the Rename column can change the name of the ports.

Input Input Rename Audio-Embed
Output Int Input1
In2 Input2
Preset In3 Input3
User EDID Ind Input4
Network
Sector

12.4. "Output" interface:

15								
	Output	Rename	Video	/ideo HDBT	Audio De-	Audio HDMI	Audio	Source
	Out1	Output1		0	Embed	0	0	In1:CHANGHONG
	Out2	Output2)	0	0	0	In1:CHANGHONG
	Out3	Output3		0	0	0	0	In1:CHANGHONG
	Out4	Output4			0	0	0	In1:CHANGHONG
	All		0		0	0	0	In1:CHANGHONG

12.5. "Preset" interface:

IS	Preset	Rename	Save	Call
	Preset1	Preset1	Save	Call
	Preset2	Preset2	Save	Call
	Preset3	Preset3	Save	Call
	Preset4	Preset4	Save	Call
	Preset5	Preset5	Save	Call
	Preset6	Preset6	Save	Call
	Preset7	Preset7	Save	Call
	Preset8	Preset8	Save	Call

12.6. "User EDID" interface:

Status			
Input	User	Copy EDID From	
Output	User1	Select The EDID Information:	•
	User2	Select The EDID Information:	•
Preset	User3	Select The EDID Information:	•
User EDID	User4	Select The EDID Information:	•
Network			
System			

12.7. "Network" interface:

Status	
* 2011 V	
Input	Mac Address :
Output	IP Address :
Output	New Marcels & Holdson V
Preset	Net Mask Address .
110300	Gate Way Address :
User EDID	DHCP
Network	
System	

12.8. "System" interface:

Status	A	ccount management	
Innut		User Name :	
Input		New Password :	
Output		Confirm the Password :	
Preset			Apply
User EDID		Reboot :	Reboot
Network		User Reset :	Factory User
System		Factory Reset :	Factory Run

13. FW UPGRADE

First upgrade MCU (layer of application) and then upgrade CPLD, finally upgrade HTML (web page), (CPLD, HTML, MCU all support to use USB Micro port for upgrading)

A1 means MCU C0 means CPLD F0 means HTML

13.1. MCU Upgrade:

Open the software UART_ISP_V1.6.exe on PC, select the correct port and baud rate 115200, enter "A1" in Port, then select the path of the program in PATH (XXX. Bin), and click UPDATA to complete the upgrade

UART_ISP V1.6	(<u>***</u>	
MCU Fw encrypt		BAUD
COM21 USB-SERIAL CH340	~	115200 ~
PORT		
Al		REFRESH
PATH		
		UPDATA
00000 MCU fw is encrypted		^
File start : UX3000		
Send aras		
lck eras ok !		
Send data		
Ack data ok !		
Send stop		
Ack stop ok !		
Spend time : 38546 ms		
### Succeed ! ###		
### Succeed ! ###		

13.2. CPLD Upgrade:

Open the software UART_ISP_V1.6.exe on PC, select the correct port and baud rate 115200, enter "CO" in Port, then select the path of the program (XXX. VME) in PATH, and click UPDATA to complete the upgrade

COM COM	BAUD
COM21 USB-SERIAL CH340	× 115200
PORT	
C0	REFRESH
PATH	
	UPDATA
File crc : ED264DAD	UPDATA
File crc : ED264DAD 00000 CPLD fw is crypted Send link COAck link ok !	UPDATA
File crc : ED264DAD 00000 CPLD fw is crypted Send link COAck link ok ! Send eras Ack eras ok !	UPDATA
File crc : ED264DAD 00000 CPLD fw is crypted Send link COAck link ok ! Send eras Ack eras ok ! Send data	UPDATA
File crc : ED264DAD 00000 CPLD fw is crypted Send link COAck link ok ! Send eras Ack eras ok ! Send data Ack data ok ! Send stop	UPDATA
File crc : ED264DAD 00000 CPLD fw is crypted Send link COAck link ok ! Send eras Ack eras ok ! Send data Ack data ok ! Send stop Ack stop ok !	UPDATA

13.3. HTML (WEB GUI) Upgrade:

Open the software UART_ISP_V1.6.exe on PC, select the correct port and baud rate 115200, enter "FO" in Port, then select the path of the program [XXX. HTML] in PATH, and click UPDATA to complete the upgrade

UART_ISP V1.6	<u></u> 23	
HIML FW		BAUD
COM21 USB-SERIAL CH340	~	115200 ~
PORT		
FO		REFRESH
PATH		
		UPDATA
File size : 87.198		-
File crc : 88D46A2A Send link F0 Ack link ok /		
Send eras		
Ack eras ok !		
Send data		
Ack data ok !		
Send stop		
ACK Stop oK !		
Spend time : 10/81 MS		
*** JUCCER : ###		

MAINTENANCE

Clean this unit with a soft, dry cloth. Never use alcohol, paint thinner of benzine to clean this unit.

PRODUCT SERVICE

(1) Damage requiring service:

The unit should be serviced by qualified service personnel if:

(a) The DC power supply cord or AC adaptor has been

- damaged; (b) Objects or liquids have gotten into the unit;
- (c) The unit has been exposed to rain;

(d) The unit does not operate normally or exhibits a marked change in performance; The unit has been dropped or the cabinet damaged.

(2) **Servicing Personnel:** Do not attempt to service the unit beyond that described in these operating instructions.Refer all other servicing to authorized servicing personnel.

(3) **Replacement parts:** When parts need replacing ensure the servicer uses parts specified by the manufacturer or parts that have the same characteristics as the original parts. Unauthorized substitutes may result in fire, electric shock, or other Hazards.

(4) **Safety check:** After repairs or service, ask the servicer to perform safety checks to confirm that the unit is in proper working condition.

WARRANTY

If your product does not work properly because of a defect in materials or workmanship, our Company (referred to as "the warrantor") will, for the length of the period indicated as below, (Parts and labour 3 Years which starts with the date of original purchase ("Limited Warranty period"), at its option either(a) repair your product with new or refurbished parts, or (b) replace it with a new of a refurbished product. The decision to repair or replace will be made by the warrantor.

During the "Labor" Limited Warranty period there will be no charge for labor.

During the "Parts" warranty period, there will be no charge for parts. You must mail-in your product during the warranty period. This Limited Warranty is extended only to the original purchaser and only covers product purchased as new. A purchase receipt or other proof of original purchase date is required for Limited Warranty service.