



# SERVICE MANUAL

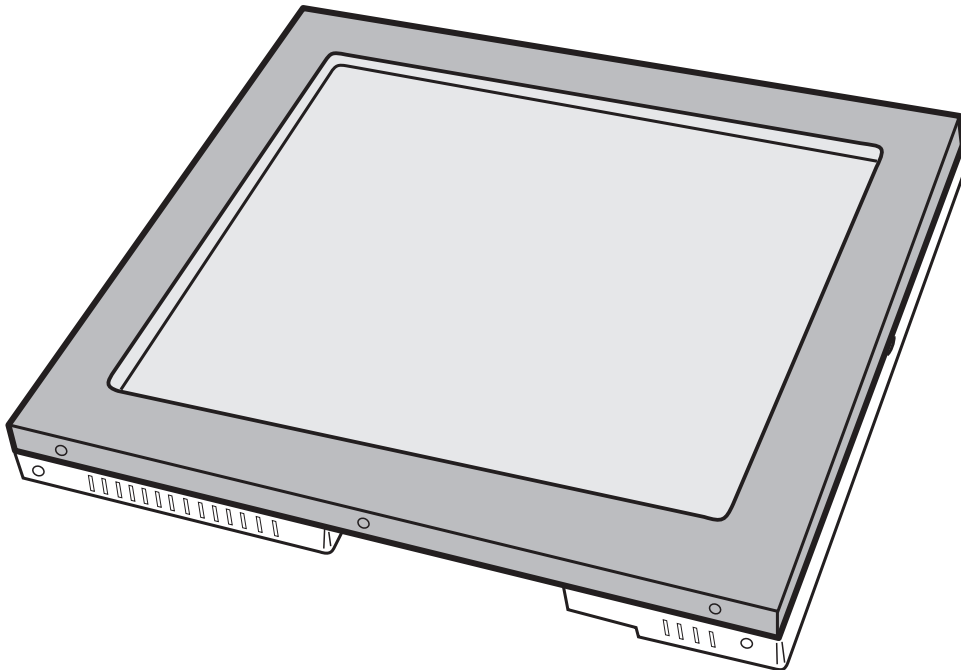
INDUSTRIAL MONITOR

LMU-TK18AG2 (Without Touch Panel)

LMU-TK18AG2TC (With Touch Panel)

(GENERAL)

PRODUCT CODE No.	
LMU-TK18AG2	1 938 102 48
LMU-TK18AG2TC	1 938 102 56



REFERENCE NO. SM 920014  
REFERENCE NO. SM 920015

PRODUCT CODE NO.193810248  
PRODUCT CODE NO.193810256

# INDEX

<b>PRECAUTIONS</b> .....	<b>Page</b> <b>2</b>
<b>1, MAIN SPECIFICATION</b> .....	<b>3</b>
<b>2, TROUBLE SHOOTING</b> .....	<b>4,5</b>
<b>3, MAINTENANCE</b>	
<b>3-1 LMU-TK18AG2</b> .....	<b>6</b>
<b>3-2 LMU-TK18AG2TC</b> .....	<b>7</b>
<b>4, BLOCK DIAGRAM</b> .....	<b>8</b>
<b>5, CONNECTION DIAGRAM</b> .....	<b>9</b>
<b>6, TABLE OF SIGNAL NAME</b> .....	<b>10,11</b>
<b>7, EXPLODED VIEW AND PARTS LIST</b>	
<b>7-1 Exploded View</b> .....	<b>12</b>
<b>7-2 Parts List</b>	
<b>7-2-1 LMU-TK18AG2</b> .....	<b>13</b>
<b>7-2-2 LMU-TK18AG2TC</b> .....	<b>14</b>
<b>8, APPENDEX</b> .....	<b>15</b>

Refer to the separate volume User's Manual and CD-ROM that included for instruction.

# **PRECAUTIONS**

## **Placement precautions**

Avoid placing the unit in humid or dusty places, or where it will be exposed to excessive heat (direct sunlight, heaters, etc.)

Do not step on or set anything on the AC cord.

**DAMAGE TO THE AC CORD IS A SAFETY RISK AND CAN CAUSE A FIRE.**

Do not connect the unit to the same AC as outlet with appliances that generate large amounts of interference (such as heaters with thermostats, appliances with motors, etc.). It is best to use a completely separate electrical outlet.

Keep the unit away from water. If water accidentally enters the unit, unplug the AC power cord immediately. **DO NOT PLUG IN THE UNIT AGAIN.**

## **Handling precautions**

Avoid bending, kinking or damaging the AC power cord.

Never insert or remove the power cord with wet hands. Also, be sure to hold cord by the plug when removing it from the outlet.

Do not remove any parts that are held in place with screws. (The unit does not contain any user serviceable items.)

Maintain standard room temperature (5°C to 35°C, or 41°F to 95°F) during use. Do not subject the unit to shock or vibration. Do not move the unit while it is in use.

A rapid increase in room temperature in cool weather can cause condensation to form inside the unit. If this occurs, wait at least 15 minutes after turning the unit on before attempting to operate it.

## 1. MAIN SPECIFICATION

Model Name		LMU-TK18AG2TC	LMU-TK18AG2
Display			
Panel Type		TFT	
Screen Size		18.1"	
Pixel Pitch		0.2805 x 0.2805 mm	
Effective Viewing Area		359.04 x 287.232 mm	
Pixel Format		1,280 x 1,024 (SXGA)	
Brightness		200cd/m <sup>2</sup> typ.	
Response Time		75ms	
Contrast		300 : 1 typ.	
Viewing Angle (minimum)		Left & Right :85 deg Up : 85 deg Down : 85 deg	
Back Light		CCFL x 2	
Lamp Life Time		50,000 hours typ.	
Video Control			
Input Signal	System	Analog RGB	
	Video	0.7Vp-p 75 ohm	
	Sync.Type/Level	Separate TTL (+/-)	
Synchronization Frequencies	Horizontal	31.4 kHz – 80 kHz	
	Vertical	56 - 75 Hz	
Colors		16.77million	
Touch Panel			
Type		Capacitive	-
Electrical Resolution		10bit (1,024 x 1,024)	-
Communication		Bi-directional asynchronous RS-232C serial communication	-
Baud rate		9,600 BPS (1,200 - 19,200 BPS)	-
Data		7 bit (7bit or 8bit)	-
Stop bit		2 bit (1bit or 2bit)	-
Parity		non (odd, even, or non)	-
Touch Life		150 million touches in any location.	-
Touch Down Speed		15 ms	-
Physical			
Input	Video Signal	15pin mini D-Sub	
	Serial	9pin D-Sub	-
	Power Supply	DC Jack	
Environment	Operating Temperature	operating : 5 deg to 35 deg	
		Storage : -20 deg to 60 deg	
	Humidity	30% to 85% RH (No Condensation)	
Power Supply (AC Adapter)	Model Name	SEA60N3-13.8A	
	Input	100-240VAC 50-60Hz	
	Output	DC 13.8V 3.5A	
Power Supply Consumption		53W max.	49W max.
		2W in Energy Saving mode	1.5W in Energy Saving mode
Dimensions		446(W) X 368(D) X 65(H) mm	446(W) X 368(D) X 58.5(H) mm
Weight		6.7 kg	5.3 kg
Accessories		AC Adapter, Power Cord, RGB cable, Serial cable, OSD control box, Touch Ware CD-ROM, User's Guide	AC Adapter, Power Cord, RGB cable, OSD control box, User's Guide

## 2. TROUBLESHOOTING

Check the following for troubles of LCD monitor.

No.	Symptom	Check Points	Treatments	Class
1	No Picture with Back light OFF			
	1	Is the Power "ON" to a LCD Monitor ?	Check AC outlet, AC cord, DC Jack and Power switch for a LCD monitor	A
	2	Is the Power "ON" to a Computer ?	Check the Power for a Computer	A
	3	Is a signal cable connected securely ?	Check the connection of a signal cable	A
	4	Is a computer standing by ?	Be out of standing by condition, by operating to a computer	A
	5	Disconnected a signal cable ? or Bent a terminal pin ?	Ensure the connection of a signal cable	B
	6	Is an AC Adapter defective?	Replace an AC Adapter with the new one	C
	7	Is the wire harness between main PCB and LCD module secured firmly ?	Check the connection of wire harness	C
	8	Is the wire harness between LCD module and DC/DC Comnv. secured firmly ?	Check the connection of wire harness	C
	9	Is the wire harness between DC IN PCB and DC/DC Conv. PCB secured firmly ?	Check the connection of wire harness	C
	10	Is the wire harness between main PCB and DC IN PCB secured firmly ?	Check the connection of wire harness	C
	11	Is the LCD module defective ?	Replace a LCD module with the new one	C
	12	Is the Inverter block on LCD module defective ?	Replace a LCD module with the new one	C
	13	Is the DC/DC Conv. PCB defective ?	Replace a DC/DC Conv. PCB with the new one	C
	14	Is the display circuit on main PCB defective ?	Replace the main PCB with the new one	C
15	Is the Power Supply circuit on main PCB defective ?	Replace the main PCB with the new one	C	
2	No Picture with Back light ON			
	1	Is a screen saver programming running ?	Press any key or touch the mouse, to end the screen saver program	A
	2	Is the computer's signal timing not agreeable to the LCD's specification ?	Adjust the computer's signal timing, if possible	B
3	Is the Image Processing circuit on main PCB defective ?	Replace the main PCB with the new one	C	
3	White/Grey on whole screen(Nothing on screen)			
	1	Is the wire harness between main PCB and LCD module secured firmly ?	Ensure the connection of wire harness	C
	2	Is the LCD module defective ?	Replace a LCD module with the new one	C
3	Is the Image Processing block circuit on main PCB defective ?	Replace the main PCB with the new one	C	

A It is possible to treated by end-user

B It might be possible to treat by end-user in some case.

C It must be treated by Professional Technical Staff

No.	Symptom	Check Points	Treatments	Class
6	Dark screen			
	1	Is the wire harness between inverter and a LCD module secured firmly ?	Ensure the connection of a wire harness	C
	2	Is the wire harness between one of inverters and main PCB secured firmly ?	Ensure the connection of a wire harness	C
	3	Is the display circuit on main PCB defective ?	Replace the main PCB with the new one	C
7	Screen's display range is incorrect			
	1	Is the adjustment for screen performed correctly ?	Adjust the screen correctly	A
	2	Is the output level on image from a computer not agreeable to LCD's specification ?	Check the specification of a computer	B
	3	Is the size of screen set correctly ?	Set the size of screen again(refer to User's Manual for computer)	A
8	Screen is distorted			
	1	Is the adjustment for screen performed correctly ?	Adjust the screen correctly	A
	2	Is a signal cable connected securely ?	Check the connection of a signal cable	A
	3	Is a signal cable extended ?	Don't extend a signal cable	A
	4	Is the output level on image from a computer not agreeable to LCD's specification ?	Check the specification of a computer	B
	5	Is the Image Processing circuit on main PCB defective ?	Replace the main PCB with the new one	C
9	Part of colors (R/G/B) is not displayed. Black line appears in vertically			
	1	Is a signal cable connected securely ?	Check the connection of a signal cable	A
	2	Is the connection between main PCB and a LCD module securely ?	Ensure the connector of wire harness	C
	3	Is the Image Processing circuit on main PCB defective ?	Replace the main PCB with the new one	C

---

A It is possible to treated by end-user

B It might be possible to treat by end-user in some case.

C It must be treated by Professional Technical Staff

---

### 3. MAINTENANCE

#### 3-1 LMU-TK18AG2

Disassembling the major components

(1) Cabinet

- 1.Unscrew to secure the cabinet (10-position)
- 2.Pull the cabinet upward to remove it

(2) LCD Panel

- 1.Unscrew to secure the LCD Panel (4-position)
- 2.Pull the LCD Panel and pull two connectors out from inverter unit
- 3.Disconnect two cables from the Main PCB
- 4.Unscrew to secure the earth terminal (1-position)

(3) Main PCB

- 1.Pull a RGB signal cable out
- 2.Unscrew to secure the Main PCB (7-position)
- 3.Disconnect the cables on the Main PCB (7-position)
  - / Two connectors from the LCD Panel
  - / One connector from the Switch PCB
  - / One connector from the VR PCB
  - / One connector from the DC-IN PCB
  - / Two connectors from the Inverter PCB on LCD
- 4.Unscrew to secure the bracket for RGB connector (2-position)

(4) Driver PCB

- 1.Unscrew to secure the Driver PCB (2-position)
- 2.Disconnect the cable from the Inverter PCB
- 3.Disconnect the cable from the DC-IN PCB

(5) Connector PCB

- 1.Unscrew to secure the Connector PCB (2-position)
- 2.Disconnect the cable from the Main PCB

(6) VR PCB

- 1.Unscrew to secure the VR PCB (2-position)
- 2.Disconnect the cable from the Main PCB

(7) DC-IN PCB

- 1.Unscrew to secure the DC-IN PCB (2-position)
- 2.Disconnect three cables, one from power switch, one from Driver PCB and one from the Main PCB

(8) Power Switch

- 1.Remove the power switch, while pressing the hook of the power switch

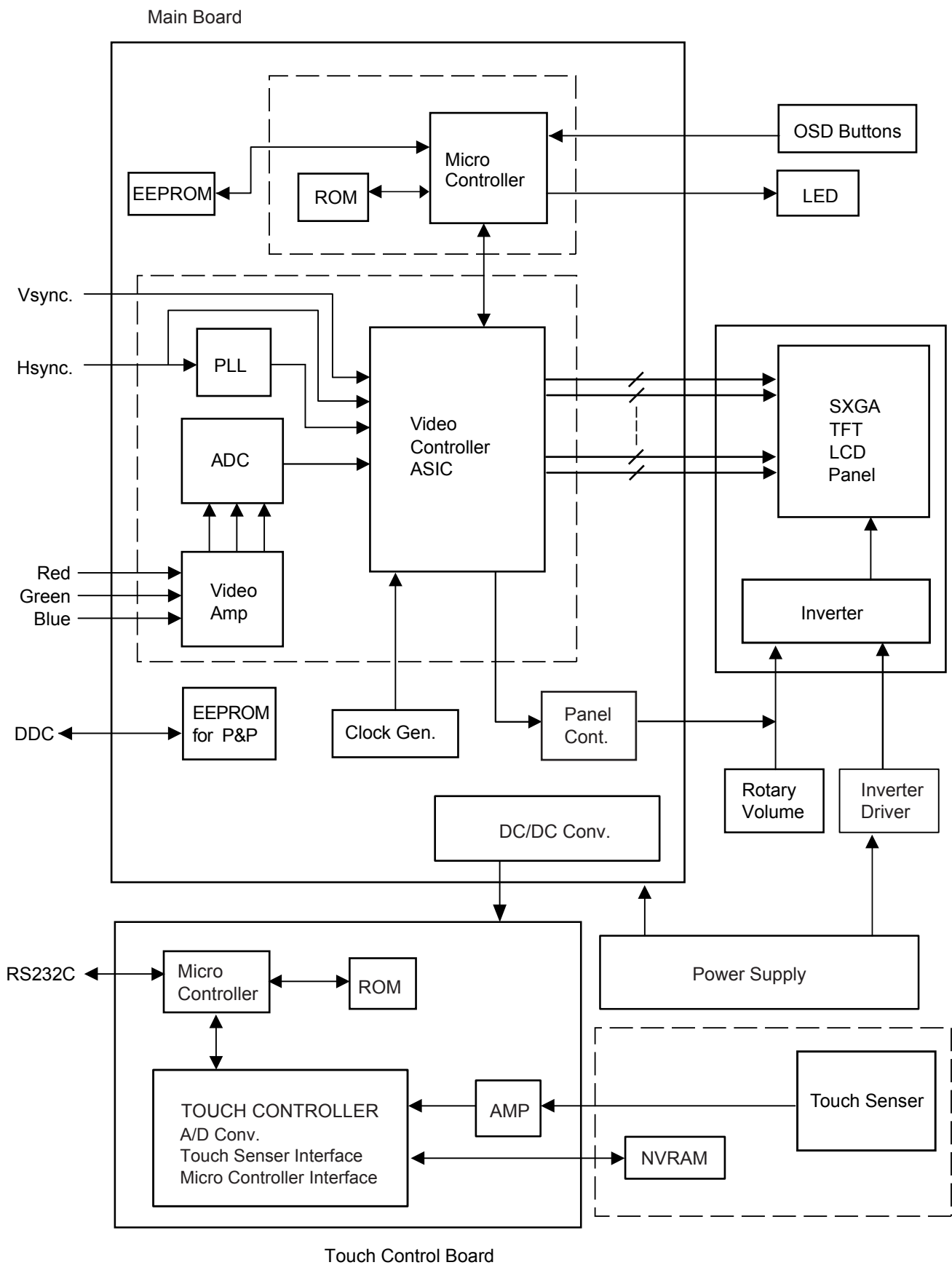
### **3-2 LMU-TK18AG2TC**

Disassembling the major components

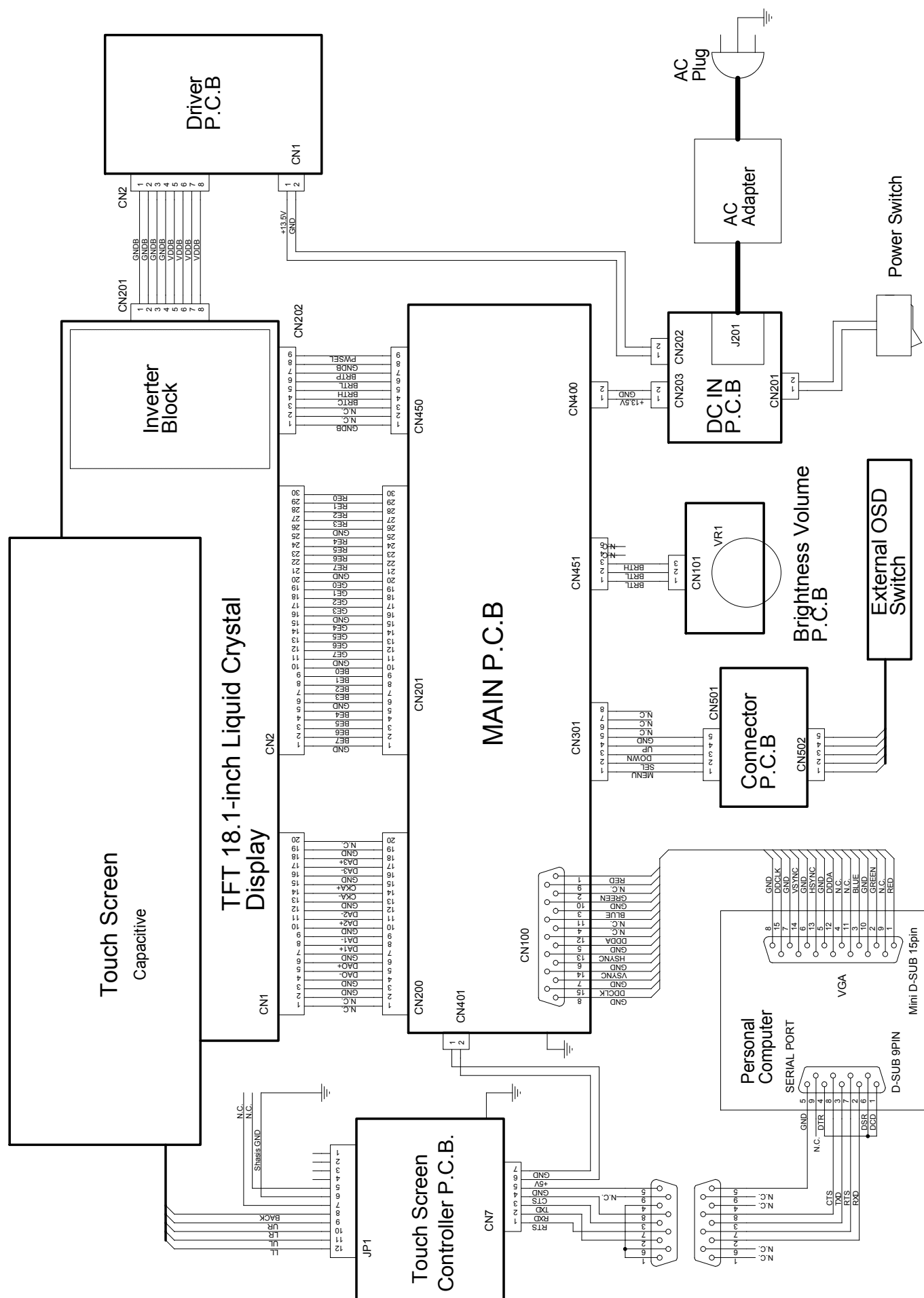
- (1) Cabinet
  - 1.Unscrew to secure the cabinet (10-position)
  - 2.Pull the cabinet upward to remove it
- (2) LCD Panel and Touch Panel
  - 1.Unscrew to secure the bracket for Touch Panel (8-position) and remove the brackets
  - 2.Unscrew to secure the LCD Panel (4-position)
  - 3.Pull the Touch Panel and LCD Panel up  
and pull two connectors out from inverter unit
  - 4.Disconnect two cables from the Main PCB
  - 5.Unscrew to secure the earth terminal (1-position)
  - 6.Disconnect the cable on the Touch Controller PCB
- (3) Main PCB
  - 1.Pull a RGB signal cable out
  - 2.Unscrew to secure the Main PCB (7-position)
  - 3.Disconnect the cables on the Main PCB (8-position)
    - / Two connectors from LCD Panel
    - / One connector from the Switch PCB
    - / One connector from the VR PCB
    - / One connector from the DC-IN PCB
    - / Two connectors from the Inverter PCB on LCD
    - / One connector from the Touch Controller PCB
  - 4.Unscrew to secure the bracket for RGB connector (2-position)
- (4) Driver PCB
  - 1.Unscrew to secure the Driver PCB (2-position)
  - 2.Disconnect the cable from the Inverter PCB
  - 3.Disconnect the cable from the DC-IN PCB
- (5) Touch Controller PCB
  - 1.Unscrew to secure the Touch Controller PCB (2-position)
  - 2.Disconnect a serial cable
- (6) Serial Cable (Connector and Cable with bracket)
  - 1.Unscrew to secure the bracket for serial cable (2-position)
- (7) Connector PCB
  - 1.Unscrew to secure the Connector PCB (2-position)
  - 2.Disconnect the cable from the Main PCB
- (8) VR PCB
  - 1.Unscrew to secure the VR PCB (2-position)
  - 2.Disconnect the cable from the Main PCB
- (9) DC-IN PCB
  - 1.Unscrew to secure the DC-IN PCB (2-position)
  - 2.Disconnect three cables, one from power switch, one from Driver PCB and one from the Main PCB
- (10) Power Switch
  - 1.Remove the power switch, while pressing the hook of the power switch



## 4. BLOCK DIAGRAM



## 5. Connection Diagram



## 6. TABLE OF SIGNAL NAME

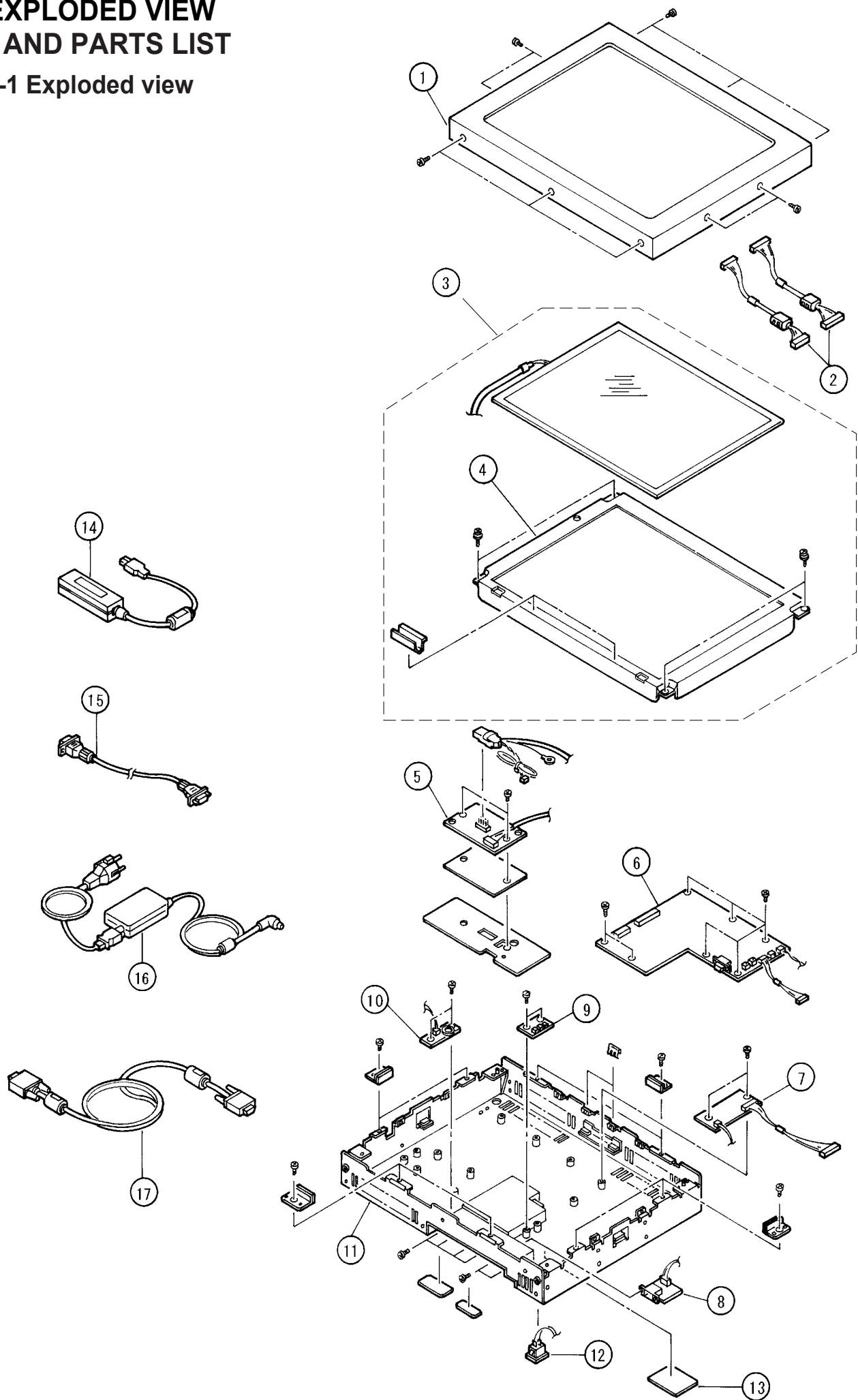
Symbol	Signal Name	Location	Notes
RED	RED/Analog Video Signal	CN100-1	
GREEN	GREEN/Analog Video Signal	CN100-2	
BLUE	BLUE/Analog Video Signal	CN100-3	
DDDA(ID1)	DDC Data	CN100-12	
HSYNC	Horizontal Synchronizing Signal	CN100-13	
VSYNC	Vertical Synchronizing Signal	CN100-14	
DDCK(ID3)	DDC Data Clock	CN100-15	
DB0-	Pixel Data-Even	CN200-5	LVDS level
DB0+	Pixel Data-Even	CN200-6	LVDS level
DB1-	Pixel Data-Even	CN200-8	LVDS level
DB1+	Pixel Data-Even	CN200-9	LVDS level
DB2-	Pixel Data-Even	CN200-11	LVDS level
DB2+	Pixel Data-Even	CN200-12	LVDS level
CKB-	Pixel Clock-Even	CN200-14	LVDS level
CKB+	Pixel Clock-Even	CN200-15	LVDS level
DB3-	Pixel Data-Even	CN200-17	LVDS level
DB3+	Pixel Data-Even	CN200-18	LVDS level
DA0-	Pixel Data-Even	CN201-5	LVDS level
DA0+	Pixel Data-Even	CN201-6	LVDS level
DA1-	Pixel Data-Even	CN201-8	LVDS level
DA1+	Pixel Data-Even	CN201-9	LVDS level
DA2-	Pixel Data-Even	CN201-11	LVDS level
DA2+	Pixel Data-Even	CN201-12	LVDS level
CKA-	Pixel Clock-Even	CN201-14	LVDS level
CKA+	Pixel Clock-Even	CN201-15	LVDS level
DA3-	Pixel Data-Even	CN201-17	LVDS level
DA3+	Pixel Data-Even	CN201-18	LVDS level
BRTC	B/BL/on/off	CN450-4	H: Back Light On L: Back Light Off
BRTH		CN450-5	
BRTL		CN450-6	
BRTP		CN450-7	
PWSEL	PWM select signal	CN450-9	
BRTH		CN450-5	
BRTL		CN450-6	
BRTP		CN450-7	
MENU	Menu Key Input	CN301-1	
SEL	Select Key Input	CN301-2	
DOWN	Down Key Input	CN301-3	
UP	Up Key Input	CN301-4	

**TouchScreen Controller**  
**(for LMU-TK18AG2TC only)**

RTS	Request To Send	JP1-1	
RXD	Receive Data	JP1-2	
TXD	Transmit Data	JP1-3	
CTS	Clear To Send	JP1-4	
DCD	Data Carrier Detect	NC	
DTR	Data Terminal Ready	NC	
GND	Signal ground	NC	
DSR	Data Set Ready	NC	
GND	Chassis (earth) ground	NC	
UR	Upper right (UR) corner	JP2-9	
LR	Lower right (LR) corner	JP2-10	
UL	Upper left (UL) corner	JP2-11	
LL	Lower left (LL) corner	JP2-12	


## 7. EXPLODED VIEW AND PARTS LIST

### 7-1 Exploded view






## 7-2 Parts List

### CAUTION

Parts marked as  Are very important to secure safety.  
In case of replacement, it is required to use designated parts for safety.




#### 7-2-1 LMU-TK18AG2

REF No		PART No.	DESCRIPTION	Q'ty	NOTES
OUTER					
		661 006 5927	OUTER CARTON	1	
INDIVIDUAL					
		661 004 2409	PAD, TOP	1	
		632 892 5001	ACCESSORY CASE	1	
		632 892 5018	PAD, ACCESSORY	1	
		661 006 5934	PAD, CONER UPPER	4	
		661 006 5941	PAD, CONER LOWER	4	
		632 878 8637	POLYETHYLENE BAG, 550X700	1	FOR MONITOR
		632 603 0998	POLYETHYLENE BAG, 130X500	1	FOR AC COAD
		632 298 2376	POLYETHYLENE BAG	1	FOR CNT BOX
		632 607 4824	POLYETHYLENE BAG, L 180X270	1	FOR USER'S GUIDE
		632 567 2588	POLYETHYLENE BAG, 200X300	1	FOR RGB CABL
ACCESSORY					
		661 006 5903	INSTRUCTION MANUAL, ENGLISH	1	
CABINET1					
1		661 012 7915	CABINET ASSY	1	
13		661 006 5958	RATING PLATE	1	
CHASSIS					
11		661 012 7922	CHASSIS ASSY, BOTTOM	1	
CHASSIS ELC.					
4		661 012 7939	LCD ASSY	1	
16		661 012 7946	AC ADAPTER ASS'Y	1	
2		661 012 7953	WIRE HANESS ASSY	1	
17		632 872 9494	VGA CABLE, 1.5M	1	
12		661 012 7960	SWITCH ASSY	1	
14		661 001 3164	REMOCON ASSY	1	
PC BOARD					
6		661 012 7977	PCB-ML ASSY, MAIN	1	
10		661 012 7984	PCB ASSY, VR1	1	
9		661 012 7991	PCB-W ASSY, DC-IN	1	
7		661 012 8004	PCB ASSY, DRIVER	1	
8		661 012 8011	PW BOARD ASS'Y, JOINT	1	

## **CAUTION**

Parts marked as ! Are very important to secure safety.  
In case of replacement, it is required to use designed parts for safety.

### 7-2-2 LMU-TK18AG2TC

REF No		PART No.	DESCRIPTION	Q'ty	NOTES
<b>OUTER</b>					
		661 006 5927	OUTER CARTON	1	
<b>INDIVIDUAL</b>					
		661 004 2409	PAD, TOP	1	
		632 892 5001	ACCESSORY CASE	1	
		632 892 5018	PAD, ACCESSORY	1	
		661 006 5934	PAD, CONER UPPER	4	
		661 006 5941	PAD, CONER LOWER	4	
		632 878 8637	POLYETHYLENE BAG, 550X700	1	FOR MONITOR
		632 603 0998	POLYETHYLENE BAG, 130X500	1	FOR AC COAD
		632 298 2376	POLYETHYLENE BAG	1	FOR CNT BOX
		632 607 4824	POLYETHYLENE BAG, L 180X270	1	FOR USER'S GUIDE
		632 567 2588	POLYETHYLENE BAG, 200X300	1	FOR RGB CABL
		632 607 4824	POLYETHYLENE BAG, L 180X270	1	FOR SERIAL CABLE
<b>ACCESSORY</b>					
		661 006 5903	INSTRUCTION MANUAL, ENGLISH	1	
		632 867 2325	CD-ROM DISK, TOUCHWARE	1	
<b>CABINET1</b>					
1		661 012 9087	CABINET ASSY	1	
13		661 006 5989	RATING PLATE	1	
<b>CHASSIS</b>					
11		661 012 9094	CHASSIS ASSY, BOTTOM	1	
<b>CHASSIS ELC.</b>					
4		661 012 9100	LCD ASSY	1	
3		661 012 9131	TOUCH SENSOR ASSY	1	
5		661 012 9148	SERIAL CONTROLLER ASSY	1	
16		661 012 7946	AC ADAPTER ASSY	1	
2		661 012 7953	WIRE HANESS ASSY	1	
17		632 872 9494	VGA CABLE, 1.5M	1	
15		661 012 9117	CABLE ASSY	1	
12		661 012 7960	SWITCH ASSY	1	
14		661 001 3164	REMOCON ASSY	1	
<b>PC BOARD</b>					
6		661 012 9124	PCB-ML ASSY, MAIN	1	
10		661 012 7984	PCB ASSY, VR1	1	
9		661 012 7991	PCB-W ASSY, DC-IN	1	
7		661 012 8004	PCB ASSY, DRIVER	1	
8		661 012 8011	PW BOARD ASS'Y, JOINT	1	

## APPENDIX

### Version of Firmware

The Version of Firmware is displayed on screen.

Turn the Power Switch to 'OFF'. While pressing of the [ENTER] button, turn the Power Switch to 'ON'.