

SERVICE MANUAL

INDUSTRIAL MONITOR

LMU-TK15C4 (GENERAL)

PRODUCT CODE No.			
LMU-TK15C4 1 938 102 49			



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Refer to the separate volume user's guide 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 40°C, or 41°F to 104 °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 from inside the unit. If this occurs, wait at least 15 minutes after turning the unit on before attempting to operate it.

1. MAIN SPECIFICATION

Display

Panel Type	TFT
Screen Size	15.0"
Pixel Pitch	0.297 x 0.297 mm
Pixel Format	1,024 x 768
Brightness	250cd/m ² typ.
Response Time	40ms
Contrast	350 : 1 typ.
Viewing Angle (minimum)	Left & Right :70 deg Up : 55 deg Down : 65 deg (CR=5)
Back Light	CCFL x 2
Colors	16.77 million

RGB Input

RGB Type		Analog RGB	
Signal Format	Signal	0.7Vp-p 75 ohm	
Synchronization Signal Format	Sync. Type/Level	Separate / TTL	
	Horizontal Freg.	24.8k – 60.2kHz	
	Vertical Freg.	56 – 75Hz	
Power Management		VESA DPMS	
Plug & Play		VESA DDC1, DDC2B	

VIDEO Input

Composite Video Signal Format	75 ohm 1Vp-p (PAL, NTSC)
S-Video Signal Format	Luminance : 75 ohm 1Vp-p
	Chrominance : 75 ohm 0.286Vp-p (PAL, NTSC)

Physical

	VGA	Mini D-Sub 15pin	
	VIDEO	RCA	
Input	S-VIDEO	Mini Din 4pin	
	Power Supply	DC IN Jack	
	OSD	4pin UB Connector	
	Operating	Operating : 5 deg to 40 deg	
Environment	Temperature	Storage : -20 deg to 60 deg	
	Humidity	30% - 85% RH (No Condensation)	
Power Supply (AC Adapter)	Model Name	GI40-US1225	
	Input	AC115-240V 1.0A-0.55A, 50-60Hz	
	Output	DC 12V 2.5A	
Power Supply Consumption		28W max.	
		5W in Energy Saving mode	
Dimensions		385(W) x 308(D) x 46(H) mm	
Weight		3.8kg	
Accessories		AC Adapter, Power Cord, VGA Cable, OSD Control Box, User's Guide	

2. TROUBLESHOOTING

Check the following for troubles of LCD monitor.

Symp	ton	Check Points	Treatments	Class		
No C	No Computer's Picture					
	1	Is the Power "ON" to a LCD Monitor and a Computer?	Check Power supply and Power switch for a LCD monitor and Computer.	А		
	2	Is a computer standing by ?	Be out of standing by condition, by operating to a computer	А		
3		Is a VGA cable connected securely ?	Ensure the connection of a VGA cable	А		
	4	Disconnected a VGA cable ? or Bent a terminal pin ?	Replace a VGA cable with the new one	В		
	5	Is an AC Adapter defective?	Replace an AC Adapter with the new one	С		
	6	Is the wire harness between main PCB and DC IN PCB secured firmly ?	Check the connection of wire harness	С		
	7	Is the wire harness between Inverter PCB and a LCD module secured firmly ?	Check the connection of wire harness	С		
	8	Is the wire harness between main PCB and Inverter PCB secured firmly ?	Check the connection of wire harness	С		
	9	Is the wire harness between main PCB and SW/LED PCB or main PCB and Brightness control volume connected securely ?	Check the connection of a wire harness	С		
	10	Is the Power Supply circuit on main PCB defective ?	Replace the main PCB with the new one	С		
	11	Is the Image Processing circuit on main PCB defective?	Replace the main PCB with the new one	С		
	12	Is the Brightness control volume defective ?	Replace the Volume PCB with new one, and check the screen	С		
	13	Is the LCD module defective ?	Replace a LCD module with the new one	С		
	14	Is the Inverter unit defective ?	Replace an Inverter unit with the new one	С		
	15	Is the display circuit on main PCB defective ?	Replace the main PCB with the new one	С		
White	e/Gi	rey on whole screen(Nothing on screen)				
	1	Is the wire harness between main PCB and LCD module secured firmly ?	Check the connection of wire harness	С		
	2	Is the LCD module defective ?	Replace a LCD module with the new one	С		
	3	Is the main PCB defective ?	Replace the main PCB with the new one	С		
Dark	scr	een				
	1	Is the wire harness between inverter and a LCD module secured firmly ?	Check the connection of a wire harness	С		
	2	Is the wire harness between one of inverters and main PCB secured firmly ?	Check the connection of a wire harness	С		
	3	Is the display circuit on main PCB defective ?	Replace the main PCB with the new one	С		
Scree	Screen's display range is incorrect					
	1	Is the adjustment for screen performed correctly?	Adjust the screen correctly	А		
	2	Is the computer's signal timing not agreeable to the LCD's specification?	Check the computer's signal timing	А		
	3	Is the output level on image from a computer not agreeable to LCD's specification ?	Check the specification of a computer	В		
	4 Is the size of screen set correctly? Set the size of screen again(refer to Us Manual for computer)		Set the size of screen again(refer to User's Manual for computer)	А		

A It is possible to treated by end-user

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

C It must be treated by Professional Technical Staff

Sympt	Sympton Check Points		Treatments	Class	
Scree	Screen is distorted				
	1	Is the adjustment for screen performed correctly?	Adjust the screen correctly	А	
	2	Is a VGA cable connected securely ?	Ensure the connection of a VGA cable	А	
	3 Is a sigal cable extended ? Don		Don't extend a VGA cable	А	
	4	Is the output level on image from a computer not agreeable to LCD's specification ?	Check the specification of a computer	В	
	5	Is the Image Processing circuit on main PCB defective ?	Replace the main PCB with the new one	С	
Part of	f c	olors(R/G/B) is not displayed. Black line appears in vertically			
	1	Is a VGA cable connected securely ?	Check the connection of a VGAI cable	А	
	2	Is the connection between main PCB and a LCD module securely?	Check the connection of a wire harness	С	
	3	Is the Image Processing circuit on main PCB defective ?	Replace the main PCB with the new one	С	

Additon

Sympto	n Check Points	Treatments					
No Vide	No Video Picture						
1 Is the Power "ON" to a LCD Monitor and a Video Equipment? Check Power a LCD monitor Check Power		Check Power supply and Power switch for a LCD monitor and Video Equipment	А				
	2 Does a Video signal output from Video Equipment ?	Ensure the Video signal	А				
	Is a video cable connected securely?	Ensure the connection of video cable	А				
4 Is an AC Adapter defective?		Replace an AC Adapter with the new one					
5 Is the connection between main PCB and a decoder PCB securely?		Check the connection of a wire harness	С				
	Is the video decode circuit on Decoder PCB defective ?	Replace theDecoder PCB with the new one	С				
	Is the Image Processing circuit on main PCB defective ?	n PCB defective ? Replace the main PCB with the new one					
Video ir	put selecting portion is not displayed on OSD menu.(VIDEO o	or S-VIDEO is not able to select.)					
	Is the connection between main PCB and a decoder PCB securely?	Check the connection of a wire harness	С				
	2 Is the video decode circuit on Decoder PCB defective ?	Replace theDecoder PCB with the new one	С				
	Is the Image Processing circuit on main PCB defective ?	Replace the main PCB with the new one	С				

A It is possible to treated by end-user

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3. MAINTENANCE

Disassembling the major components

- (1) Cabinet
 - 1.Unscrew to secure the cabinet (8-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 up, and pull two connectors out from inverter unit
 - 3.Disconnect two cables from the main PCB
- (3) Inverter Unit
 - 1. Unscrew to secure the Inverter Unit (4-position)
 - 2.Disconnect the cable from the Main PCB
- (4) Main PCB
 - 1.Pull a RGB signal cable out
 - 2.Unscrew to secure the Main PCB (5-position)
 - 3.Disconnect the cables on the Main PCB (7-position)
 - / Two connectors from LCD module
 - / One connector from the Switch PCB
 - / One connector from the VR PCB
 - / One connector from the DC-IN PCB
 - / One connector from the Inverter PCB
 - / One connector from the Video decoder
 - 4. Unscrew to secure the bracket for RGB connector (2-position)
- (5) Connector PCB
 - 1. Unscrew to secure the Connector PCB (2-position)
 - 2.Disconnect the cable from 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 two cables, one is from power switch and another one is From the Main PCB
- (8) Power PCB
 - 1.Remove the power switch, while pressing the hock of the power switch
- (9) Video decoder PCB
 - 1.Unscrew to secure the bottom lid(6-position)
 - 2. Unscrew to secure the bracket for the Video decoder PCB (4-position)
 - 3.Disconnect the cable from the Video decoder PCB



4. BLOCK DIAGRAM



6. TABLE OF SIGNAL NAME

Symbol	Symbol Signal Name Location		Notes
RED	RED/Analog Video Signal	P6-1	
GREEN	GREEN/Analog Video Signal	P6-2	
BLUE	BLUE/Analog Video Signal	P6-3	
DDDA(ID1)	DDC Data	P6-12	
HSYNC	Horizontal Synchronizing Signal	P6-13	
VSYNC	Vertical Synchronizing Signal	P6-14	
DDCK(ID3)	DDC Data Clock	P6-15	
BE7	BLUE Data[MSB]-Even	P10-2	POLARITY +
BE6	BLUE Data	P10-3	POLARITY +
BE5	BLUE Data	P10-4	POLARITY +
BE4	BLUE Data	P10-5	POLARITY +
BE3	BLUE Data	P10-7	POLARITY +
BE2	BLUE Data	P10-8	POLARITY +
BE1	BLUE Data	P10-9	POLARITY +
BE0(EVEN)	BLUE Data[LSB]-Even	P10-10	POLARITY +
GE7	GREEN Data[MSB]-Even	P10-12	POLARITY +
GE6	GREEN Data	P10-13	POLARITY +
GE5	GREEN Data	P10-14	POLARITY +
GE4	GREEN Data	P10-15	POLARITY +
GE3	GREEN Data	P10-17	POLARITY +
GE2	GREEN Data	P10-18	POLARITY +
GE1	GREEN Data	P10-19	POLARITY +
GE0(EVEN)	GREEN Data[LSB]-Even	P10-20	POLARITY +
RE7	RED Data[MSB]-Even	P10-22	POLARITY +
RE6	RED Data	P10-23	POLARITY +
RE5	RED Data	P10-24	POLARITY +
RE4	RED Data	P10-25	POLARITY +
RE3	RED Data	P10-27	POLARITY +
RE2	RED Data	P10-28	POLARITY +
RE1	RED Data	P10-29	POLARITY +
RE0(EVEN)	RED Data[LSB]-Even	P10-30	POLARITY +
DCLK	Data Clock	P9-2	
DENA	Data Enable	P9-4	POLARITY -
VD	Vertical Synchronizing Signal	P9-6	POLARITY +
HD	Horizontal Synchronizing Signal	P9-8	POLARITY +
BO7	BLUE Data[MSB]-Odd	P9-12	POLARITY +
BO6	BLUE Data	P9-13	POLARITY +
BO5	BLUE Data	P9-14	POLARITY +
BO4	BLUE Data	P9-15	POLARITY +
BO3	BLUE Data	P9-17	POLARITY +
BO2	BLUE Data	P9-18	POLARITY +
BO1	BLUE Data	P9-19	POLARITY +
BO0	BLUE Data[LSB]-Odd	P9-20	POLARITY +
G07	GREEN Data[MSB]-Odd	P9-22	POLARITY +

Symbol Signal Name		Location	Notes
GO6	GO6 GREEN Data		POLARITY +
GO5 GREEN Data		P9-24	POLARITY +
GO4	GREEN Data	P9-25	POLARITY +
GO3	GREEN Data	P9-27	POLARITY +
GO2	GREEN Data	P9-28	POLARITY +
GO1	GREEN Data	P9-29	POLARITY +
GO0	GREEN Data[LSB]-Odd	P9-30	POLARITY +
R07	RED Data[MSB]-Odd	P9-32	POLARITY +
RO6	RED Data	P9-33	POLARITY +
RO5	RED Data	P9-34	POLARITY +
RO4	RED Data	P9-35	POLARITY +
RO3	RED Data	P9-37	POLARITY +
RO2	RED Data	P9-38	POLARITY +
RO1	RED Data	P9-39	POLARITY +
RO0	RED Data[LSB]-Odd	P9-40	POLARITY +
TEST	Test Signal Out(*)	P9-43	
TEST	Test Signal Out(*)	P9-44	
TEST	Test Signal Out(*)	P9-45	
+12V	for Output Voltage (+)	P3-1	
VR1,2	for Cotrast Volume	P3-3,4	
ON=5V	for Back-Light Control	P3-5	H: Light ON
VR1,2	Brightness Control	P5-1,3	
VRC	Brightness Control	P5-2	
MENU	Menu Key Input	P2-1	
SEL	Select Key Input	P2-2	
DOWN	Down Key Input	P2-3	
UP	Up Key Input	P2-4	
LED R	LED/RED, Control Signal	P2-6	
LED G	LED/GREEN, Control Signal	P2-8	
VD0	Decoded Video Data	J1-3	
VD1	Decoded Video Data	J1-4	
VD2	Decoded Video Data	J1-5	
VD3	Decoded Video Data	J1-8	
VD4	Decoded Video Data	J1-9	
VD5	Decoded Video Data	J1-10	
VD6	Decoded Video Data	J1-12	
VD7	Decoded Video Data	J1-13	
VCLK	Decoder Clock	J1-15	
MC_DATA	I2C Data	J1-16	
MC_SCLK	I2C Clock	J1-17	
7114RESET#	Decoder Reset Signal	J1-18	L:Reset

* : This terminal must be opened at System-side.

7. EXPLODED VIEW AND MAIN PARTS LIST 7-1 Exploded View



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

REF No /	PART No.	DESCRIPTION	Q'ty	NOTES	
OUTER					
	661 004 4601	OUTER CARTON	1		
INDI	/IDUAL	-	-	-	
	632 861 5414	PAD, TOP	1		
	632 889 7827	ACCESSORY CASE	1		
	632 889 7834	PAD	1		
	661 000 9587	PAD CORNER	8		
	632 862 2696	POLYETHYLENE BAG, 400X550	1	FOR MONITOR	
	632 298 2376	POLYETHYLENE BAG, 120X320	1	FOR CNT BOX	
	632 567 2588	POLYETHYLENE BAG, 200X300	1	FOR RGB CABLE	
	632 603 0998	POLYETHYLENE BAG, 130X500	1	FOR AC COAD	
ACC	ESSORY				
	632 890 8363	INSTRUCTION MANUAL, ENGLISH	1		
	632 890 8370	INSTRUCTION MANUAL, GERMAN	1		
	661 007 5131	INSTRUCTION MANUAL, ENGLISH	1	FOR SUB PCB	
CAB	NET1				
1	661 007 7395	TOP LID ASS'Y	1		
16 🛆	661 004 4618	RATING PLATE	1		
CHA	SSIS				
12	661 011 1181	CHASSIS ASS'Y, BOTTOM	1		
11	661 007 7418	SHIELD PLATE ASS'Y, COMP	1		
CHA	SSIS ELC.				
3	661 001 5540	LIQUID CRYSTAL DIS. ASS'Y	1		
4 🖄	661 001 5588	DC-AC INVERTER ASS'Y	1		
15 🛆	661 001 5557	AC ADAPTER ASS'Y	1		
9	661 001 5595	SEESAW SWITCH ASS'Y	1		
2	661 001 5618	FFC ASS'Y	1		
13	661 001 3164	CONTROLL BOX ASS'Y	1		
14	632 835 1060	CABLE, VGA	1		
PC B	OARD		-		
5	661 011 1198	PW BOARD ASS'Y, MAIN	1		
7	661 001 5649	PW BOARD ASS'Y, VR	1		
8	661 001 5663	PW BOARD ASS'Y, DC-IN	1		
6	661 007 7432	PW BOARD ASS'Y, CN	1		
10	661 007 7449	PW BOARD ASS'Y, SUB	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'.