

# Universal LCD Driving System

## LDU-01B

### Drive Both Digital and Analog Panels!



LCD Test System Series  
LDU-01B

**L**DU-01B is a universal signal generator for p-Si TFT-LCD panels used for cellular phones and digital cameras, etc. which can input both digital video signals (8Bit) and analog video signals. (a-Si TFT-LCD passes via TAB IC)  
The resolution is up to QXGA (2048 X 1536) and meets requirements for 4096 horizontal dots (including blanking) and 4096 vertical lines (2V including blanking).  
Timing signals such as the clock signal and the start signal, and the video signal can be made with every single clock of the master clock (MCK), so any timing signal can be created and edited quickly and easily.  
The device has 8 channels of power supplies from V1 to V8, featuring high power output.  
A maximum of 64 test conditions can be made by the combination of 32 different voltage and signal level setting of timing signals and video signals.

### Major Features

- All signals to drive the LCD panel can be generated by LDU-01B.
- Thinking about the use in production, operation of the remote controller was so simplified.
- The DISPLAY1 screen shows V1, V2, V3, V4 currents, and VEXT1 to VEXT2 voltages.
- The DISPLAY2 screen shows V1 to V8 currents, and VEXT1 to VEXT4 voltages. Pass/Fail judgement will be also made on the screen.
- It is easy to calibrate the LCD power-supply voltage, timing signal, video signal and 4-level signals.
- Voltage differences between Vsig channels are minimized to less than +/-10mV.
- There are 16 channels of positive and negative drive signal memories.
- There are 24 channels of positive and negative digital signal memories.
- The reverse signal memory reverses Vsig01 to 24 per channel. Reversing polarity can be selected at each channel.
- The 4-level signal memory has 8 channels and 4-level output at different timing can be obtained. The channel 1 is only for Vcom and its center voltage can be adjusted.
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- Video signals, timing signals, and voltage setting data can be edited with a PC, and they can be written on the LDU-01B via LAN (EtherNet) or the floppy disk (FD).
- 64 different panel data can be memorized on the hard disk drive.

◆ GENERAL SPECIFICATION			
Ambience (Indoor)	Temperature	5°C to 40°C	
	Humidity	30% to 80% (Without dews)	
Line voltage		AC85 to 264V	
Line frequency		50Hz/60Hz	
Power consumption		200VA or less (at 100VAC input)	
Dimensions		430mm(W) x 405mm(D) x 299mm(H)	
Weight		20kg or less	
◆ LCD Power Supply (LCD PS board)			
V1/V2/V3/V4/V5/V6/V7/V8 Direct Current PS (Positive/Negative PS)			
Output range			
V1 to V6		Voltage : ±15V	Current : ±50mA
V7,V8		Voltage : ±20V	Current : ±50mA
Monitor Display			
V1 to V6		Voltage : ±15V	Current: ±50mA
V7,V8		Voltage : ±20V	Current: ±50mA
Precision : ±0.5% of full scale.			
External voltage monitor			
Number of input : 4CH		Input range : ±20V (Set in every 4 channels.)	Precision : ±0.5% of full scale.
ON/OFF CONTROL			
Number of output : 16CH		Voltage range : ±15V (Set in every 4 channels.)	Voltage accuracy Set voltage ±100mV
◆ CLK & Timing (Clock generation, timing memory, and amplification board)			
Frequency range			
6.25 MHz to 12.5MHz		31.25kHz step	
12.5 to MHz25MHz		62.5kHz step	
25 MHz to 50 MHz		0.125MHz step	
50 MHz to 100MHz		0.25MHz	
Oscillation frequency accuracy		Setting value ±0.005% or less	
Horizontal resolution		4096 dot / 1H	
Vertical resolution		4096 line / 1V	
Output connector			
Driving signal output		DHA_RC68_R132N (DDK) 68pin	
Check terminal X 4		MCK, Hsync, Vsync, and GND Terminal	
The cycle of switch		MCK, Hsync, and Vsync are adjusted to ½.	
Number of outputs and setting unit		16 Channels X2 (Positive / Negative) (DA01 to DA32) The amplitude setting is a unit of 4 channels.	
Electric characteristic Load condition: Line length 500mm, Load 100pF (At 100Ω terminal)			
Output impedance		100Ω ±1%	
Output range		±6V (±12V with the opening of terminal)	
Setting error		±0.1V or less against a set value	
De-phasing between channels		5nS or less (under the same load condition)	
Rise and Fall Time		20nS or less (At amplitude 5V p-p)	
Overshoot		10% or less	
Phase adjustment function		Range of adjustment ±40nS 1step 4nS±1nS (The Phase of the VIDEO signal is adjusted for the timing signal)	

<b>◆ D_ VIDEO (Memorizing digital video signal and amplifying board)</b>			
<b>Output signals</b>		<b>Video Signal</b>	24channel X2 (Positive /Negative) (8Bit X R,G, B) The amplitude adjustment synchronizes with all of 24 channes.
<b>Electric characteristic</b>		<b>Load condition: Line length 500mm, Load 100pF (At 100Ω terminal)</b>	
Output impedance		100Ω ±1%	
Output range		±6V (±12V with the opening of terminal)	
Setting error		±0.1V or less against a set value	
Rise and Fall Time		20nS or less (At amplitude 5V p-p)	
Overshoot		10% or less	
Minimum pulse width		20nS or more	
<b>◆ Vsig &amp; 4Level (Video signal and amplifying board of 4 value signal)</b>			
<b>Output signal</b>			
Vsig (For an analog video method) 24channels (R,G,B X8phases)		All channels synchronize with the amplitude setting of the contrast and the amplitude setting of the brightness. Reversing polarity can be selected with every one channel.	
Vref (For a digital video method)		Vsig01 to Vsig24 is outputted in the ratio set to Brightness (V0 black level) and Contrast (Vw white level) with PC. A central voltage becomes the same voltage as 4L1 Center.	
4 value signal (4Ln n =channel) 4channels		Timing and the output voltage of four value signals can be set with each channel. However, CH1 is only for the Vcom signal and can be changed with a remote box.	
<b>Electric characteristic</b>			
<b>(a) Vsig</b>		<b>Load condition: Line length 500mm, Load 100pF, Maximum amplitude 12Vp-p</b>	
Output impedance		20Ω	
Output range		Range of ±12V	
Setting error		The error between the phases is 0.01Vp-p or less	
Rise and Fall Time		50nS or less	
Overshoot		Vsig 1% or less	
<b>(b) 4 value signal</b>		<b>Load condition: Line length 500mm, Load 100pF, Maximum amplitude 12Vp-p</b>	
Output impedance		20Ω	
Output range		Range of ±12V	
Setting error		The error between the phases is 0.01Vp-p or less.	
Rise and Fall Time		50nS or less	
Overshoot		4 value signal 10% or less	
<b>◆ CPU JOINT BOARD (CPU relay board)</b>			
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<b>REMOTE OUTPUT</b>		Mini-Din 6Pin For PROMOTE BOX I2C signal	
<b>CPU BOARD</b>			
Central operation processor (CPU card)		PCA6751-266 (Made by ADVANTECH) CPU Intel Pentium MMX 266MHz	
Operating system		Windows 98	
Ethernet Interface		NetBEUI or TCP/IP	
Output connector	VGA	Monitor output	VGA port
	RJ-45	LAN connector	10BASE-T
	COM-01	Serial port	RS-232 for serial mouse
	PS2	AT keyboard	For keyboard