

D800DR & D640DR

User Guide

Introduction

This document provides the hardware related instructions to install a **D800DR or D640DR** interface card. It explains how to supply the card, connect the card to the VGA source signals and to the TFT LCDs, and to set up the parameters to the user's needs. The connectors, keyboard's display are fully described. Some example of connection to LCDs are also given.

The **D800DR** is suitable for driving SVGA resolution LCDs.

The **D640DR** is suitable for driving VGA resolution LCDs.

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Revision History

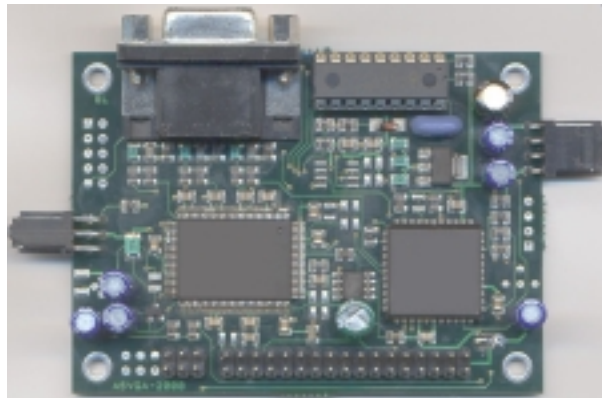
Rev No.:	Date	Description	Checked	Approved	Prepared	Issue Date
1	18-07-01	Initial Specification				
2.9	19-7-01	Updated to new PCB layout				

Description

This video card allows you to connect one LCD flat panel (TFT technology) with an analog video output from a computer.

This interface is also fully compatible with VGA (640x400) and SVGA (800x600) modes screens from: NEC, SANYO, SHARP, TOSHIBA and HOSIDEN...

Reduced dimensions (82 x 58 x 17 mm / 3.2 x 2.3 x 0.67 inches) and low power consumption make easier the integration of this card inside small equipment.



Technical specifications

Graphic resolutions : 640 x 480 pixels (VGA), 800 x 600 pixels (SVGA) and optionally XGA mode 1024 x 768 pixels

Text mode resolution : 720 x 400 pixels

24 bits color mode : 8 bits per color = 16 million colors

Fully compatible with SVGA standard (vertical refresh = 60 Hz and non-interlaced mode).

Video level adjustable by software for the three colors (RGB).

Configuration with a 3 push-buttons keyboard (Clock phase, screen width and centering image, video level).

On screen display for configuration menus (reduced OSD functions).

Permanent storage of the configuration parameters into an EEPROM.

Automatic recall of the default parameters by a simple RESET operation.

For volume orders, customer parameters may be preload as default settings prior to shipping.

Power supplies: 5 Volts and 12 Volts (only used for backlight)

Typ. power (5v): 400 mA (with no display connected).

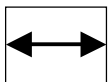
Optional feature: DDC function to communicate with "Plug and Play" video controller

Display adjustments

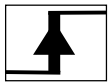
Function of the 3 push-buttons keyboard and OSD menus.

Left button	[-]	: decrease selected parameter	} Press both at power-on to RESET factory defaults
Right button	[+]	: increase selected parameter	
Center button	[M]	: selection between the 5 OSD menus (look at symbols after)	

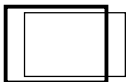
The RESET operation, sets the default parameters previously loaded by the manufacturer.



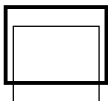
OSD menu N°1 = pixel clock (display width).



OSD menu N°2 = clock phase (display synchronization ; 16 steps).



OSD menu N°3 = horizontal centering image (left or right).



OSD menu N°4 = Vertical centering image (top or bottom).



OSD menu N°5 = video gain (RVB level).

Recommended method.

In order to adjust easily the image on the screen, you may use a video test chart with a square grid to center the display, and a palette with color scale to adjust correctly the video gain too.

Operation 1	RESET D800DR & D640DR card ; left and right buttons must be pushed simultaneously, at the power on.
Operation 2	Display OSD menu N°1 by pressing the center button, then adjust the width of the image like the width of the screen, using left or right buttons.
Operation 3	Display OSD menu N°2 by a second action on center button, then select the best clock phase which provides a stable display, using left or right buttons (16 steps available).
Operation 4	Display OSD menu N°3 by a third action on center button, then center the image horizontally, using left or right buttons.

Operation 5 Display OSD menu N°4 by a fourth action on center button, then center the image vertically, using left or right buttons.

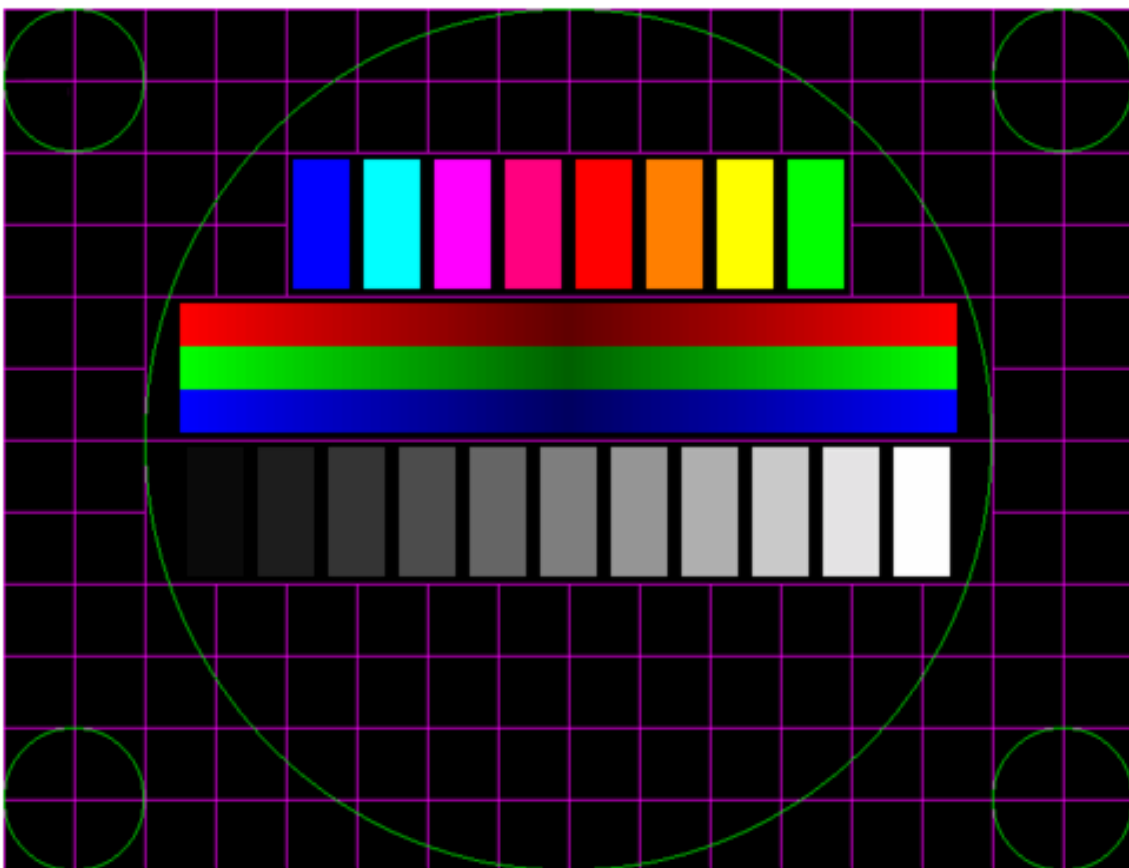
Note : If necessary, start again the adjustments by beginning at line "Operation 2", until an entire image perfectly centered is displayed.

Operation 6 Display OSD menu N°5 by a fifth action on center button, then adjust the video gain in order to divide up the increasing color scale on the maximum range.



These adjustments must be done both in graphic and text modes.

Example of a video test chart.



Connectors

J1 : configuration of display power supply (soldering bridge)

JP1 : standard analog video input (SUB D female header type – High Density 15 pins)

JP2 : not used (HE14 header type – 1x4 pins)

JP3 : general power supply (HE14 header type – 1x4 pins)

JP4 : optional analog video input (HE14 header type – 2x5 pins)

JP5 : 3 push–buttons keyboard (HE14 header type – 2x3 pins)

JP6 : color extension ; 12 bits "LSB" (header type HE10 – 2x6 pins)

JP7 : TFT display output (header type HE10 – 2x17 pins)

Configuration for display +5V / 3,3V (Strap J1 – 1x3 pins)

Display power supply	Pin 1	Pin 2	Pin 3
5 V	Soldering bridge		
3,3 V		Soldering bridge	

Standard video input connector (JP1 - VGA 15 pins and JP4 - 2x5 pins)

JP1 –	Symbol	Signals	JP4 –
1	Rin	RED video	1
2	Gin	GREEN video	3
3	Bin	BLUE video	5
4	NC	No connection	–
5	GND	Vertical sync ground	8
6	GND	RED ground	2
7	GND	GREEN ground	4
8	GND	BLUE ground	6
9	NC	No connection	–
10	GND	Horizontal sync ground	10
11	NC	No connection	–
12	DDA	DDC data	–
13	Hsync	Horizontal sync	9
14	Vsync	Vertical sync	7
15	DCK	DDC clock	–

Power supply connector (JP3 – 1x4 pins)

JP3 –	Symbol	Function
1	+5V	General Power supply +5V
2	GND	Signal Ground
3	GND	Signal Ground
4	+12V	General Power supply +12V

3 buttons-keyboard connector (JP5 – 2x3 pins)

JP5 –	Symbol	Function
1	+OSD	Increase value
2	+12V	Power supply +12V
3	–OSD	Decrease value
4	+5V	Power supply +5V
5	MOSD	OSD menu selection
6	GND	Signal Ground

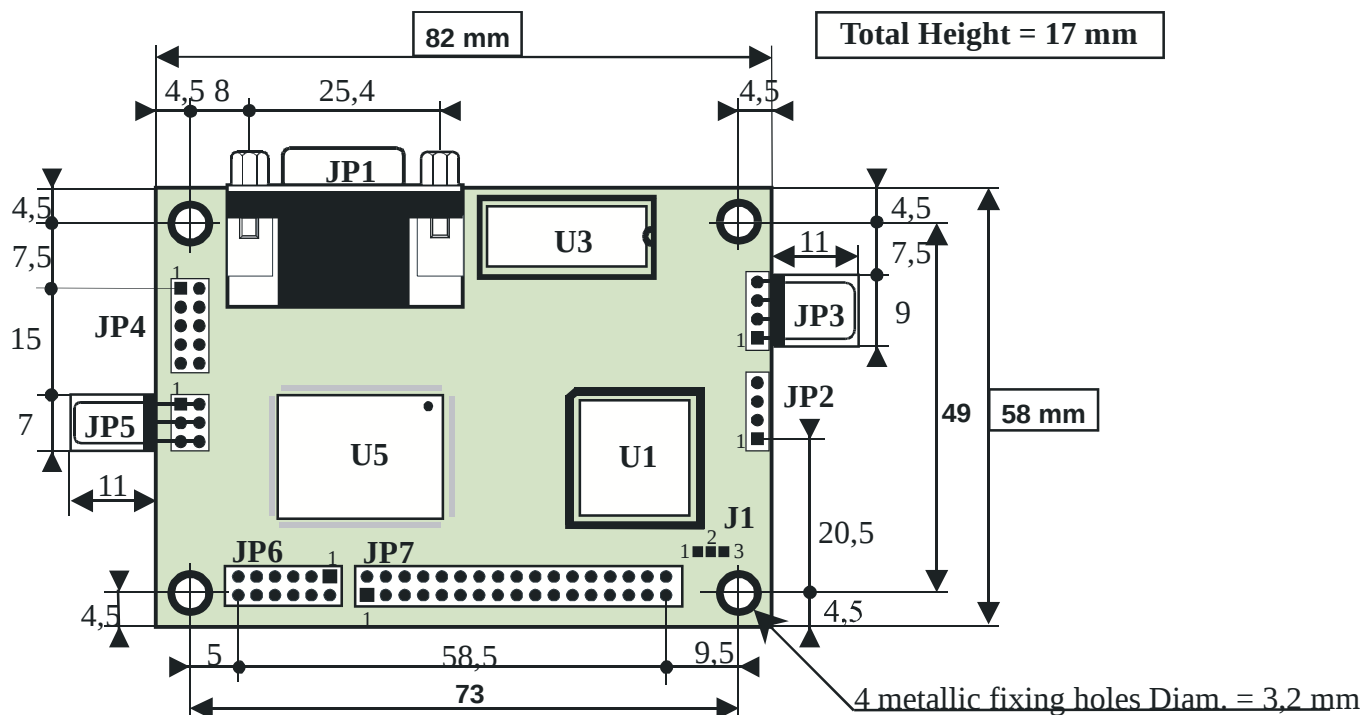
JTAG connector (JP2 – 1x4 pins)

This connector is not used.

Different models of connector used on TFT displays

Connectors	Display module side connectors	Mating connectors
Header 31 pins	JAE : IL310 – T31PB – VF HIROSE : DF9 – 31P – 1V	JAE : IL310 – T31S – VF HIROSE : DF9 – 31S – 1V or – 1R
Header 41 pins	JAE : IL310 – T41P – VF HIROSE : DF9 – 41P – 1V	JAE : IL – 310 – T41S – VF HIROSE : DF9M – 41S – 1V
Header 34 pins	Composed by 3 JAE connectors : CN1 (10pins) = IL – Z – 10PL – SMTY CN2 (13pins) = IL – Z – 13PL – SMTY CN3 (11pins) = IL – Z – 11PL – SMTY	Composed by 3 JAE connectors : To plug into CN1 : IL – Z – 10S – S125C3 To plug into CN2 : IL – Z – 13S – S125C3 To plug into CN3 : IL – Z – 11S – S125C3

Mechanical dimensions of the D800DR & D640DR card



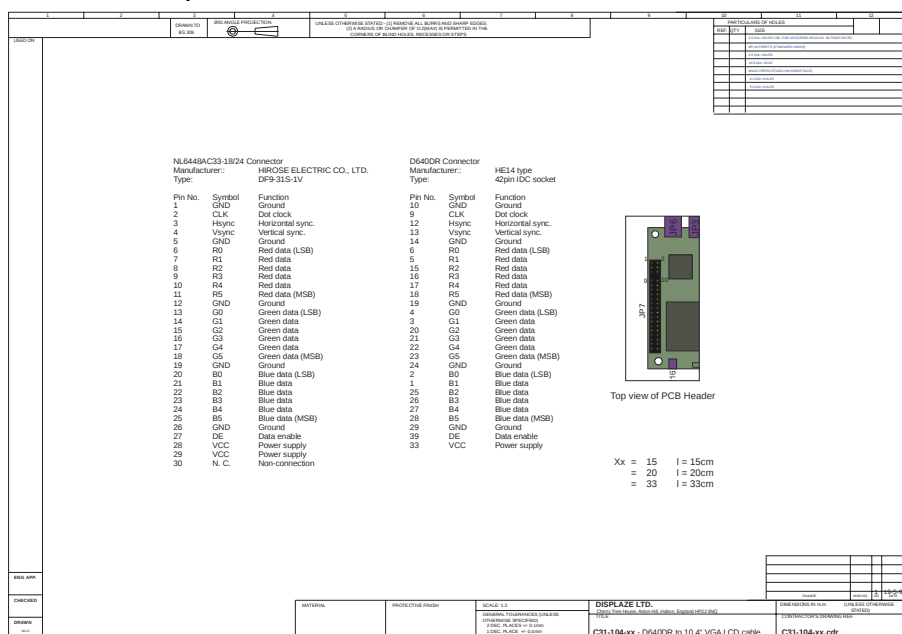
Connection between the D800DR & D640DRcard and some NEC TFT displays

D800DR & D640DR connectors		Symbol	Function	NL6448AC30-10 NL6448AC33-10 NL8060AC26-02	NL6448AC20-06 NL6448AC33-17 NL6448AC33-18 NL6448AC33-24 NL6448AC33-27 NL6448AC33-29 NL6448BC20-08 NL6448BC33-31 NL6448CC33-30	NL6448BC63-01	NL6448AC33-13 NL8060AC26-04 NL8060AC26-11 NL8060AC31-01 NL8060AC31-12 NL8060BC31-02 NL8060BC31-17
JP7	JP6			Header 34 pins	Header 31 pins	Header 40 pins	Header 41 pins
1		TFTCLK	Pixel Clock	1	2	2	2
2		GND	Signal Ground	2	1	1	1
3		GND	Signal Ground	3	1	1	3
4		Hsync	Horizontal synchro	4	3	3	4
5		Vsync	Vertical synchro	5	4	4	5
6		GND	Signal Ground	6	5	5	6 + 7 + 8 + 12
7		R4	RED signal bit 4	7	8	10	11
8		R5	RED signal bit 5	8	9	11	13
9		R6	RED signal bit 6	9	10	12	14
10		R7	RED signal bit 7 (MSB)	10	11	13	15
11		GND	Signal Ground	11	12	14	16 + 17 + 18 + 22
12		G4	GREEN signal bit 4	12	15	19	21
13		G5	GREEN signal bit 5	13	16	20	23
14		G6	GREEN signal bit 6	14	17	21	24
15		G7	GREEN signal bit 7 (MSB)	15	18	22	25
16		GND	Signal Ground	16	19	23	26 + 27 + 28 + 32
17		B4	Signal BLEU bit 4	17	22	28	31
18		B5	Signal BLEU bit 5	18	23	29	33
19		B6	Signal BLEU bit 6	19	24	30	34
20		B7	Signal BLEU bit 7 (MSB)	20	25	31	35
21		GND	Signal Ground	21	26	32	36 + 38
22		GND	Signal Ground	22			
23		Display On/Off	Backlight control	23			
24		GND	Signal Ground	24	26		
25		+Vcc	Display supply +5V/3,3V	25	28	34	39
26		+Vbl	Backlight supply +12V	26	–		
27		+Vbl	Backlight supply +12V	27	–		
28		NC	No connection	28	–		
29		GNDB	Backlight Ground	29	26		
30		GNDB	Backlight Ground	30	26	36	
31		DE	DATA ENABLE (DE)	31	27	33	37
32		+Vcc	Display supply +5V/3,3V	32	29	35	40

33		Display On/Off	Backlight control	33			
34		GND	Signal Ground	34	26		
—	—	MVA	Best viewing select	—	—	36	—
—	—	R/L	Scan direction (horizontal)	—	—	37	—
—	—	U/D	Scan direction (vertical)	—	—	38	—
	1	R2	RED signal bit 2 (LSB for 18 bits color mode)	—	6	8	9
	2	R3	RED signal bit 3	—	7	9	10
	3	G2	GREEN signal bit 2 (LSB for 18 bits color mode)	—	13	17	19
	4	G3	GREEN signal bit 3	—	14	18	20
	5	B2	BLUE signal bit 2 (LSB for 18 bits color mode)	—	20	26	29
	6	B3	BLUE signal bit 3	—	21	27	30
	7	R0	RED signal bit 0 (LSB for 24 bits color mode)			6	
	8	R1	RED signal bit 1			7	
	9	G0	GREEN signal bit 0 (LSB for 24 bits color mode)			15	
	10	G1	GREEN signal bit 1			16	
	11	B0	BLUE signal bit 0 (LSB for 24 bits color mode)			24	
	12	B1	BLUE signal bit 1			25	

Standard Connections

Example of NEC 10" 4 part.: NL6448AC33-18 & NL6448AC20-06 with 33-18-10-31 cable, 20-06-10-31 cable, AS100-15 or C31-104xxC cable.



Example of NEC 12.1" part.: NL8060AC31-12 cable for the D800DR rev1

DRAWN TO		PROTECTIVE PROVISION		UNLESS OTHERWISE STATED, (1) INVENTOR ALL RIGHTS AND INTERESTS ARE RESERVED AND (2) INVENTOR'S RIGHTS ARE RESERVED IN THE FORMS OF PATENTS OR RECORDS IN THE		DRAWING OF THE CABLE	
REV 001		REV 001		REV 001		REV 001	
NL8060AC31-12G, NL8060AC31-17 Connector		D800DRv1 Connector		HE14 type		42pin IDC socket	
Manufacturer: HIROSE ELECTRIC CO., LTD.		Manufacturer: HIROSE ELECTRIC CO., LTD.		Type: D800DRv1		Type: D800DRv1	
Type: DP9-41S-1V		Type: DP9-41S-1V		Type: DP9-41S-1V		Type: DP9-41S-1V	
Pin No.	Symbol	Function	Pin No.	Symbol	Function	Pin No.	Symbol
1	GND	Ground	10	GND	Ground	1	GND
2	CLK	Dot clock	9	CLK	Dot clock	2	CLK
3	GND	Ground	11	GND	Ground	3	GND
4	Hsync	Horizontal sync.	12	Hsync	Horizontal sync.	4	Hsync
5	Vsync	Vertical sync.	13	Vsync	Vertical sync.	5	Vsync
6	GND	Ground	14	GND	Ground	6	GND
7	GND	Ground	14	GND	Ground	7	GND
8	GND	Ground	14	GND	Ground	8	GND
9	R0	Red data (LSB)	5	R0	Red data (LSB)	9	R0
10	R1	Red data	5	R1	Red data	10	R1
11	R2	Red data	15	R2	Red data	11	R2
12	GND	Ground	14	GND	Ground	12	GND
13	R3	Red data	16	R3	Red data	13	R3
14	R4	Red data	17	R4	Red data	14	R4
15	R5	Red data (MSB)	18	R5	Red data (MSB)	15	R5
16	GND	Ground	19	GND	Ground	16	GND
17	GND	Ground	19	GND	Ground	17	GND
18	GND	Ground	19	GND	Ground	18	GND
19	G0	Green data (LSB)	4	G0	Green data (LSB)	19	G0
20	G1	Green data	3	G1	Green data	20	G1
21	G2	Green data	20	G2	Green data	21	G2
22	GND	Ground	24	GND	Ground	22	GND
23	G3	Green data	21	G3	Green data	23	G3
24	G4	Green data	22	G4	Green data	24	G4
25	G5	Green data (MSB)	23	G5	Green data (MSB)	25	G5
26	GND	Ground	24	GND	Ground	26	GND
27	GND	Ground	24	GND	Ground	27	GND
28	GND	Ground	29	GND	Ground	28	GND
29	B0	Blue data (LSB)	2	B0	Blue data (LSB)	29	B0
30	B1	Blue data	1	B1	Blue data	30	B1
31	B2	Blue data	2	B2	Blue data	31	B2
32	GND	Ground	30	GND	Ground	32	GND
33	B3	Blue data	16	B3	Blue data	33	B3
34	B4	Blue data	27	B4	Blue data	34	B4
35	B5	Blue data (MSB)	28	B5	Blue data (MSB)	35	B5
36	GND	Ground	38	GND	Ground	36	GND
37	DE	Data enable	39	DE	Data enable	37	DE
38	MVA	Viewing Angle Select	39	MVA	Viewing Angle Select	38	MVA
39	VCC	(V/I 3.3) Power supply	33	VCC	Power supply	39	VCC
40	VCC	(V/I 3.3) Power supply	40	VCC	Power supply	40	VCC
41	DSP	Scan Direction	42	GND	L = Normal, H = Reverse	41	DSP
			35	+12V	Backlight +ve		
			37	GND	Backlight -ve		
REV 001		REV 001		REV 001		REV 001	
DISPLAZE LTD.		DISPLAZE LTD.		DISPLAZE LTD.		DISPLAZE LTD.	
C41-121-xxC - D800DR to 12.1" SVGA LCD cable		C41-121-xxC - D800DR to 12.1" SVGA LCD cable		C41-121-xxC - D800DR to 12.1" SVGA LCD cable		C41-121-xxC - D800DR to 12.1" SVGA LCD cable	
C41-121-xxC.cdr		C41-121-xxC.cdr		C41-121-xxC.cdr		C41-121-xxC.cdr	

Example of NEC 12.1" part.: NL8060AC26-11 cable for the D800DR rev1

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REV 001		REV 001		REV 001		REV 001	
NL8060AC26-11/17 Connector		D800DRv1 Connector		HE14 type		42pin IDC socket	
Manufacturer: HIROSE ELECTRIC CO., LTD.		Manufacturer: HIROSE ELECTRIC CO., LTD.		Type: D800DRv1		Type: D800DRv1	
Type: DP9-41S-1V		Type: DP9-41S-1V		Type: DP9-41S-1V		Type: DP9-41S-1V	
Pin No.	Symbol	Function	Pin No.	Symbol	Function	Pin No.	Symbol
1	GND	Ground	10	GND	Ground	1	GND
2	CLK	Dot clock	9	CLK	Dot clock	2	CLK
3	GND	Ground	11	GND	Ground	3	GND
4	Hsync	Horizontal sync.	12	Hsync	Horizontal sync.	4	Hsync
5	Vsync	Vertical sync.	13	Vsync	Vertical sync.	5	Vsync
6	GND	Ground	14	GND	Ground	6	GND
7	GND	Ground	14	GND	Ground	7	GND
8	GND	Ground	14	GND	Ground	8	GND
9	R0	Red data (LSB)	5	R0	Red data (LSB)	9	R0
10	R1	Red data	5	R1	Red data	10	R1
11	R2	Red data	15	R2	Red data	11	R2
12	GND	Ground	14	GND	Ground	12	GND
13	R3	Red data	16	R3	Red data	13	R3
14	R4	Red data	17	R4	Red data	14	R4
15	R5	Red data (MSB)	18	R5	Red data (MSB)	15	R5
16	GND	Ground	19	GND	Ground	16	GND
17	GND	Ground	19	GND	Ground	17	GND
18	GND	Ground	19	GND	Ground	18	GND
19	G0	Green data (LSB)	4	G0	Green data (LSB)	19	G0
20	G1	Green data	3	G1	Green data	20	G1
21	G2	Green data	20	G2	Green data	21	G2
22	GND	Ground	24	GND	Ground	22	GND
23	G3	Green data	21	G3	Green data	23	G3
24	G4	Green data	22	G4	Green data	24	G4
25	G5	Green data (MSB)	23	G5	Green data (MSB)	25	G5
26	GND	Ground	24	GND	Ground	26	GND
27	GND	Ground	24	GND	Ground	27	GND
28	GND	Ground	29	GND	Ground	28	GND
29	B0	Blue data (LSB)	2	B0	Blue data (LSB)	29	B0
30	B1	Blue data	1	B1	Blue data	30	B1
31	B2	Blue data	2	B2	Blue data	31	B2
32	GND	Ground	30	GND	Ground	32	GND
33	B3	Blue data	16	B3	Blue data	33	B3
34	B4	Blue data	27	B4	Blue data	34	B4
35	B5	Blue data (MSB)	28	B5	Blue data (MSB)	35	B5
36	GND	Ground	38	GND	Ground	36	GND
37	DE	Data enable	39	DE	Data enable	37	DE
38	VCC/DPS	(V/I 3.3) Power supply, Scan Direction Select	33	VCC	Power supply, DPS/26-17 L= Rev, H=Normal	38	VCC/DPS
39	VCC	(V/I 3.3) Power supply	33	VCC	Power supply	39	VCC
40	VCC	(V/I 3.3) Power supply	40	VCC	Power supply	40	VCC
41	MODE	Timing Mode Select	42	GND	L = DE Mode, H = Fixed	41	MODE
			35	+12V	Backlight +ve		
			37	GND	Backlight -ve		
REV 001		REV 001		REV 001		REV 001	
DISPLAZE LTD.		DISPLAZE LTD.		DISPLAZE LTD.		DISPLAZE LTD.	
C41-104-xx - D800DR to 10.4" SVGA LCD cable		C41-104-xx - D800DR to 10.4" SVGA LCD cable		C41-104-xx - D800DR to 10.4" SVGA LCD cable		C41-104-xx - D800DR to 10.4" SVGA LCD cable	
C41-104-xx.cdr		C41-104-xx.cdr		C41-104-xx.cdr		C41-104-xx.cdr	

Parts List**D800DR & D640DR**

Part	Notes
D800DR	SVGA LCD Interface PCB
D640DR	VGA LCD Interface PCB
D800DR-OSD	OSD Keyboard included with evaluation units only. ¹
D800DR-PSL	Internal Power Lead

Notes: 1 1off D800DR-OSD is supplied for every 5off D800DR.

Optional Extras

Part	Notes
D800DR-OSD	OSD Keyboard included with evaluation units only. ¹
D800DR-PSL	Internal Power Lead
AX0041	LCD Interface cable for NL6448AC33-10
C31-104-20	LCD Interface cable for NL6448AC33-18, 20-06
C41-104-20	LCD Interface cable for NL8060BC26-17
C41-121-20	LCD Interface cable for NL8060BC31-17
VGA-PSL	Combined VGA and Power lead for Chassis.

Warranty

12 months from date of shipment

Shipping

Shipping by TNT, Federal Express or Airborne Express may be arranged upon request

Packaging

Standard Export Carton