

D1280AR

User Guide

Features

The **D1280AR** interface card enables the replacement of standard CRT displays with NEC high-resolution-analog Full color TFT displays (NL128102AC20-07 and NL128102AC31-01) driven from the standard RGB video signals of PCs and workstations.

The D1280AR checks the connected video signal timings, and performs the necessary corrections for the TFT automatically. The generated parameters are used for detection of the current video mode. Following timing characteristics are used:

HSync-polarity VSync-polarity HSync-frequency VSync-frequency Line count

Determining these parameters enable detection of the video mode. Once calculated they will be saved together with this mode detection data in one of more than 64 available memory locations.

All parameters are continuously scanned and evaluated in real time. If these parameters change, D1280AR waits until the new video timing is constant, and then looks for comparable settings stored in the memory. If there is no corresponding entry found, the saved settings will be restored.

This manual provides the hardware related instructions to install an D1280AR 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.

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Disclaimer

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Revision History

Rev No.:	Date	Description	Checked	Approved	Prepared	Issue Date
1.4	10-5-98	Added cable details				
1.8	14-3-99	Udpate to SW13 settings				
2.11	24-5-00	Added MTBF and cable specifications				
2.12	13-6-02	Amended phone details				
		Added 15.2" SXGA cable data				
2.13	10-8-02	Added Video Add-on Info				

Introduction

The **D1280AR** board is used to drive directly NEC high-resolution analog full color displays with standard video-signals of PCs and workstations.

A special graphic board is not required. The **D1280AR** board is connected to the PC by a standard VGAmonitor cable.

The video signal gets analysed full automatically by the electronic (separate H/V-Sync, composite Sync on HS-Pin or VS-Pin, Sync On Green), therefore it runs on PCs as well as on workstations.

Video modes with a lower than a TFT-resolution get expanded and occupy the whole display area (as MultiSyncTM-CRTs).

As the video signals of PCs and workstations do not have any fixed timing, size and position of the image may be adjusted in all directions. All needed adjustments can be done with an easy to handle OSD (On-Screen-Display), and have to be done only one time, the chosen parameters will be saved.

The interface needs a supply voltage of 12V DC. All other voltages, which are necessary for driving the **D1280AR** will be generated on board.

	Min	Тур	Max	
supply voltage	11,4	12,0	12,6	V
supply current incl. TFT	0,2	1,5 D	2,5 ②	А
supply current excl TFT		320	400	mA
MTBF		1319829		Hrs
PLL-phase-jitter		500		ps
PLL-frequency-range	20		>200	MHz
vertical-frequency	40		150 3 4	Hz
VSYNC-accuracy		0,003		Hz
horizontal-frequency	15 ④		80 3	KHz
HSYNC-accuracy	4			Hz
mode detection memory		64		Loc
resolution	640 x 400	5	1600 x 1280	pixels

The default parameters may be seen below:

1 with NL10276AC24-05, 12,1"

2 with NL128102AC28-01, 20" without backlight

3 with NL128102AC20-07, 13" only in modes less than absolute display resolution

4 (5)

depending on display



The following picture shows the installation of the **D1280AR**:



Locating jumpers and connectors

POWER	-	supply voltage input (pay attention to polarity !!!)
SW13	-	configuration switch (wrong setting may damage the display)
CONTROL	-	RS232 and external keyboard for image adjustment
VGA	-	VGA entry
CN4	-	connection to CON4 of TFT
CN3	-	connection to CON3 of TFT
CN2	-	connection to CON2 of TFT

Pin Assignment

Position of mounting holes

name	X (mm)	Y (mm)	
B1	-92,234	52,737	all mounting holes have
B2	-54,928	52,737	a diameter of 3,2 mm
B3	-54,769	-20,765	
B4	-89,694	-54,419	
В5	-73,819	-96,329	
B6	-3,969	-96,329	
B7	-28,099	-129,349	
B8	-5,700	-25,800	

supply voltage

Pin	Signal
1	+12V
2	+12V
3	+12V - CCFL
4	+12V - CCFL
5	GND
6	GND
7	GND
8	GND

HRS DF13-8S-1.25C

Doc. Name: D1280ARUG.doc Author: Mark I. Cartlidge connection to TFT

Pin	Signal
1	blue
2	green
3	red
4	VSYNC
5	HSYNC
6	CLK
HRS	MRF03-6PR-SMT

CN2-TFT		
Pin	Signal	
1	VDD	
2	VDD	
3	GND	
4	GND	
5	POWC	
6	GND	
7	3V3	
8	3V3	
9	GND-DESEL	
10	GND	
11	GND	
12	GND-DE	
HRS	DF13-12S-1.25C	

CN3-CCFL

Pin	Signal
1	BRTL
2	GND-BRTH
3	BRTC
4	ACA
5	GND
6	GND
7	GND
8	VDD-CCFL
9	VDD-CCFL
10	VDD-CCFL

HRS DF13-10S-1.25C

Attention

Do NOT connect

To 20" display

CN4-T	ΈT
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Pin	Signal
1	GND
2	GND
3	CNTDAT
4	CNTSTB
5	GND
6	CNTCLK
7	CPSEL
8	CLAMP
9	GND
10	FIELD
11	GND
12	NC
13	GND
14	NC

HRS DF13-14S-1.25C

connection to TFT (only for NL6448AC33-15)

CN-15-TFT

Pin	Signal
1	GND
2	VSYNC
3	GND
4	HSYNC
5	GND
6	blue
7	GND
8	green
9	GND
10	red
UDC	DE12 100 1 250

Pin	Signal
1	VCC
2	VCC
3	NC
4	GND

CN2X

6 CLK HRS DF13-6S-1.25C

GND

5

HRS DF13-10S-1.25C

connection to PC

<u>Video-IN</u>

Pin	Signal	Pin	Signal
1	red	2	GND-red
3	green	4	GND-green
5	blue	6	GND-blue
7	VSync	8	GND
9	HSync	10	FIELD

pin-header

Video-IN

Pin	Signal	Pin	Signal
2	GND	1	RED
4	GND	3	GREEN
6	GND	5	BLUE
8	GND	7	VSYNC
10	FIELD	9	HSYNC
12	-5V	11	VCC
14	I2C_DAT	13	12V
16	RxD	15	I2C_CLK
18	V0	17	TxD
20	V2	19	V1
22	Y0	21	V3
24	Y2	23	Y1
		25	Y3

Cables Supplied

The D1280AR is supplied with the following cables:-

- VGA This cable connects the D1280AR via this cable to a VGA style high denisty 15-pin D-Type, 30cm.
- Control Ribbon cable for control connector, and may be used for OSD configuration when fitted with suitable switches, 60cm.

Power Ribbon cable for connecting power to the D1280AR, 60cm

- CN2 Ribbon cable, 11cm
- CN3 Ribbon cable, 18cm
- CN4 Ribbon cable, 13cm

Adjusting the image position

The test pictures should be used for optimum adjustment of the image position. Choose a test picture with the desired resolution and display it using a suitable viewer.

Start with the vertical adjustment. The expand factor should be set automatically from the standard parameters when a new video mode has been detected. But the vertical expansion factor can be manually selected in predefined steps (1 / 1,25 / 1,6 / 2,0 / 2,5).

For adjustment of the horizontal image position move the image exactly to the left edge of the display area. Now adjust the image size until it fits exactly to the right edge of the display area. Doing this will have moved the left image position, so this has to be readjusted. This procedure should be repeated until the image exactly fits both edges of the display area. The red edges of the image must be visible. By moving the image one pixel to the left and one pixel to the right, the correct image size can be obtained when the vertical red lines at the image edges disappear.





The diagram illustrates typical RGB-wave forms and the sampling. High quality graphic boards have RGBsignals with a pulse shape between both the extremes shown above. Some graphic board designs using slow low cost DACs do not achieve the full output voltage level (left diagram) when displaying one single point (for example a vertical line). The full output level is only reached if the same color value is displayed during more than one consecutive pixel (right diagram).

The phase adjustment moves the sampling position of the RGB signal. This is the last adjustment that has to be done, image size and position should have been adjusted first.

The phase adjustment should be moved in the positive direction until a sharp and stable image is obtained. By default the phase is adjusted near the negative extreme value. The image position may be is affected by this with a offset of one pixel. In this case, the image should be moved in the horizontal direction until it fits.

Save

All these adjustments together with the mode detection data are resident stored, mode by mode. The **D1280AR** has more than 64 entries in the video mode memory. If a video mode is stored more than ones, the older adjustment values will be overwritten. Adjustments that have not been stored will be lost when switching to another video mode.

Monitor Cable

To achieve high image quality, a monitor cable with shielded coax lines for RGB and SYNC signals must be used. Using cheap unshielded cable will result in loss of image quality.

Hardware Configuration

Selection of the display

You have to select the correct display type by the miniature switch SW13.

The selection of the wrong display type may damage your TFT.

Please pay attention to that. Others, than the following combinations are not allowed.

1	2	3	4	Display type	Size	Res.
ON	OFF	OFF	ON	NL10276AC23-02	15.4"	SXGA
OFF	OFF	OFF	ON	NL10276AC30-03	15.0"	XGA
ON	ON	ON	OFF	NL128102AC28-01	18.1"	SXGA
OFF	ON	ON	OFF	NL10276AC24-05	12.1"	XGA
ON	OFF	ON	OFF	NL10276AC28-02	14.1"	XGA
OFF	OFF	ON	OFF	NL10276AC28-01	14.1"	XGA
ON	ON	OFF	OFF	NL6448AC33-15	10.4"	VGA
OFF	ON	OFF	OFF	NL128102AC20-07	13.0"	SXGA
ON	OFF	OFF	OFF	NL10276AC24-02	12.1"	XGA
OFF	OFF	OFF	OFF	NL128102AC31-01	20.1"	SXGA

SW13 - CONFIG

8	Firmware update
OFF	Firmwareupdate OTP
ON	normal operation

Image Position

The display control of **D1280AR** can be done by an external keyboard and/or the OSM serial port.

CONTROL

Pin	Signal	
1	T1	Menu
2	T2	+/down
3	Т3	- / up
4	T4	Enter
5	T5	On/off - Display
6	Тб	
7	Τ7	
8	Т8	
9	Т9	
10	T10	
11	T11	
12	T12	
13	TxD	Pin 2 - Dsub 9 female
14	RxD	Pin 3 - Dsub 9 female
15	GND	Pin 5 - Dsub 9 female
HRS	DF13-15S-1.25C	-



Keyboard

All settings can be done comfortably by the four external key and the OSD menu.

The external keyboard needs to have following layout:



On Screen Display (OSD) Operation



For the ideal picture setting use a suitable test image of the desired resolution. Then, adjust your display using the on screen menus.

MAIN MENU



Call and close the main menu by pressing the [Menu] key.

Open the menus by highlighting with the [+] (up) and [-] (down) keys and pressing [Enter].

SETUP MENU

SETUP	
	382
	1687
	39
	100
$\overline{\mathbf{v}}$	54
	SAVE
	PRESET
HORIZONTAL POSITION	

The setup menu is used to expand and position the picture on the monitor's display area.

Menu options are selected with the [+] and [-] keys. Press [Enter] to open the highlighted option, pressing [Enter] again closes the menu.



HORIZONTAL POSITION

Altering the pictures position is done by changing the settings (pressing keys [UP] and [DOWN]). If the display and graphic map resolution is the same, then to achieve optimum picture setting the whole of the picture should fill the monitor's display area. This can be seen from the one pixel wide red line in the corners of the test picture. These lines are clearly visible when the picture is correctly aligned.

HORIZONTAL SIZE

The picture can be expanded horizontally to the right. The position to the left-hand edge of the picture does not change. With a 1:1 resolution, (i.e. graphic and display map are the same) ensure that the red 1 pixel lines in the corners of the test picture remain visible and the test picture fills the whole of the display area on the right-hand edge of the screen.



VERTICAL POSITION

The position of the display can be moved up or down on the screen. Here again with 1:1 resolution, ensure that the red one-pixel lines in the corner of the test picture are visible and that the test picture fills the full display area of the monitor.



VERTICAL SIZE

The picture can be distorted vertically by percentage values. The displayed value indicates the percentage of distortion. The correct expansion is usually automatic, but can be manually corrected here.

CLOCK PHASE

Set the scanning time (focus) here [UP] and [DOWN] keys.

SAVE

You can save the entered values by pressing the [DOWN] key. So as not ot lose the data at the next mode change, when a video mode is saved several times, the previous save is always overwritten so it does not take up memory. After each save the selected menu option is deactivated automatically after a 0,5 sec delay. Any other key will abort action without saving the data.



The default setting of the test picture can be restored using the [UP] key.

PICTURE MENU





BRIGHTNESS

Brightness is adjusted according to personal preference by using the [DOWN] (less) and [UP] (more) key. A value of 48 indicates the default setting. Settings below 48 will dim the backlight. A DC offset in the RGB-level generates an increase in brightness. The black level of the pictures is increased at the same time.

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CONTRAST

Contrast is adjusted with the UP and DOWN keys (see above) and should again be set to suit the users personals preference.

COLOUR TEMPERATURE

This is selected with the [Enter] key. The ideal setting will depend on personal preference. The user has a choice of three preset colour temperature combinations (A,B or C), or can generate his own user defined combination. the saturation level of the colours can be adjusted by selecting the colours R (red), G (green) and B (blue) with [Enter] and the pressing [UP] (for more saturation) and [DOWN] (for less saturation).

SAVE

Selecting this menu option with the [DOWN] key (see Setup Menu) can save the settings.

VIDEO/SOURCE MENU



These two menus appear only in connection with the D1280ARV, a multi-standard video decoder and signal source multiplexer for the D1280AR with the following features:-

- Digital Noise Reduction
- Black Level Expansion
- Dynamic Peak
- □ Input Bandwidth to 40MHZ
- □ Five Input Source options

OPTIONS MENU

OPTIONS	
PROMPT:	
⊙ on	⊖off
LANGUAGE: • German • French	⊖ English
OSD:	180 sec.
HOT-KEY: Contrast	
sets PROM	PT Mode

PROMPT:

When Prompt selected, the info mode automatically appears for a short while whenever the video mode is changed.

LANGUAGE:

Here you can select between English, French and German.

RS232 Address:

This option is used to identify the unit when operating an the serial interface (see definition of RS232 command set).

INFO MENU

Мо	de Info
Mode	1280x1024
HFreq	<u>79.91 KHz</u>
VFreq	75.11 Hz
HPol	neg.
VPol	neg.
Sync	RGB H-V
Lines	1064
HPosition	382
VPosition	<u>39</u>
Entry	27

Information panel displaying the parameters of the current video mode.

Mode:	The resolution is given on the basis of the number of lines
HFreq:	H-Sync-frequency to within 4Hz
VFreq:	V-Sync-frequency to within 0,003 Hz
HPol:	H-Sync-polarity, neg. = negative sync pulse
VPol:	V-Sync-polarity, neg. = negative sync pulse
Sync:	Type of synchronous signals (RGB H-V, composite, on GREEN)
Zeilen:	absolute number of lines (active & inactive) of the picture
HLage:	horizontal position of the displayed pixel
VLage:	vertical position of the displayed line
Entry:	Command memory allocation

DISPLAZE

DISPL	AZE
Software: Ser No.:	4.25 271
Operating Hours: 224	
Power ON: 28	

The information displayed in the DISPLAZE box shows the version of the software, the serial number of the software, the number of hours the unit has been in use and the number of times the unit has been turned on.

RS232



A simplex 3-core cable with the connections shown above is sufficient for controlling the **D1280AR** via the RS232 serial interface of a computer.

The RS232 interface uses the following parameters: 19200 baud null parity, 1 stop bit

Special features



Picture signals (RGB level) for the lines shown in text mode with the sampling times shown.

Oversampling is used for horizontal expansion. If the sampling time of the analog signal coincides with a signal edge, this pixel is shown on the TFT with correspondingly lesser brightness. In other words a colour transition is shown which is not present in the original resolution. Graphic cards with low-quality video clock generator can also lead to a flickering of the said colour transitions due to the low frequency stability of their signals. Depending on the screen content, local deterioration in the display accuracy may therefore occur in the expand mode.

These undesirable effects do not occur if an integer expansion factor is selected. A 640x480 mode is automatically expanded with the factor 2.0 on a 1280x1024 display. The picture is therefore displayed with no quality degradation.

Cables for D1280AR (not depending on display type)

Control:



Power:

HRS DF13-8P-1.25H		
	flat ribbon cable 8pol	
	> 600mm	

RGB-Input:



pin-header 10pol		HD-SUB15 male	cable 300mm
red	1	1	Coax 75R
GND	2	6	monitor
green	3	2	Coax 75R
GND	4	7	monitor
blue	5	3	Coax 75R
GND	6	8	monitor
VSync	7	14	
GND	8	5,10	
HSync	9	13	
Field	10	4	

Cable for	NL10276AC24-01/05	12,1"	XGA
	NL10276AC28-01	14,1"	XGA
	NL128102AC20-07	13"	SXGA

Backlight:

HRS DF13-10P-1.25H	JAE IL-Z-11S-S125C
flat ribbon cable 10pol assignment 1-10 10-1 JAE-Pin11 = NC.	
190mm	>

Display Power:



Display Control:

HRS DF13-14P-1.25H		JAE	IL-Z-13S-S125C3
	flat ribbon cable 13pol assignment 1:1		
	130mm		

Cable for NL6448AC33-15 10,4" VGA

RGB:



Backlight:



Display Control:

CS	
	E
	U

Display Power:



[금드] HRS DF13-6P-1.25H

JAE IL-Z-13S-S12	25C3	HRS DF13-12P-1.25H	HRS DF13-6P-1.25H
GND	1		4
CLK	2		6
GND	3		5
NC	4		
NC	5		
GND	6	3	
MODE	7	4	
VDD	8	2	
VDD	9	1	
VCCOFFO	10		2
GND	11	9	
VCC	12		1
GND	13	10	
	4,5 = NC	5,6,7,8,11,12 = NC	3 = NC

Cable for NL128102AC31-01 20,1" SXGA

Backlight Control:

HRS DF13-10P-1.25H

	HRS-Pin 7-10 = NC.	JAE	IL-Z-9S-S125C3
	flat ribbon cable 6pol		>
	assignment 1-6 6-1		
· · · · · ·	JAE-Pin 7,8,9 = NC.		
	190mm		

•		
JAE IL-Z-9S-S125C3		HRS DF13-10P-1.25H
		-
GND	1	6
GND	2	5
ACA	3	4
BRTC	4	3
BRTH	5	2
BRTL	6	1
NC	7	
NC	8	
NC	9	
		7-10 = NC

Backlight Power:



Display Power:



Display Control:



Cable for NL128102AC28-01 18,1" **SXGA** Backlight Control (CCFL): HRS DF13-10P-1.25H HRS-Pin 7-10 = NC. JAE IL-Z-9S-S125C3 flat ribbon cable 6pol assignment 1-6, 6-1 JAE-Pin 7,8,9 = NC. 190mm JAE IL-Z-9S-S125C3 HRS DF13-10P-1.25H GND 1 6 GND 2 5 3 ACA 4 BRTC 4 3 BRTH 5 2 BRTL 6 1 7 NC NC 8 NC 9

Backlight Power:



7-10 = NC

Display Control/Power (CN2, CN4):

HRS DF13-14P-1.25H



HRS DF13-12P-1.25H

HRS DF13-12P-1	1.25H (CN2)	HRS DF13-14P-1.25H (CN4)	JAE IL-Z-15S-S125C3
VDD	1		1
VDD	2		2
GND	3		3
GND	4		4
POWC	5		5
CNTSEL		2	6
CNTDAT		3	7
CNTSTB		4	8
GND		5	9
CNTCLK		6	10
CPSEL		7	11
CLAMP		8	12
GND		9	13
FIELD		10	14
GND		11	15
	612 = NC	1,12,13 = NC	

Cable for	NL10276AC30-01/03	15,0"	XGA
	NL128102AC23-02	15,4"	SXGA

Backlight:

HRS DF13-10P-1.2	25H	JAE IL-Z-11S-S125C3	
	flat ribbon cable 10pol assignment 1-10 10-1 JAE-Pin11 = NC.	>	
	190mm		 ■-

Display Control/Power (CN2, CN4):

HRS DF13-14P-1.25H



HRS DF13-12P-1.25H

HRS DF13-12P-1.25H (CN2)		HRS DF13-14P-1.25H (CN4)	JAE IL-Z-15S-S125C3
VDD	1		1
VDD	2		2
GND	3		3
GND	4		4
POWC	5		5
CNTSEL		2	6
CNTDAT		3	7
CNTSTB		4	8
GND		5	9
CNTCLK		6	10
CPSEL		7	11
CLAMP		8	12
GND		9	13
FIELD		10	14
GND		11	15
	612 = NC	1,12,13 = NC	