PLANAR

EL Display Development kit

USER'S MANUAL

www.planar.com

Revision Control	
Date	**Description**
JUNE 2006	Document number 020-0501-00 Rev. A

EL Display Development Kit

The Planar Systems, Inc. (Planar) EL Display Development Kit has two functions:

Demonstration use: The EL Display SGD (Small Graphics Display) demo program works with a standard PC computer that has a normal parallel port. The SGD demo program shows demonstration images and text files on the EL display.
The SGD Demo program may be freely distributed, without modification, for Planar display demonstration purposes.

Engineering development use: Instead of the PC parallel port the signal cable can be connected to a micro controller 8 bit I/O port for developing the EL display functions for customer's instrument use.

Installation and Handling

Handle the display with care. Please prevent flexing, bending or dropping the display. Prevent objects from striking the surface of the display.
The electronic components used in the display and the controller card are sensitive to electrostatics. Unpack, assemble, and examine these components in an electrostatics-controlled area only. When shipping, please use packing materials designed for protection of electrostatic-sensitive components.

Caution: To prevent injury in the event of glass breakage, a protective sheet overlay should be used on the viewing side of the display.

Warning: The EL displays generate voltages capable of causing personal injury (High Voltage up to 235 Vac). Do not touch the display electronics during operation.

Demonstration use

A printer must be disconnected from the parallel port before using the program. The program's default port is LPT1. The address of the port can be changed from the parameter.txt file.

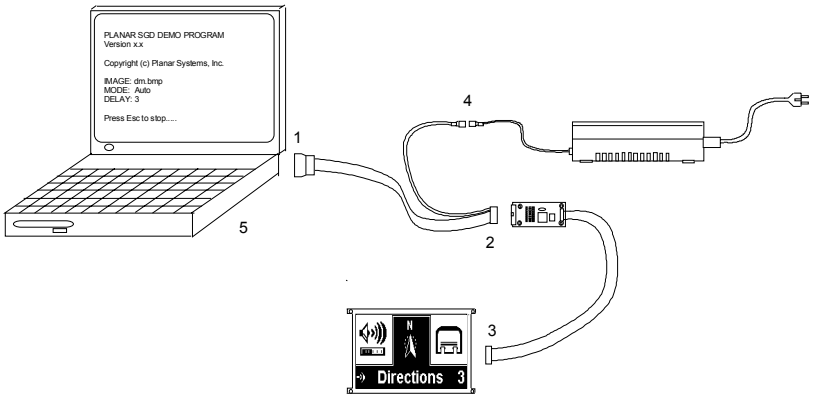
MSDOS, Win 3.x, Win95, Win98: The SGD demo program can be started directly without any installation from the appropriate sub-directory under MSDOS, Win 3.x, Win95 and Win98 operating systems.

Windows NT, 2000 and XP: The SGD Demo program can be accessed via the parallel port under Windows NT, 2000 and XP operating systems if a third party program is used, that enables access to the hardware level. For example this kind of third party Direct I/O (*) program can be purchased or an evaluation version downloaded from the following web site:
http://www.paule.de/

After Direct I/O program is installed. Open Direct I/O settings and add LPT1 I/O port's hexadecimal address range 378-37A (I/O Ports Tag) and appropriate executable SGD demo programs (SGD11.exe, SGD14.exe or SGD15.exe) to allowed processes (Security Tag).

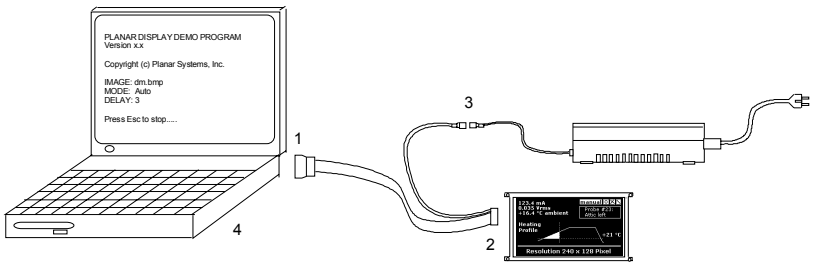
(*) Planar provides this information as a reference only, and does not imply any recommendation or endorsement of the product.

Start-up with the all EL displays except the EL240.128.45



1. Connect the demo cable to the parallel port of the PC (LPT1 is default).
2. Connect the demo cable to the S1D13700 display controller board.
3. Connect the flat cable between the display and the S1D13700 display controller board.
4. Connect the power supply to the display and the power cord to the wall socket.
5. Start the SGD demo program from the appropriate sub-directory.

Start-up with the EL240.128.45 display



1. Connect the demo cable to the parallel port of the PC (LPT1 is default).
2. Connect the demo cable to the EL240.128.45 display.
3. Connect the power supply to the display and the power cord to the wall socket.

Start the SGD demo program from the EL240.128.45 sub-directory.

SGD Demo program

The SGD Demo program contains the executable file of the program, D_script.txt and para.txt files as well as demo image and text file examples. All these files must be placed in the same subdirectory. The SGD Demo program reads bitmap images and text files from the mass storage and writes these to the display controller card via parallel port of the PC. The program supports 5 x 7 pixel characters, only. The width and height of the bit map image must be exactly the same as the matrix size of the display and the image must be a black and white 32-bit image without any gray shades.

D_Script.txt

The D_script.txt file includes a list of the demo images and the text files. If the image or the text is not found, the program displays an error message on the screen and halts execution. The first line of the file shows the delay time between images and text. This delay time must have two digits. The allowed delay time is between 01 - 99 seconds. If the time parameter is not correct, the program uses 8 seconds delay time.

Para.txt

The para.txt file includes parameters for the program and the display. The matrix size of the display (W, H) is inside parenthesis, the comma separates width and height dot counts of the display. The width and height dot counts must have three digits.

The program uses the parallel port address, which is marked with the asterisk (*). The default parallel port is LPT1.

The commands of the controller are marked with the number sign (#) and the parameters are marked with the equal character (=). The SGD Demo program reads all commands and parameters that are in the para.txt file and writes them to the display controller card. All the special signs and characters above are reserved for use with the commands and parameters, only.

Program versions

SGD11.exe is for the EL320.240.36-HB and EL640.200-SK displays. These displays contain an internal frame buffer. The frame rate and the display brightness are independent of user-supplied input data timing. There are two methods for dimming the EL320.240.36-HB and the EL640.200-SK displays. The both displays have digital and analog dimming input. The appropriate display user's manual has further details of the display dimming.

SGD14.exe is for the EL240.128.45 display that already incorporates a built-in SED133F standard LCD controller.

SDG15.exe is for the EL160.80.50, EL160.120.39, EL320.240.36 displays. With these displays the frame rate and the display brightness are dependent of the user-supplied input data timing.

Electromagnetic interference

The SGD demo system without an enclosure is sensitive for electromagnetic interference (EMI). As an example electric noise (unwanted electrical energy) may cause that the image on the display is not the correct one or that the controller card might receive wrong parameters or commands. To minimize a possible noise problem the program resends all display parameters after each picture. If the image is continuously distorted, the parallel port might be incompatible with the SGD Demo program or it might be broken.

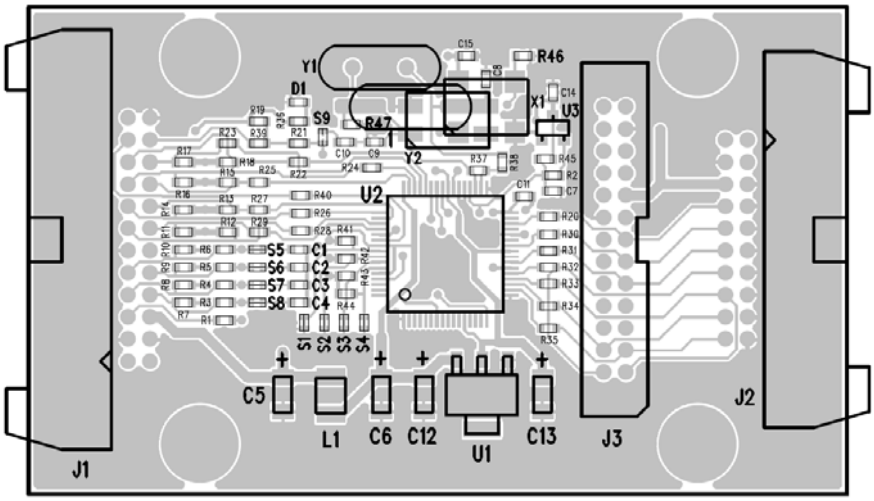
Engineering development use

The display controller card has the S1D13700F01 embedded memory graphics LCD controller. Please download the latest functional hardware specification at www.erd.epson.com before starting any development work. The schematics, bill of materials and cable drawings are in the enclosed CD.

Data input lines

The data input lines of the display controller are optimized for the slow speed parallel port. The filters and pull-up resistors in the display controller card improve immunity to noise and help the error free data transfer.

The display controller can be directly connected to the microprocessor interface. Faster writing speed to the display controller can be enabled by cutting the bridges S5-S8 of all filter capacitors. Please see picture 1.



Picture 1. Layout drawing of the S1D13700F01 display controller card. The dimensions of the controller card are 74x44 mm [2.91” x 1.73”] without the locking connectors.

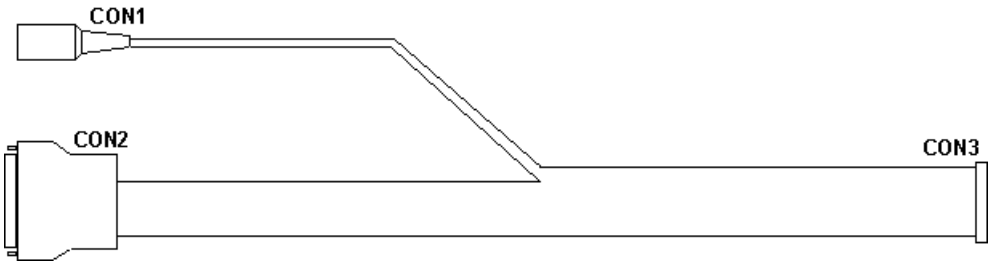
System set parameter

The enclosed CD contains system set parameter examples for the display. These parameters are in the para.txt file that is under appropriate display sub-directory. These system set parameters are made for the S1D1700F01 display controller that is using a 10 MHz crystal.

EL Development Kit Cables

The display and the S1D13700 display controller mating connector is the Samtec TCSD family of cables strips. Please find further information from the following Samtec web site: **http://www.samtec.com**

The PC-cable in the picture 2. The pin-outs of the power connector are shown in picture 3 and the PC-cable connections are shown in Table 1**.**



Picture 2. PC-cable. This cable is between a PC, power unit and the display controller.

PIN1 = GND
PIN2 = GND
PIN3 = +5 Vdc
PIN4 = NC
PIN5 = +12 Vdc

Picture 3. PC-cable power connector.

Table 1. PC-cable connection.

CON3	CON2	CON1	Description
1		5	VH
2		5	VH
3		1	GND
4		2	GND
5		3	VL
6	NC.		RES
7	1		/WR –> STB
8	16		/RD ->INIT
9	18		/CS ->GND
10	14		A0 ->AFD
11	19		GND ->GND
12	20		GND –>GND
13	2		DO->PD0
14	3		D1->PD1
15	4		D2->PD2
16	5		D3->PD3
17	6		D4->PD4
18	7		D5->PD5
19	8		D6->PD6
20	9		D7->PD7
21	21		AS# ->GND
22	11		WAIT ->BUSY
23	22		GND-GND
24	NC		NC

Description of Warranty

Seller warrants that the Goods will conform to published specifications and be free from defects in material for 12 months from delivery. To the extent that Goods incorporate third-party-owned software, Seller shall pass on Seller's licensor's warranty to Buyer subject to the terms and conditions of Seller's license.

Warranty repairs shall be warranted for the remainder of the original warranty period. Buyer shall report defect claims in writing to Seller immediately upon discovery, and in any event, within the warranty period. Buyer must return Goods to Seller within 30 days of Seller's receipt of a warranty claim notice and only after receiving Seller's Return Goods Authorization. Seller shall, at its sole option, repair or replace the Goods.

If Goods were repaired, altered or modified by persons other than Seller, this warranty is void. Conditions resulting from normal wear and tear and Buyer's failure to properly store, install, operate, handle or maintain the Goods are not within this warranty. Repair or replacement of Goods is Seller's sole obligation and Buyer's exclusive remedy for all claims of defects. If that remedy is adjudicated insufficient, Seller shall refund Buyer's paid price for the Goods and have no other liability to Buyer.

All warranty repairs must be performed at Seller's authorized service center using parts approved by Seller. Buyer shall pay costs of sending Goods to Seller on a warranty claim and Seller shall pay costs of returning Goods to Buyer. The turnaround time on repairs will usually be 30 working days or less. Seller accepts no added liability for additional days for repair or replacement.

If Seller offers technical support relating to the Goods, such support shall neither modify the warranty nor create an obligation of Seller. Buyer is not relying on Seller's skill or judgment to select Goods for Buyer's purposes. Seller's software, if included with Goods, is sold as is, and this warranty is inapplicable to such software.

SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE

Disclaimer

The SGD demo program is provided "as is" and it is without warranty of any kind. The author of this software program does not warrant, guarantee or make any representations regarding the use or results of use of this software in terms of reliability, accuracy or suitability for purpose. You assume the entire risk of direct or indirect, consequential or inconsequential results from the correct or incorrect usage of this software and the EL development kit even if the author has been informed of the possibilities of such damage. Neither the author nor anybody connected to this software and the EL development in any way can assume any responsibility. All information including schematic and bill of materials is for reference only. Planar Systems, Inc. is not responsible for any error in these document. All specification are subject to change without notice.

.

Ordering Information

Product	Part Number	Description
EL160.80.50 ET DevK	997-3317-00LF	Development kit with the EL160.80.50-ET display
EL160.120.39 DevK	997-3316-00LF	Development kit with the EL160.120.39 display
EL240.128.45 DevK	997-3319-00LF	Development kit with the EL240.128.45 display
EL320.240.36 ET DevK	997-3315-00LF	Development kit with the EL320.240.36 ET display
EL320.240.36 HB DevK	997-3314-00LF	Development kit with the EL320.240.36 HB display
EL640.200 SK DevK	997-3318-00LF	Development kit with the EL640.200 SK display

Design and specifications are subject to change without notice.

Planar Systems continues to provide optional, and in many cases custom, features to address the specific customer requirements. Consult Planar Sales for pricing, lead-time and minimum quantity requirements.

Support and Service

Planar is a U.S. company based in Beaverton, Oregon and Espoo, Finland, with a worldwide sales offices and distribution network. Full application engineering support and services are available to make the integration of Planar displays as simple and quick as possible for our customers.

RMA Procedure: For a *Returned Material Authorization* number, please contact Planar Systems, Inc. with the model number(s) and serial number(s) in advance to receive an RMA number. When returning goods for repair, please include a brief description of the problem, and mark the outside of the shipping container with the RMA number.

Planar Systems, Inc.

Customer Service

24x7 Online Technical Support: http://www.planar.com/support

Americas Support

1195 NW Compton Drive

Beaverton, OR 97006-1992

Tel: 1-866-PLANAR1 (866) 752-6271

Hours: M-F, 5am - 5pm Pacific Time

Europe and Asia-Pacific Support

Olarinluoma 9 P.O. Box 46

FIN-02201 Espoo, Finland

Tel: +358-9-420-01

Hours: M-F, 7:00am - 4pm CET

020-0501-00A