

# 1335 CONTROLLER FEATURES

## SED1335 ADVANCED LCD DISPLAY CONTROLLER

Seiko Instruments has selected the SED1335 to use as a built-in controller in our mid-size graphic modules. This CMOS LSI device generates all the signals required by the display memory and LCD drivers, and incorporates a character generator ROM. The command set within the SED1335 allows the user to create a layered display of characters and graphics, scroll the display, and assign display attributes to selected areas of the screen. The controller also functions as a pipeline buffer between the MPU and display memory so that low cost, medium speed SRAM can be used.

- This advanced LCD controller IC features:
- ▶ 6800 and 8080 family compatibility
  - ▶ 8-bit parallel buffered MPU interface (bi-directional)
  - ▶ Control of 64 K bytes of memory
  - ▶ Horizontal and vertical scrolling
  - ▶ Reverse video and flashing
  - ▶ Up to three layers of graphics
  - ▶ Up to two layers of mixed character & graphics
  - ▶ User defined characters & internal character generator
  - ▶ Supports external character ROM & RAM
  - ▶ Supports 8 x 8 or 8 x 16 pixel characters

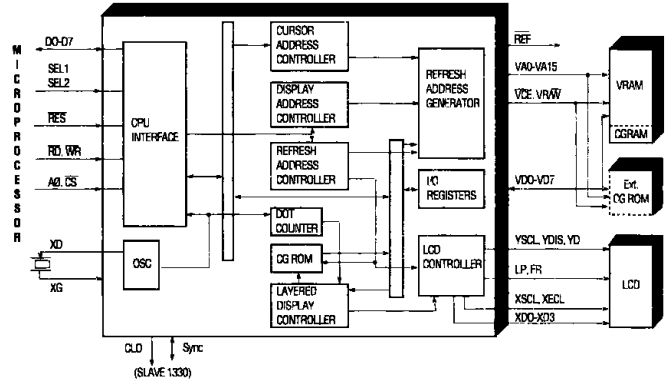
The new SED1335 controller, used in model G121C, has all of the same features as the SED1330. In addition, this new controller accommodates a +3.3 volt input.

The SED1335, shown in the block diagram, is located between the MPU and the display memory. This permits the MPU to send and receive control commands and data for display. The SED1335 can control up to 64 K bytes of display memory.

The on-chip LCD control circuit enables the SED1335 to exploit all the graphic features of the Seiko Instruments LCD modules, using the on-chip register functions with no external circuits.

The SED1335 divides its memory space into four areas:

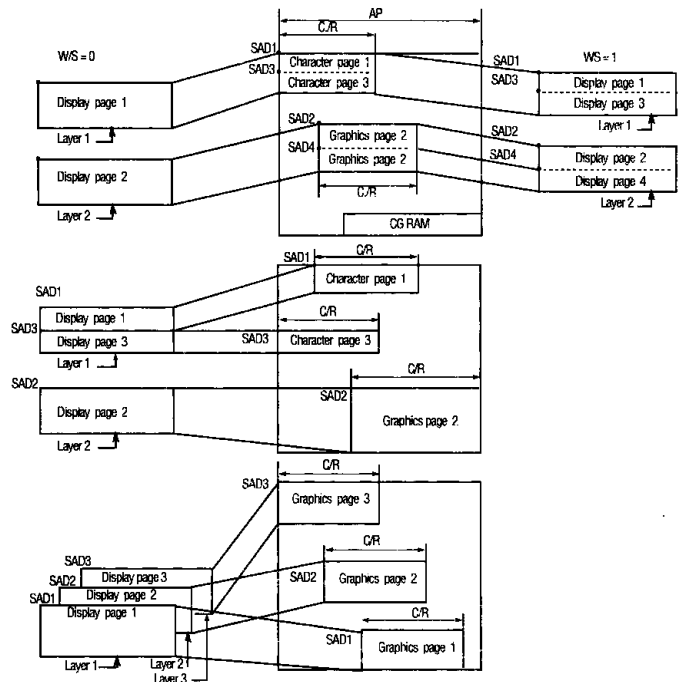
1. Character data table
2. Graphics data table
3. CG RAM table
4. External CG ROM table



Internal Block Diagram

The SED1335 supports virtual screens that are larger than the physical size of the LCD panel address range, C/R. A layer of the SED1335 can be considered as a window in the larger virtual screen held in display memory. This window can be divided into two blocks, with each block able to display a different portion of the virtual screen.

This enables, for example, one block to dynamically scroll through a data area while the other acts as a status message display area.



Display Layers and Memory