

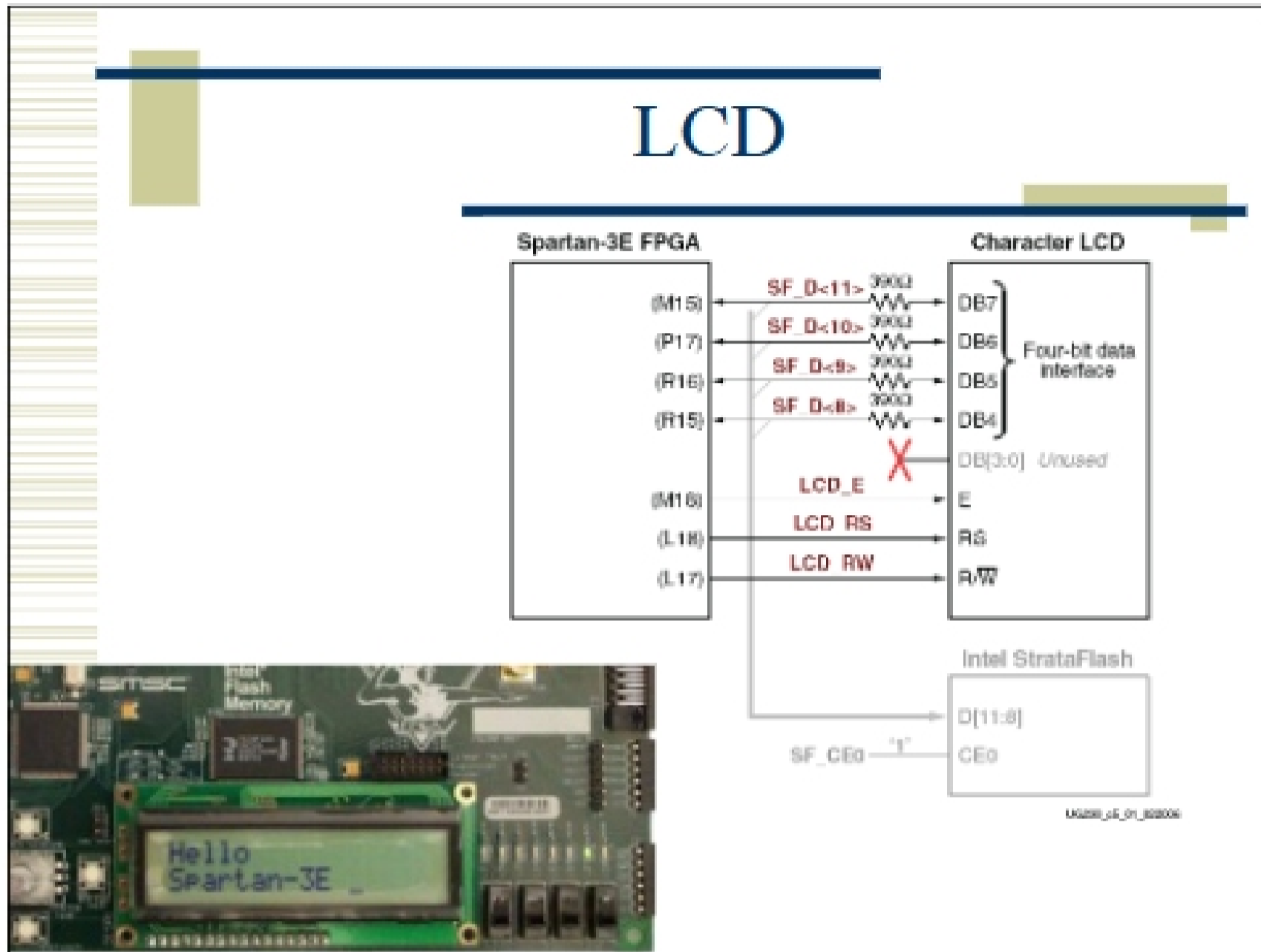
Other I/O

LCD display
Flash ROM
SPI EPROM
Keyboard (PS/2)
UART connectors
DAC
ADC

LCD Display

- ◆ 2-line, 16 character LCD display
 - 4-bit interface
 - Relatively easy to use once you have it mapped into your processor's memory-mapped I/O
 - Send characters to it, they show up on the screen
 - Not fast!
 - Scrolling at half-second intervals is about as fast as you can go and still have a clear display

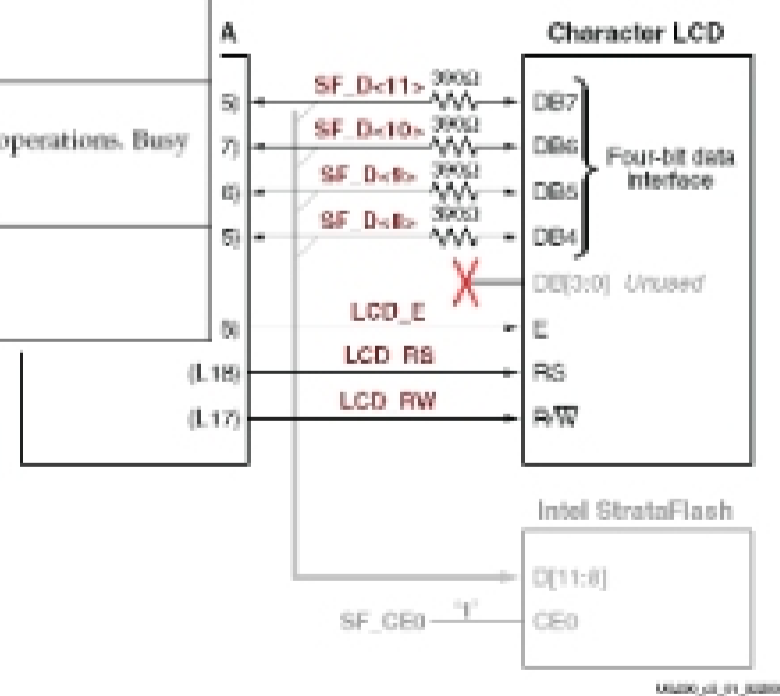
LCD



LCD Control

Table 5-1: Character LCD Interface

Signal Name	FPGA Pin	Function
SF_D<11>	M15	Data bit DB7
SF_D<10>	P17	Data bit DB6
SF_D<9>	R16	Data bit DB5
SF_D<8>	R15	Data bit DB4
LCD_E	M18	Read/Write Enable Pulse 0: Disabled 1: Read/Write operation enabled
LCD_RS	L18	Register Select 0: Instruction register during write operations. Busy Flash during read operations 1: Data for read or write operations
LCD_RW	L17	Read/Write Control 0: WRITE, LCD accepts data 1: READ, LCD presents data



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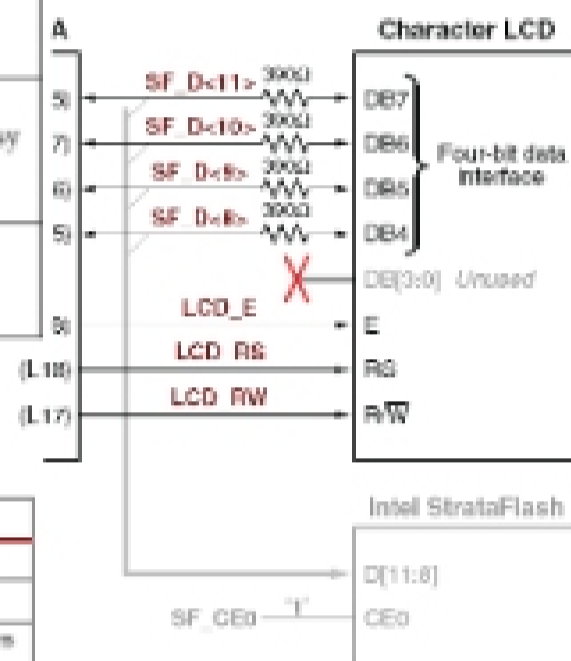


Table 5-2: LCD/StrataFlash Control Interaction

SF_CE0	SF_BYTE	LCD_RW	Operation
1	X	X	StrataFlash disabled. Full read/write access to LCD.
X	X	0	LCD write access only. Full access to StrataFlash.
X	0	X	StrataFlash in byte-wide (x8) mode. Upper address lines are not used. Full access to both LCD and StrataFlash.

LCD Data

- ◆ Three memory areas inside LCD
 - **DD RAM** – memory to hold the characters being displayed
 - Two rows of 16 characters to display
 - Also 24 extras per line that can be scrolled
 - **CG ROM** – Pre-defined character map
 - 192 pre-defined characters
 - **CG RAM** – RAM to hold 8 custom characters
 - 5x8 bit character/glyphs