

## 4. CONFIGURATION TABLES

### 4.1 Video Modes

Table 4-1. Standard VGA Video Modes

Mode No.	VESA® No.	No. of Colors	Char. × Row	Char. × Cell	Screen Format	Display Mode	Pixel Freq. MHz	Horiz. Freq. kHz	Vert. Freq. Hz
0, 1	0, 1	16/256K	40 × 25	9 × 16	360 × 400	Text	14	31.5	70
2, 3	2, 3	16/256K	80 × 25	9 × 16	720 × 400	Text	28	31.5	70
4, 5	4, 5	4/256K	40 × 25	8 × 8	320 × 200	Graphics	12.5	31.5	70
6	6	2/256K	80 × 25	8 × 8	640 × 200	Graphics	25	31.5	70
7	7	Monochrome	80 × 25	9 × 16	720 × 400	Text	28	31.5	70
D	D	16/256K	40 × 25	8 × 8	320 × 200	Graphics	12.5	31.5	70
E	E	16/256K	80 × 25	8 × 14	640 × 200	Graphics	25	31.5	70
F	F	Monochrome	80 × 25	8 × 14	640 × 350	Graphics	25	31.5	70
10	10	16/256K	80 × 25	8 × 14	640 × 350	Graphics	25	31.5	70
11	11	2/256K	80 × 30	8 × 16	640 × 480	Graphics	25	31.5	60
11*	11	2/256K	80 × 30	8 × 16	640 × 480	Graphics	31.5	37.5	75
12	12	16/256K	80 × 30	8 × 16	640 × 480	Graphics	25	31.5	60
12*	12*	16/256K	80 × 30	8 × 16	640 × 480	Graphics	31.5	37.5	75
13	13	256/256K	40 × 25	8 × 8	320 × 200	Graphics	12.5	31.5	70

**NOTE:** An 8 × 14 font for the EGA modes can be provided with a DOS TSR (terminate and stay resident) program. If the TSR has not been loaded when the mode is set, the 8 × 16 font is used with the two bottom rows deleted. This causes truncation of characters with descenders, but does not restrict program operation. The TSR should be used for absolute compatibility with DOS applications that use the 8 × 14 font.

\* Higher refresh modes available with generic fix-up TSR.

**Table 4-2. Extended Video Modes**

Mode No.	VESA® No.	No. of Colors	Char. × Row	Char. × Cell	Screen Format	Display Mode	Pixel Freq. MHz	Horiz. Freq. kHz	Vert. Freq. Hz
58, 6A	102	16/256K	100 × 37	8 × 16	800 × 600	Graphics	36	35.2	56
58, 6A	102	16/256K	100 × 37	8 × 16	800 × 600	Graphics	40	37.8	60
58, 6A	102	16/256K	100 × 37	8 × 16	800 × 600	Graphics	50	48.1	72
58, 6A	102	16/256K	100 × 37	8 × 16	800 × 600	Graphics	49.5	46.9	75
58, 6A	102	16/256K	100 × 37	8 × 16	800 × 600	Graphics	56.25	53.7	85.1
5C	103	256/256K	100 × 37	8 × 16	800 × 600	Graphics	36	35.2	56
5C	103	256/256K	100 × 37	8 × 16	800 × 600	Graphics	40	37.9	60
5C	103	256/256K	100 × 37	8 × 16	800 × 600	Graphics	50	48.1	72
5C	103	256/256K	100 × 37	8 × 16	800 × 600	Graphics	49.5	46.9	75
5C	103	256/256K	100 × 37	8 × 16	800 × 600	Graphics	56.25	53.7	85.1
5D†	104	16/256K	128 × 48	8 × 16	1024 × 768	Graphics	44.9	35.5	43†
5D	104	16/256K	128 × 48	8 × 16	1024 × 768	Graphics	65	48.3	60
5D	104	16/256K	128 × 48	8 × 16	1024 × 768	Graphics	75	56	70
5D	104	16/256K	128 × 48	8 × 16	1024 × 768	Graphics	78.7	60	75
5D	104	16/256K	128 × 48	8 × 16	1024 × 768	Graphics	94.5	68.3	85
5E	100	256/256K	80 × 25	8 × 16	640 × 400	Graphics	25	31.5	70
5F	101	256/256K	80 × 30	8 × 16	640 × 480	Graphics	25	31.5	60
5F	101	256/256K	80 × 30	8 × 16	640 × 480	Graphics	31.5	37.9	72
5F	101	256/256K	80 × 30	8 × 16	640 × 480	Graphics	31.5	37.5	75
5F	101	256/256K	80 × 30	8 × 16	640 × 480	Graphics	36.0	43.3	85
60†	105	256/256K	128 × 48	8 × 16	1024 × 768	Graphics	44.9	35.5	43†
60	105	256/256K	128 × 48	8 × 16	1024 × 768	Graphics	65	48.3	60
60	105	256/256K	128 × 48	8 × 16	1024 × 768	Graphics	75	56	70
60	105	256/256K	128 × 48	8 × 16	1024 × 768	Graphics	78.7	60	75
60	105	256/256K	128 × 48	8 × 16	1024 × 768	Graphics	94.5	68.3	85
64	111	64K	–	–	640 × 480	Graphics	25	31.5	60
64	111	64K	–	–	640 × 480	Graphics	31.5	37.9	72
64	111	64K	–	–	640 × 480	Graphics	31.5	37.5	75
64	111	64K	–	–	640 × 480	Graphics	36.0	43.3	85
65	114	64K	–	–	800 × 600	Graphics	36	35.2	56

Table 4-2. Extended Video Modes (cont.)

Mode No.	VESA® No.	No. of Colors	Char. × Row	Char. × Cell	Screen Format	Display Mode	Pixel Freq. MHz	Horiz. Freq. kHz	Vert. Freq. Hz
65	114	64K	–	–	800 × 600	Graphics	40	37.8	60
65	114	64K	–	–	800 × 600	Graphics	50	48.1	72
65	114	64K	–	–	800 × 600	Graphics	49.5	46.9	75
65	114	64K	–	–	800 × 600	Graphics	56.25	53.7	85.1
6C†	106	16/256K	160 × 64	8 × 16	1280 × 1024	Graphics	75	48	43i
6C	106	16/256K	160 × 64	8 × 16	1280 × 1024	Graphics	108	65	60
6C	106	16/256K	160 × 64	8 × 16	1280 × 1024	Graphics	126	76	71.2
6C	106	16/256K	160 × 64	8 × 16	1280 × 1024	Graphics	135	80	75
6C	106	16/256K	160 × 64	8 × 16	1280 × 1024	Graphics	157	91.1	85
6D†	–	256/256K	160 × 64	8 × 16	1280 × 1024	Graphics	75	48	43i
6D	–	256/256K	160 × 64	8 × 16	1280 × 1024	Graphics	108	65	60
6D	–	256/256K	160 × 64	8 × 16	1280 × 1024	Graphics	126	76	71.2
6D	–	256/256K	160 × 64	8 × 16	1280 × 1024	Graphics	135	80	75
6D	–	256/256K	160 × 64	8 × 16	1280 × 1024	Graphics	157	91.1	85
71	112	16M	–	–	640 × 480	Graphics	25	31.5	60
71	112	16M	–	–	640 × 480	Graphics	31.5	37.9	72
71	112	16M	–	–	640 × 480	Graphics	31.5	37.5	75
71	112	16M	–	–	640 × 480	Graphics	36.0	43.3	85
72#	–	16M+A	–	–	800 × 600	Graphics	36	35.2	56
72#	–	16M+A	–	–	800 × 600	Graphics	40	37.8	60
72#	–	16M+A	–	–	800 × 600	Graphics	50	48.1	72
72#	–	16M+A	–	–	800 × 600	Graphics	49.5	46.9	75
72#	–	16M+A	–	–	800 × 600	Graphics	56.25	53.7	85.1
73#	–	16M+A	–	–	1024 × 768	Graphics	44.9	35.5	43i†
73#	–	16M+A	–	–	1024 × 768	Graphics	65	48.3	60
73#	–	16M+A	–	–	1024 × 768	Graphics	75	56	70
73#	–	16M+A	–	–	1024 × 768	Graphics	78.7	60	75
73#	–	16M+A	–	–	1024 × 768	Graphics	94.5	68.3	85
74†	117	64K	–	–	1024 × 768	Graphics	44.9	35.5	43i†
74	117	64K	–	–	1024 × 768	Graphics	65	48.3	60

**Table 4-2. Extended Video Modes (cont.)**

Mode No.	VESA® No.	No. of Colors	Char. × Row	Char. × Cell	Screen Format	Display Mode	Pixel Freq. MHz	Horiz. Freq. kHz	Vert. Freq. Hz
74	117	64K	–	–	1024 × 768	Graphics	75	56	70
74	117	64K	–	–	1024 × 768	Graphics	78.7	60	75
74	117	64K	–	–	1024 × 768	Graphics	94.5	68.3	85
75	11A	64K	–	–	1280 × 1024	Graphics	75	48	43†
75	11A	64K	–	–	1280 × 1024	Graphics	108	65	60
75	11A	64K	–	–	1280 × 1024	Graphics	126	76	71.2
75	11A	64K	–	–	1280 × 1024	Graphics	135	80	75
75	11A	64K	–	–	1280 × 1024	Graphics	157	91.1	85
76#	–	16M+A	–	–	640 × 480	Graphics	25	31.5	60
76#	–	16M+A	–	–	640 × 480	Graphics	31.5	37.9	72
76#	–	16M+A	–	–	640 × 480	Graphics	31.5	37.5	75
76#	–	16M+A	–	–	640 × 480	Graphics	36.0	43.3	85
78	115	16M	–	–	800 × 600	Graphics	36	35.2	56
78	115	16M	–	–	800 × 600	Graphics	40	37.9	60
78	115	16M	–	–	800 × 600	Graphics	50	48.1	72
78	115	16M	–	–	800 × 600	Graphics	49.5	46.9	75
78	115	16M	–	–	800 × 600	Graphics	56.25	53.7	85.1
79	118	16M	–	–	1024 × 768	Graphics	44.9	35.5	43†
79	118	16M	–	–	1024 × 768	Graphics	65	48.3	60
79	118	16M	–	–	1024 × 768	Graphics	75	56	70
79	118	16M	–	–	1024 × 768	Graphics	78.7	60	75
79	118	16M	–	–	1024 × 768	Graphics	94.5	68.3	85
7A	–	64K	–	–	640 × 400	Graphics	25	31.5	70
7B	–	256/256K	200 × 75	8 × 16	1600 × 1200	Graphics	135	62.5	48†
7B	–	256/256K	200 × 75	8 × 16	1600 × 1200	Graphics	162	75	60

**NOTES:**

- 1) '†' character indicates interlaced mode.
- 2) '#' character indicates 16M colors, but with 32-bit-per-pixel format.
- 3) '+A' indicates 16M colors +Alpha channel.
- 4) Some modes are not supported by all releases of the CL-GD5464 BIOS. Refer to the *CL-GD5464 Software Release Kit* for the list of video modes supported by the CL-GD5464 BIOS.

- 5) Some modes are not supported by all monitors. The fastest vertical refresh rate for the monitor type selected is automatically used.
- 6) An 8 × 14 font for mode 55h is provided with a DOS TSR (terminate-and-stay resident). If the TSR has not been loaded when the mode is set, the 8 × 16 font is used with the two bottom rows deleted. This causes truncation of characters with descenders, but does not restrict program operation nor does it make characters particularly difficult to read. For absolute compatibility with some DOS applications that use the 8 × 14 font, the TSR should be used.

The DAC operating frequencies allow the CL-GD546X can achieve the refresh rates indicated in the following table. The Cirrus Logic BIOS supports the refresh rates noted in [Table 4-2](#).

**Table 4-3. Maximum Refresh Rates**

Resolution	170-MHz DAC	230-MHz DAC
1024 × 768	100+ Hz	100+ Hz
1280 × 1024	85 Hz	100+ Hz
1600 × 1200	60 Hz	85 Hz

## 4.2 Power-Up Configuration

On the trailing edge of RST#, the CL-GD546X samples the levels on certain pins. These levels are stored in a group of latches that establish fundamental operating characteristics of the device, such as host bus type.

These pins are pulled up with internal 250-kΩ pull-up resistors; the default configuration is '1'. A '0' is selected by installing an external 6.8-kΩ pull-down resistor on the corresponding pin. [Table 4-4](#) summarizes the Configuration bits and their functions for each of the two devices in the family.

**Table 4-4. CL-GD546X Configuration Bits**

CL-GD5462		CL-GD5464		Level		Description	Note
Pin Name	Pin No.	Pin Name	Pin No.	CL-GD5462	CL-GD5464		
P21	125	RA7	107		0	Pin Scan mode	
					1	Normal mode	
P18	128	RA3	102		0	Disable VGA operation	
					1	Enable VGA operations	
P20	124	RA2	101		0	RCLK drives VCLK	Factory test only
					1	Normal operation	
ROMCS#	62	ROMCS#	62		0	Motherboard mode	
					1	Add-On Card mode	

**Table 4-4. CL-GD546X Configuration Bits (cont.)**

CL-GD5462		CL-GD5464		Level		Description	Note
Pin Name	Pin No.	Pin Name	Pin No.	CL-GD5462	CL-GD5464		
RA3	102	RA1	100		0	Bypass mode	Factory test only
					1	Normal mode	
RA[5:4]	104, 103	RA[6:4]	106, 104, 103	00	000	C-CUBE CL480	VMI 'A'
					010	16-bit Intel® I/O port	
				01	011	No GPIO	VMI 'B'
					100	8-bit Intel® I/O port	
					001	CL-GD5464 only	VMI 'B'
				10, 11	101–111	Reserved	
n/a	n/a	RA8	108		0	Test mode	Factory test only
					1	Normal mode	
INTA#	205	INTA#	205		0	No interrupt claimed	
					1	Interrupt claimed	