Special requirements for operation of LCD monitors of 15 kHz and above – possible measures for interference-free operation

Contents

1 General situation

Components for the production of CRT monitors of 15 kHz and above are no longer manufactured, and we therefore had to stop production of such 15-kHz monitors.
Since older systems are still in use, and monitors of 15 kHz and above are still required, we have extended our "Industrial LCD monitors" for operation at 15 kHz and above.

- The **video signal** for the **CRT monitor** is processed and displayed **in analog mode**.

- With the **LCD monitor**, the **video signal** at the input is immediately **digitized**, and processed and displayed in digital mode.

These two technologies place **different requirements** on the **video signal** and **respond differently** to **non-standardized video signals**.

Caution

Apparently good pictures on CRT monitors may be displayed with interferences on LCD monitors.
CRT monitors cannot simply be replaced by LCD monitors!

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2 Requirements placed on video source

The following points must be observed in the system in order to guarantee correct operation of the LCD monitors.

2.1 Requirements placed on video signal for a good picture quality

Most video timings operate with sync on green. V-pulses, H-pulses and "Green" picture information are present on the same line and must be decoded by the electronics.
The max. level of the standard video signal is 1 V_{pp}, the pulses are between 0 V and +0.3 V, the picture information between +0.3 V and 1 V.

- The pulses should have steep edges, and interferences must not be superimposed on them.

- Red and blue should have the same level as green.

- Determine these requirements at the monitor input using an oscilloscope.

2.2   Controller

There are several development generations and versions for each controller (e.g. WF 470):

– For example, the video unit has different designs.

– There are controllers with a fixed output level, as well as ones with an output level controlled using potentiometers or plug-in jumpers (0.7 V; 1 V; 1.4 V).

– The programmed video timings may also differ depending on the application.

• You can obtain detailed information from the hotline responsible for the respective controller.

2.3   Cables and video switchers

Systems sometimes have an extremely complex design.

– Long video cables and various "black boxes" may be connected between the computer and monitor. The video signal can then no longer satisfy the requirements for a good picture quality.

• Measure the video signal at the monitor input using an oscilloscope.

2.4   Isolation between video ground and protective earth

Systems designed according to this principle can only be correctly operated using the SCD 1815-I 18" LCD desktop monitor (6GF6220-1MV).
All other 15-kHz products do not have isolation between the video ground and protective earth!

• Select correct monitor, make correct ground connections.

2.5   Electrical interferences

The interference susceptibility of digital and analog monitors differs.
The systems were previously defined for the analog technology of the monitors, and no LCD monitors existed then.
It is necessary to avoid possible interferences on the video signals:

• Check the ground connections

• Avoid earth loops

• Consult system experts.

3   Special measures for LCD monitors of 15 kHz and above

3.1   Input of video timing

The "AUTO-ADJUST" function was designed for pictures with a bright background, but not for pictures with a black background and little video information.
The consequence is that the monitor's processor cannot recognize the left picture edge.
This function in the OSD menu can be used for testing. If you do not achieve a good result, proceed as follows:

The OSD menu contains a function for entering the timing data. The timing table contains previously known data.

Note: these data may differ depending on the hardware version and the system software.

Procedure:

- Call OSD menu

- Select "Utilities" menu and "Installation RGB mode" submenu using Enter key.

- Enter video data (**see example for WF 470 system, Section 4.1**).

Notice

Contact the hotline if video data are missing or deviate, or contact a specialist to measure the timing data if necessary.

It may be necessary to optimize the picture using "Frequency" and "Phase".
If the picture is offset, select "Horizontal position" or "Vertical position".
Caution: these data are deleted by a factory reset!!! (please record data).

3.2   Processing of synchronization signals

The signal processor can be switched on and off using the switch "A5". This can process the synchronization signals, and filter out faults in certain phases of the signal in a number of cases.

- Test by switching the signal processing on and off.

3.3   Suppression of interfering signals

Changes in the H/V pulses trigger a change in the timing.
The monitor searches for the newly generated timing. This process takes 1 to 4 seconds, and the picture is not connected through for this period.
Interferences on the same pulses cause the same effect, and the picture fails for a longer period. This time can be significantly reduced using the "Suppress interfering signals" function.

- Call OSD menu. Select "Utilities" menu, "User setting" submenu, and then "Suppress interfering signals" using Enter key. Switch: ON/OFF.

4   Information/support

We hope that this additional information permits you to successfully operate your system with the LCD monitors of 15 kHz and above.

Please send new experiences/knowledge to the following address:

dt@siemens.com

We shall pass on this information for solving problems of the same type.

If you are unable to solve your problems, we can produce a quotation for support. We can also take back the LCD monitor within 8 weeks of delivery and with an operating period < 200 hours, and grant you a 100% credit less the treatment costs of the monitor.

5   Appendix

5.1   Setting parameters for LCD monitors of 15 kHz and above,
example: WF 470 system

Switch positions of BNC input sockets:
A1 = ON, A2 = OFF, A3 = ON, A4 = ON, A5 = ON

- Select "Utilities" menu using menu key.

- Select "Installation of RGB mode" using Enter key.

- Press ▲ key – the submenu is displayed.

Visible H-pixels = 512

- Use the ▼ ▲ keys to set the correct value.

- Press Enter key to confirm the set value.

Visible V-lines = 256

- Use the ▼ ▲ keys to set the correct value.

- Press Enter key to confirm the set value.

Total H-pixels = 768

- Use the ▼ ▲ keys to set the correct value.

- Press Enter key to confirm the set value.

Start H-pixels = 188

- Use the ▼ ▲ keys to set the correct value.

- Press Enter key to confirm the set value.

Start V-lines = 39

- Use the ▼ ▲ keys to set the correct value.

- Press Enter key to confirm the set value.

At the end of the adjustment procedure:

- Press ▲ key –
  an automatic adjustment is carried out using the entered parameters.

Note

It may be necessary to improve the picture using "Frequency" and "Phase".
If the picture is offset, adjust using "Horizontal position" or "Vertical position".

5.2 Timing list < 30 KHz

Note: these data are only known suggestions for timing data. Please contact your system administrator for deviating video data.

Type	Parameters for 15 kHz display versions					Resolution		Horiz. fr. kHz	Vert. fr. Hz	Clock MHz	H sync us	H backp us	H active us	H frontp us	H period us	V sync lines	V backp lines	V active lines	V frontp lines	V total lines
aa Designation ==>	Visible H-pixels	Visible V-lines	Total H-pixels	Start H-pixels	Start V-lines	H-pixels	V-pixels				Ha	Hb	Hc	Hd	He	Va	Vb	Vc	Vd	Ve
AS 230 / 235 / OS 252	448	288	637	75	23	448	288	15.625	50	10	4.9000	7	44.8	7	63.700	3	23	288	0	314
COROS LS-C	640	405	856	49	20	640	405	25.408	59.09	21.7502124	2.207	4.782	29.425	2.943	39.357	4	20	405	1	430
CP 526 high-resolution 50 Hz	640	468	840	34	72	640	468	31.1721	49.96	26.18657938	1.53	3.35	24.44	2.76	32.08	6	72	468	78	624
CP 526 high-resolution 60 Hz	640	468	848	37	23	640	468	30.8737	59.95	26.17586912	1.53	3.66	24.45	2.75	32.39	6	23	468	18	515
CP 526 low 50 Hz monochrome	640	234	848	84	38	640	234	15.4369	50.12	13.0959689	4.28	8.10	48.87	3.53	64.78	10	38	234	26	308
CP 526 low-resolution 50 Hz	640	234	848	58	36	640	234	15.4369	49.80	13.08793456	4.28	5.50	48.9	6.1	64.78	10	36	234	30	310
CP 527/50	640	234	848	84	38	640	234	15.432	50.10	13.08793456	4.25	8.100	48.9	3.55	64.800	10	38	234	26	308
CP 527/60	800	468	1061	46	40	800	468	30.864	59.93	32.73322422	1.53	4.600	24.44	1.83	32.400	6	40	468	1	515
CP 528 high-resolution 60 Hz	640	468	916	54	40	640	468	30.9148	60.03	28.31858407	1.55	5.36	22.60	2.84	32.35	6	40	468	1	515
DS 078	720	408	900	38	13	720	408	25.681	60.00	23.11173884	2.336	3.678	31.153	1.773	38.940	3	13	408	4	428
Mona S5	442	416	576	44	27	442	416	24.3055	54.38	14.00063351	4.54	4.04	31.57	0.99	41.14	3	27	416	1	447
MONA-C (Braumat PA 5700)	560	413	776	55	24	560	413	25.773	58.18	20	4.3	5.300	28	1.2	38.800	3	24	413	3	443
PC text mode	738	414	900	17	27	738	414	31.468	70.09	28.32143679	3.813	1.589	26.058	0.318	31.778	2	27	414	6	449
Prokon 1	640	432	904	50	26	640	432	25.478	53.75	23.03235326	3.473	4.863	27.787	3.126	39.249	16	26	432	0	474
Prokon 2	640	288	840	36	30	640	288	27.420	83.09	23.03235326	3.473	3.473	27.787	1.737	36.470	3	30	288	9	330
Prokon 3	640	432	840	36	30	640	432	27.420	58.97	23.03235326	3.473	3.473	27.787	1.737	36.470	3	30	432	0	465
Std. VGA	656	496	800	17	24	656	496	31.468	59.94	25.17461048	3.813	1.589	26.058	0.318	31.778	2	24	496	3	525
VDU 2000 Coros	720	405	963	50	20	720	405	25.407	59.08	24.4648318	2.21	4.870	29.43	2.85	39.360	4	20	405	1	430
WF 470	512	240	768	118	40	512	240	15.6250	49.14	11.99906257	5.33	11.33	42.67	4.67	64.00	3	40	240	35	318
WF 470	512	256	767	112	35	512	256	15.625	50.08	11.97660819	5.25	10.750	42.75	5.25	64.000	3	35	256	18	312
WF 470 old	512	240	768	110	36	512	240	15.6250	50.08	11.99906257	5.20	10.60	42.67	5.53	64.00	3	36	240	33	312
WF 470 new	512	245	768	111	34	512	245	15.6250	50.08	11.99906257	5.33	10.67	42.67	5.33	64.00	3	34	245	30	312
WF 480	580	480	816	35	22	580	480	30.637	59.96	25	1.76	3.440	23.200	4.24	32.640	4	22	480	5	511
WF 480 / Gracis	640	480	901	36	22	640	480	30.62		27.5862069	1.75	3.49	23.2	4.21	32.65	4	22	480	5	511

Std. video signal

1 Vpp
0.7 V
0.3 V

Hn/Vn

a	b	c	d
e = a+b+c+d			