SIEMENS

Control Panel SCD 1297-K (1)

Operating Instructions

SCD 1297-K (1) (Rack 19")
6AV8100-0BC00-0AA1
(Int.ID:6GF66240-7MA01)

SCD1297-KT (1)
6GF6240-7MB

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1. Overview

The SCD 1297-K is a control panel for PC-compatible computer systems and can be used as a man machine interface (MMI) platform for a wide variety of visualisation systems. Special interfaces make it possible to have the SCD 1297-K in a different location as the computer system. Ninety-four keys and a "finger mouse" are provided for software control and operation. The 94 keys can be individually configured.

The SCD 1297-K was developed and constructed especially for industrial applications. Its compact 19" rack format enables it to be used in applications where a complete computer system would be unsuitable, due to space or environmental restrictions or where the computer and operating interface must be in different rooms.

As is the case for all industrial systems, the SCD 1297-K has been designed to withstand the particular demands placed on such equipment, e.g., it is resistant to electromagnetic radiation and can withstand a large temperature range. The TFT-LCD display in this control panel minimises picture geometry distortion and colour patches. The screen remains flicker-free even at the low refresh rate of 50 Hz. Images of higher or lower resolution than that of the screen will be contracted or expanded to fit on the display.

The SCD 1297-K can display up to 256k (16.7 million using interpolation) colours simultaneously allowing true colour images and videos to be displayed without limitations. The SCD 1297-K contains special hardware to convert the incoming VGA signal into a form recognisable to the display controller thus guaranteeing compatibility with standard CRT monitors.

A clear and easy-to-use OSD (On Screen Display) is used to adjust the alignment of the display. The "Automatic Alignment" feature removes the necessity for tedious adjustments of picture position and phase, etc. At the press of a button, the monitor performs the alignment automatically.

The SCD 1297-K is equipped with an active 12.1" colour TFT display module with a resolution of 800x600 pixels. The VESA DPMS power management system allows significant reduction in power consumption when the synchronisation signal from the computer has been switched off, compared with that under "normal" operation.

1.1.   Layout of this Handbook

This handbook should be kept within reach when installing and operating the SCD 1297-K. It has been laid out so that even inexperienced users can find the information they require. Chapters are clearly arranged according to subject.

In detail, the chapters are arranged as follows:

- Chapter 1 Introduction

  This chapter provides a brief description of the SCD 1297-K, including its properties, application areas and special features.

- Chapter 2 Installation

  This chapter is mainly concerned with preparing the LCD monitor for use, its installation, cabling and connection with the computer system.

- Chapter 3 Operation

  All operation and adjustment possibilities for the SCD 1297-K are described here. Instructions on how to program the foil keys are also included.

- Chapter 4 Technical Data

  This chapter contains technical details such as dimensions, power supply, environmental considerations and EMC data.

Important: We have gone to great lengths to match the quality of the documentation to the high standard of this product. We are grateful for the support of our customers.

1.2.   Warnings and Safety Notes

Transport

The LCD monitor should only be transported in its original packaging. This is the only way to ensure it will be protected against shocks and rough treatment.

Setting up

When installing, it should be noted whether any moisture (condensation) has entered the unit during transport or storage. Additional important installation information can be found in the "Technical Data" chapter.

EMC

This is a Class A piece of equipment and conforms to the regulations concerning interference emission and interference resistance for industrial equipment.

Repairs

Before the unit is opened, it must be switched off and the power supply disconnected. Only authorised persons may open the unit.

Additions or changes to the unit may damage the system or affect its EMC behaviour.

Cleaning

The unit must be isolated from the power supply before cleaning. If heavily soiled, the SCD 1297-K can be cleaned with a damp cloth and mild detergent. Care must be taken to ensure that no moisture enters the unit during cleaning.

Scouring powders and solvents must never be allowed to come in contact with the unit. The inside of the unit is to be cleaned by qualified service technicians only.

1.2.1. Instructions for Handling Assemblies Susceptible to Electrostatic Shock

Most of the assemblies within the SCD 1297-K contain components which can be destroyed by electrostatic voltages. It is also possible for the assemblies to be damaged in such a way that total failure does not occur.

If you (as an authorised service technician) are handling such assemblies, then the following precautions should be observed:

- When such assemblies are being handled, a means of electrostatic discharge must be available. This can be, for example, an earthed object, which can be touched to discharge electrostatic voltages.

- This also applies to all tools used (insulated). They must also be discharged at an earthed object.

- When assemblies are removed or added to the system, the unit must always be switched off and the power supply cable unplugged.

- The vulnerable assemblies should always be held by their edge. Avoid touching tracks and contact pins.

2. General Installation

Preparation for installing the LCD monitor includes the following points:

- Removal of all packaging

- Checking of components for damage

- Comparison of components received with those on the delivery note

- Connection to the computer system and power supply

- Building into your system, bearing in mind technical and ergonomic aspects

2.1. Removal of Packaging and Checking of Individual Parts

After unpacking all the delivered components, they should be checked for completeness and for possible transport damage (visual inspection). If any deficiencies are found then please contact the service department given on the delivery note. Have the delivery note number, serial number and a description of the deficiency to hand.

The original packaging should be kept for future transportation.

2.2. Installation of the Monitor

The SCD 1297-K is a 19" rack module and is mounted in a standard 19" cabinet. Guide rails are not necessary.
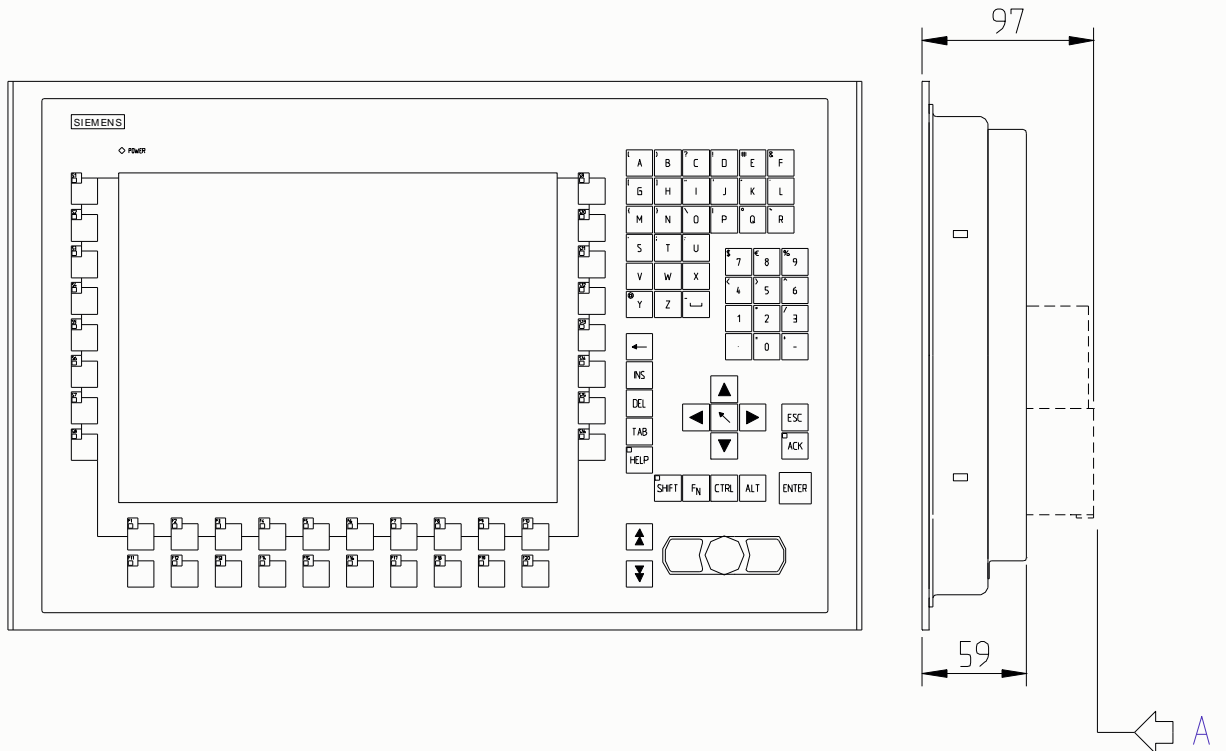
Ansicht A
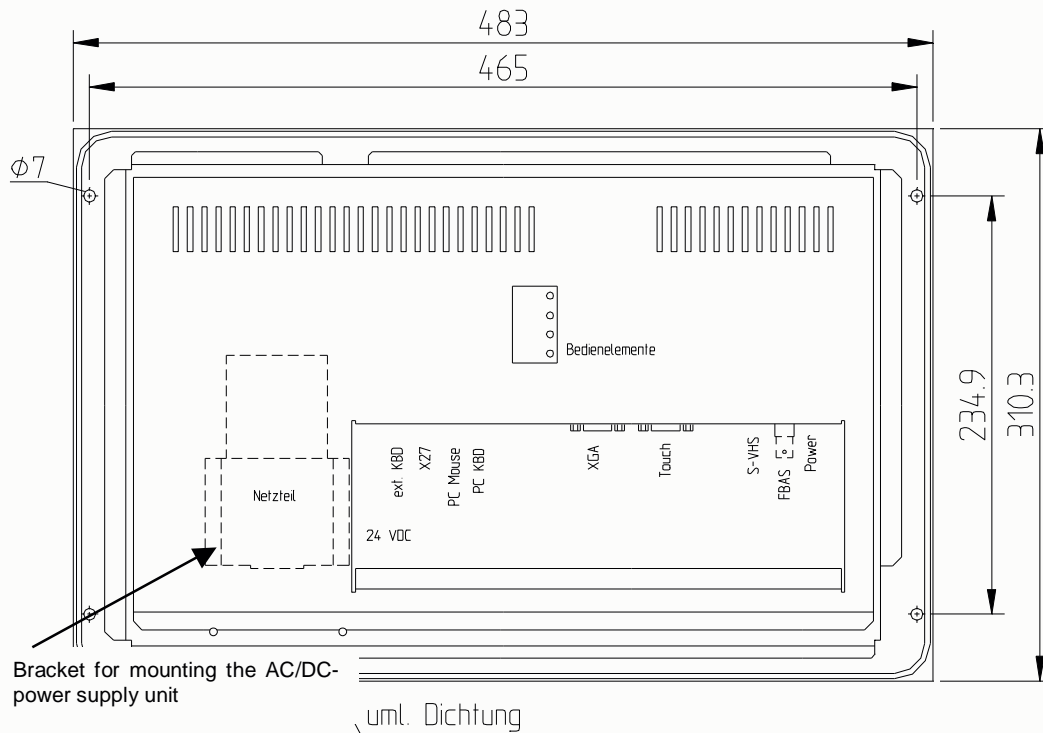
Bracket for mounting the AC/DC-power supply unit

Fig. 1: Dimensions of the SCD 1297-K

450

Schalttafelausschnitt

290

Thermal Problems

In order that the SCD 1297-K maintains an optimum operating temperature while in use, air must be allowed to circulate freely around the enclosure. This is especially important for the rear of the unit. A convection current must be allowed to circulate around the enclosure

Please bear in mind that increased temperatures can lead to defects and to a significant reduction in the lifetime of the monitor.

EMC Problems

This unit has been designed for building into an industrial system. The operator of the entire plant is responsible for maintaining electromagnetic compatibility according to EMC laws.

Safety Problems

All voltage and signal connections must ad here to legal requirements.

Ergonomics

The screen should be easily viewable from all sides without reflections.

A high-quality 75-ohm coaxial cable must be used for the VGA signals. Low quality cables can result in interference and shadowing on the display.

2.2.1. Installation of the AC/DC-power supply unit or 24V DC/DC Converter

Either an AC/DC power supply unit or a DC/DC converter can be used to supply the control panel with 24VDC. If an AC/DC power supply unit is used, it is attached to the enclosure using the bracket indicated in Fig. 1 on page 10

If the DC/DC converter, which is delivered with the unit, is to be used then it should be inserted below the AC/DC power supply unit shown in Fig. 1, so that the 24V connector is accessible. The DC/DC converter should then be screwed to the enclosure using to the two holes provided for the bracket.

Insert the DC/DC converter under the cover

Netztel

Screwholes for the DC/DC converter

The cable from the AC/DC power supply unit (12VDC) or from the DC/DC converter is plugged directly into the socket (power) on the SCD 1297-K. It should be secured using a pull-relief.

2.3. Interfaces

Buttons for OSD

X8   **X9** **X2** **X27** **X4** **X3** **X1** **X6**   **X7**
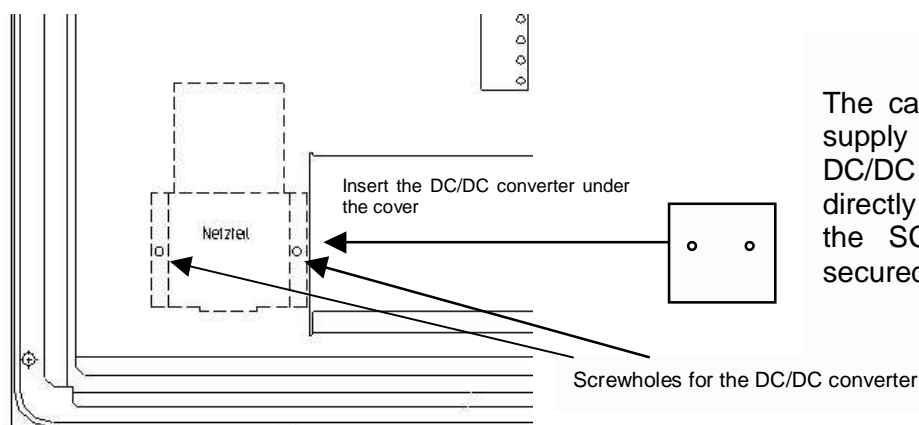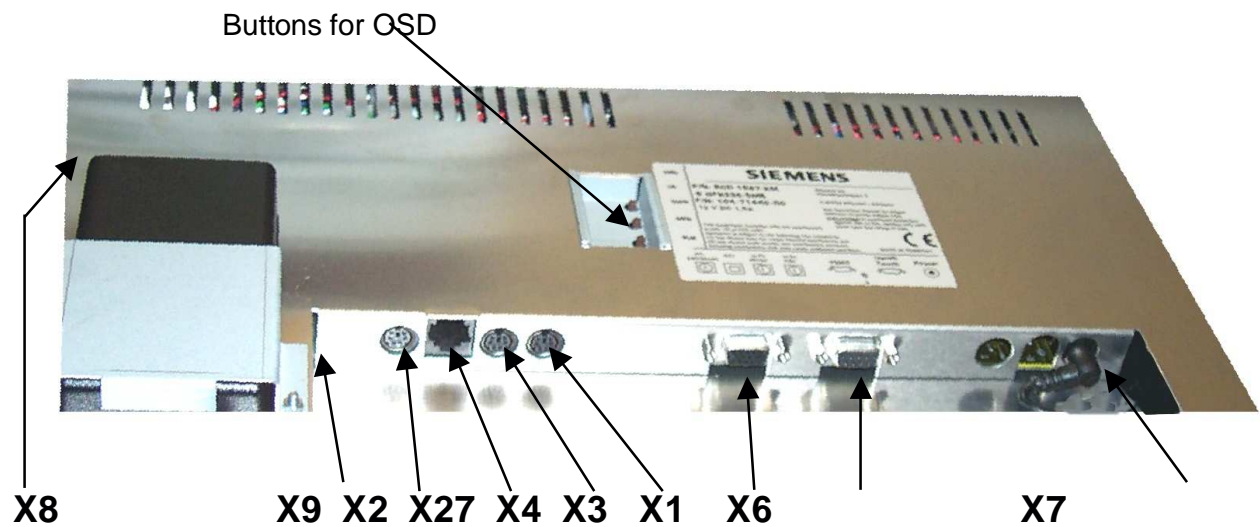
2.3.1. VGA-Interface X1

The VGA interface is a standard 15-pin female HD-D-type connector.

Pin	Signal
1	Video input RED
2	Video input GREEN
3	Video input BLUE
4	Not used
5	Not used
6	GND (RED)
7	GND (GREEN)
8	GND (BLUE)
9	Not used
10	GND
11	Not used
12	Not used
13	H-Sync.
14	V-Sync.
15	Not used
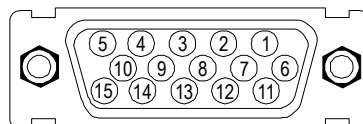
2.3.2. External Keyboard X2

A standard PS2 keyboard can be connected at the rear of the unit. This keyboard will then work in parallel with the built in keyboard on the front of the unit.

Pin	Signal
1	Data
2	-
3	GND
4	+5V
5	CLK
6	-

2.3.3. PC Interface Keyboard X3

This interface provides the keyboard connection to the computer system and is a standard PS2 female connector. A standard PS2 cable (male-male) with a maximum length of 5m should be used to connect the unit with the computer system.

Pin	Signal
1	Data
2	-
3	GND
4	+5V
5	CLK
6	-

2.3.4. PC Interface Mouse X4

This interface provides the mouse connection to the computer system and is a standard PS2 female connector. A standard PS2 cable (male-male) with a maximum length of 5m should be used to connect the unit with the computer system.

Pin	Signal
1	Data
2	-
3	GND
4	+5V
5	CLK
6	-

2.3.5. PC Interface Keyboard/Mouse (Long Distance) X27

This interface is used when the computer system and the control panel are separated by more than 5m. The mouse and keyboard signals are transmitted via a common cable. A standard CAT5/6/7 ethernet cable with an RJ45 connector is used. If this interface is used the PC must have a corresponding receiver which can convert the incoming signals back to standard keyboard and mouse signals (see page 17)

Pin	Signal
1	KBD-DATA+
2	KBD-DATA-
3	MOUSE-DATA-
4	KBD-CLK+
5	KBD-CLK-
6	MOUSE-DATA+
7	MOUSE-CLK-
8	MOUSE-CLK+
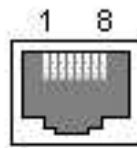
2.3.6. Service Connector X6

This female connector is used for updating the SCD 1297-K software.

2.3.7. Power Supply X7 / X8 / X9

Power is supplied to the SCD 1297-K via a DC connector, X7, on the rear of the unit. The DC input (12V) has been design to make it impossible to connect the supply voltage the wrong way round.

As described in Chapter 2.2.1 on page 12, the SCD 1297-K can be supplied using an AC/DC power supply unit or a DC/DC converter.

X7	DC input (12V)
X8	AC input (100-240V)
X9	DC input (24V)

2.4. Connecting to the Computer System

The monitor has been tested and set up at the factory. Therefore, all the remains to be done before using the unit is to connect all the necessary cables, such as the power supply, mouse, keyboard and video (VGA) to the connectors provided. These connections must adhere to EMC regulations.

There are two possible ways of connecting to the computer system. If the cable between the SCD 1297-K and the computer system is less than 5m long then standard PS2 cables can be used.

However, it should be noted that these interfaces have not been designed for industrial environments. External interference can affect the computer system or even put it out of operation. Use a X27 connection (see fig. 3)
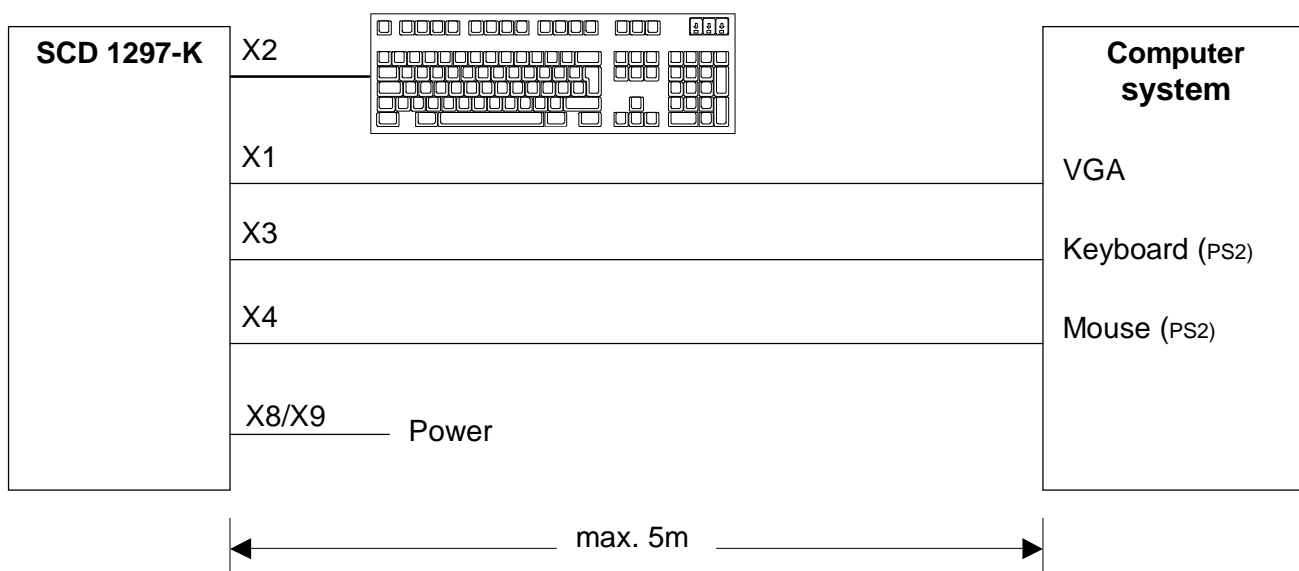

Fig. 2: Connecting the SCD 1297-K to the computer system over a short distance

If the control panel and the computer system are further apart or if there are strong interference fields in the vicinity then the second variation using the special interface (long distance, X27) should be used for the mouse and keyboard. Here, both mouse and keyboard signals are transmitted over one cable, a standard CAT 5/6/7 ethernet cable (note the signal configuration).
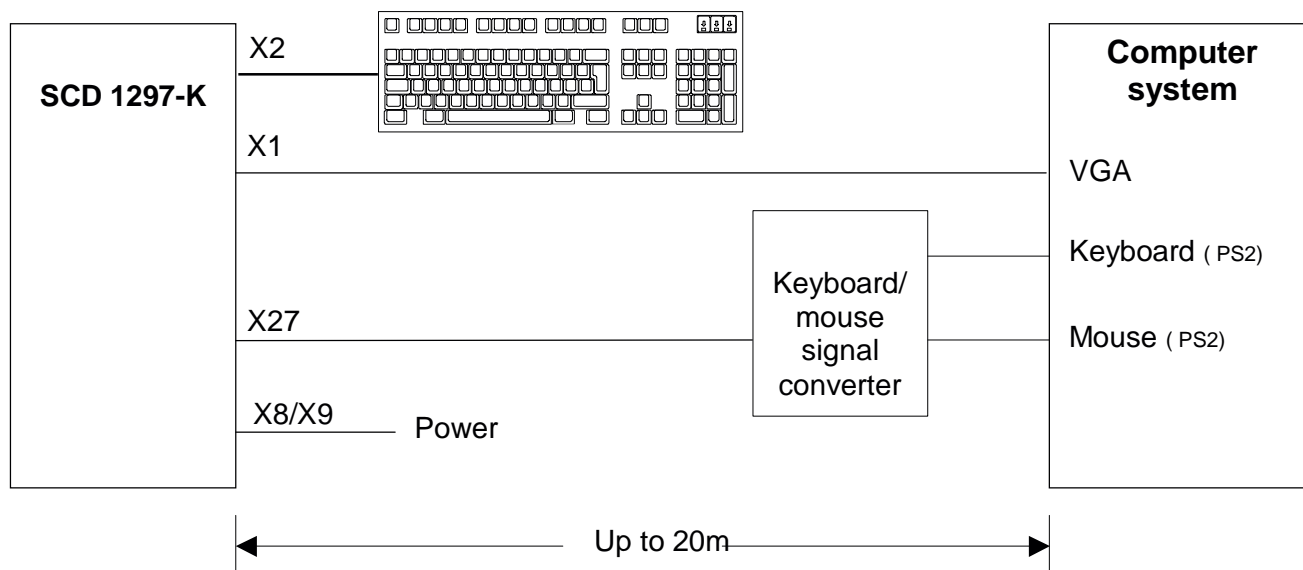
Fig. 3: Connecting the SCD 1297-K to the computer system over a longer distance

2.5. Electrical Installation

Before applying power to the SCD 1297-K, check that all connectors are plugged in correctly and secured. If a VGA signal is present, a picture should appear immediately on the display.

2.5.1. Installing the Keyboard and Mouse

When a computer starts up it usually checks and initialises the keyboard and mouse. If either is not connected or is connected incorrectly, the computer's start up procedure may stop or else the input device may not be available after it has been subsequently connected. This is especially applicable when a mouse is connected to a PC compatible computer after it has booted up.

The keyboard and/or the mouse should not be plugged in or unplugged while the computer is running. This could result in misinterpretation of the keyboard codes/mouse signals.

Therefore, the control panel should always be switched on before or at the same time as the computer system so that the keyboard and mouse are recognised and initialised correctly.

3. Operation and Alignment

This chapter contains a description of the operating and alignment functions.

3.1. Location of the Operation and Alignment Controls

The operating controls such as the keyboard and mouse are accessible from the front of the unit. Buttons for aligning the display are located on the rear of the unit. The location of the 4 keys for the OSD can be seen in Fig. 1: Dimensions of the SCD 1297-K on page 10. The display can also be aligned using an externally connected PS2 keyboard.

3.2. Integrated Foil keyboard

The integrated foil keyboard has 94 keys which can each be defined separately. The keys can be separated into two groups. One group consists of the so-called softkeys, which are located to the left of, to the right and above the display. These keys can be labelled with the help of a slide in strip. The second group of keys is already labelled.

The softkeys and the HELP, SHIFT and ACK keys also have an LED each which can be switched on and off via the keyboard interface.

3.2.1. Programming the Keys

All the keys in the integrated foil keyboard can be freely programmed. A small DOS program, "TCLOAD.EXE" is used to program the keys via the keyboard interface. The keys are defined in an editable list or an Excel table. This is read and interpreted by the DOS program, which then sends these definitions to the control panel.
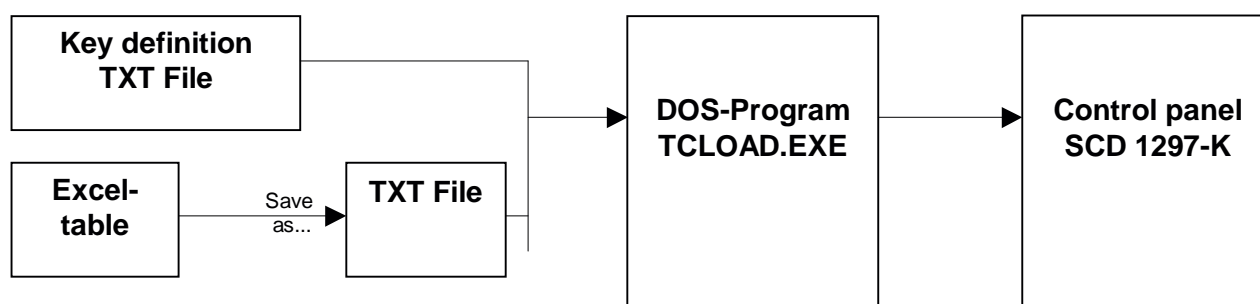
Important

The TCLOAD.EXE program can only read and process text files. Therefore, in Excel, it is necessary to save the table using "Save as..." and to select the file type "Formatted text (space delimited)".

3.2.2. Key Definition Table

Various keywords, characters and syntax are used in the table. The table, which is supplied with the control panel, contains definitions for all of the keys with permanent labels.

; Key table for control panel XXY at plant ZYX						
;						
#Name Simatictable 23						
;						
;Basic level, level 0						
;	X (0...11)	Y (0...7)	MF-II Key No.	Flags		Comments
	0	0	19	T	;	E
	1	0	38	T	;	K
	2	0	17	T	;	Q
	3	0	18	T	;	W
	4	0	11	T	;	0
	5	0	6	T	;	5
	6	0	83	T	;	Cursor Up
	7	0	76	T	;	Delete

Fig. 4: Key definition table

The table consists of a header in which the user can enter information as comments, the key definition table for the first key level and the key definition table for the second key level. The key, which will be used to switch between the two levels, is defined between the tables for the two key levels.

Keywords/characters

#Name   The table can be given a name here. This name is stored in the control panel and is used for subsequent identification of the loaded table.

#Level1   The key (co-ordinates) used to switch between the two levels follows this keyword.
Example: #Level1 8 6
i.e. the key, X=8, Y=6, will be used as the shift key.

;   A semi-colon indicates the start of a comment.

Syntax of a table entry

X key co-ordinate	Y key co-ordinate	Key number	Flag	Comment

The individual entries like X key co-ordinate and Y key co-ordinate must be separated by a space.

Key co-ordinates
This matrix co-ordinate specifies the key to be defined.

Fig. 5 on page 30 in the appendix shows all the SCD 1297-K keys and their co-ordinates.

Key number
The key number refers to the equivalent MF2 key. Fig. 6 on page 31 in the appendix shows the key numbers for a standard MF2 keyboard.
Only key numbers are exchanged between a computer and a keyboard. The definition of a key, i.e., whether a "Z" or a "Y" appears on the screen is determined by tables (keyboard drivers) stored in the computer.

Flags
The flags define specific behaviour, e.g., which control key should also be activated when this key is pressed:

R,r	Right shift key
L,l	Left shift key
G,g	AltGr key
A,a	Alt key
C,c	Control key / Strg key
T,t	Autorepeat, Typematic

Comment
Comments begin with a semi-colon character, ";". The end of line character (CR or CR/LF) indicates the end of the comment.

3.2.3. Programming the LEDs

The foil keyboard has 39 LEDs which are arranged in combination with some of the keys. These LEDs can be used, for example, as receipt or ready signals.
The LEDs are switched via the keyboard connection between the computer and the control panel, in a similar manner to the programming of the keys. A special command has been implemented for driving the LEDs since, in the MF2 specification, there are only NumLock, CapsLock and ScrollLock LEDs. This command enables the individual LEDs to be switched on and off.

The correlation between LED number and LED position is shown in
Fig. 5 on page 30.

The special command for LED data is 0xEA followed by 10 bytes of LED information.

Protocol

0xEA	B1H	B1L	B2H	B2L	B3H	B3L	B4H	B4L	B5H	B5L

0xEA : Special command
BxH, BxL : LED Information in ASCII-Hexformat (H= high, L=low)

Important: Each of the LED bytes, B1 to B5 is in ASCII hex format, i.e. for each LED byte, 'Bx', two bytes of data are transmitted.
For each byte that the contral panel receives from the computer, a receipt byte (oxFA) is sent back.

The correlation between the LED bytes B1 – B5 and the individual LEDs is shown below:

Byte	LED	Taste			Beispiel	Byte	LED	Taste			Beispiel
B1.0	LED40*			0	**,B1L'**	B3.4	LED20	F4	X	1	**,B3H'**
B1.1	LED39	Shift	X	1	A = 0x41	B3.5	LED19	F3	X	1	B = 0x42
B1.2	LED38	ACK		0		B3.6	LED18	F2		0	
B1.3	LED37	Help	X	1		B3.7	LED17	F1	X	1	
B1.4	LED36	F20	X	1	**,B1H'**	B4.0	LED16	S16		0	**,B4L'**
B1.5	LED35	F19		0	1 = 0x31	B4.1	LED15	S15		0	0 = 0x30
B1.6	LED34	F18		0		B4.2	LED14	S14		0	
B1.7	LED33	F17		0		B4.3	LED13	S13		0	
B2.0	LED32	F16	X	1	**,B2L'**	B4.4	LED12	S12	X	1	**,B4H'**
B2.1	LED31	F15		0	D = 0x44	B4.5	LED11	S11		0	D = 0x44
B2.2	LED30	F14		1		B4.6	LED10	S10	X	1	
B2.3	LED29	F13		1		B4.7	LED9	S9	X	1	
B2.4	LED28	F12		0	**,B2H'**	B5.0	LED8	S8		0	**,B5L'**
B2.5	LED27	F11		0	4 = 0x34	B5.1	LED7	S7		0	8 = 0x38
B2.6	LED26	F10	X	1		B5.2	LED6	S6		0	
B2.7	LED25	F9		0		B5.3	LED5	S5	X	1	
B3.0	LED24	F8		0	**,B3L'**	B5.4	LED4	S4	X	1	**,B5H'**
B3.1	LED23	F7	X	1	E = 0x45	B5.5	LED3	S3	X	1	F = 0x46
B3.2	LED22	F6	X	1		B5.6	LED2	S2	X	1	
B3.3	LED21	F5	X	1		B5.7	LED1	S1	X	1	

*: There is no LED40 on the foil keyboard.

ASCII - Kodierung: 0 ... 9 => 0x30 ... 0x39; A ... F => 0x41 … 0x46

Samples:

all LED „ON"
0xEA, 0x46, 0x46, 0x46, 0x46, 0x46, 0x46, 0x46, 0x46, 0x46, 0x46

all LED "OFF"
0xEA, 0x30, 0x30, 0x30, 0x30, 0x30, 0x30, 0x30, 0x30, 0x30, 0x30

Sampel (X= LED "ON"):
0xEA, 0x31, 0x41, 0x34, 0x44, 0x42, 0x45, 0x44, 0x30, 0x46, 0x38

3.3. Integrated Mouse (Finger-mouse)

The "finger-mouse" on the front of the control panel fulfils the same function as a standard Microsoft-compatible 2-button mouse. The mouse is moved using the central positioning surface. The surface should be pressed in the desired direction. The degree of pressure applied translates to the speed at which the mouse moves. The buttons to either side correspond to the left and right mouse buttons.

Left mouse button

Mouse positioning surface

Right mouse button
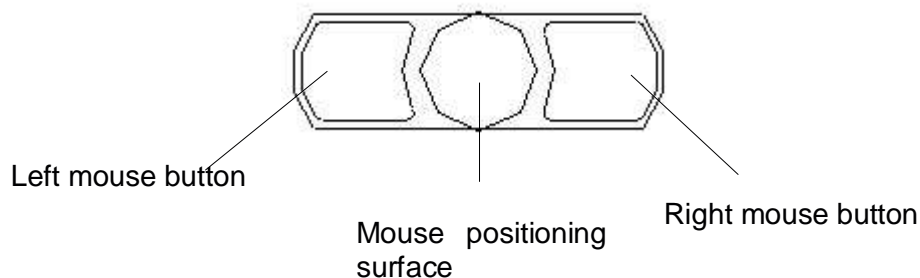
3.4. Display Alignment

Since there are no standards for video output signals from VGA cards, the first time the unit is switched on, it **automatically** adjusts to the graphic card in use.

3.4.1. Aligning the Display via an External Keyboard

As already mentioned, the OSD can be operated from an external MF2 keyboard. The cursor keys are used to navigate in the OSD (see **Fehler! Verweisquelle konnte nicht gefunden werden.**Keys for the OSD menu, on page **Fehler! Textmarke nicht definiert.**)

In order to activate the OSD via an external keyboard, the keys CRTL, ALT and "M" should be pressed **simultaneously**.

If no other keys are pressed within 10 seconds then the display switches back to the normal keyboard mode. The OSD also disappears from the display after around 10 seconds (depending on the setting in the utility menu).

3.4.2. OSD-Menu

The „On Screen Display" OSD is a menu system, which is shown on the display. With the help of OSD and the described controls elements, all adjustments of the monitor are executable. There are just 4 keys S1 to S4 to control the OSD.
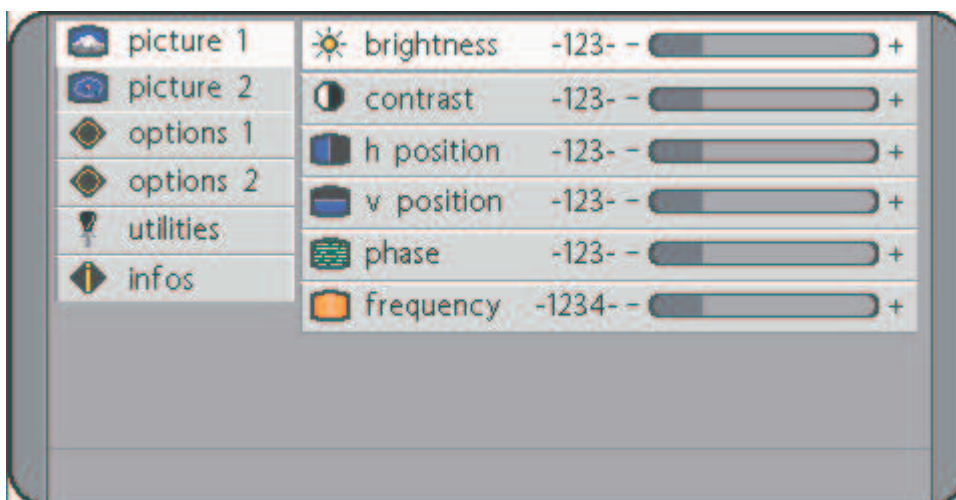
OSD-Menu / Quick-OSD-Menu

In addition to the **OSD** menu there are more possibilities to adjust important functions like brightness, contrast and automatic adjustment directly via a **Quick-OSD-menu.**

Function(s) of the control keys:

<+>

Increase value, menu navigation (go to sub menu / go to right)
Invoke Quick-OSD-menu: To execute an automatic adjustment

<->

Decrease value, menu navigation (go to left)
MENU

Invoke OSD
Menu navigation (switching between main- and sub-menu)
SET

Menu navigation (go down)
Invoke Quick-OSD-menu: Brightness and contrast adjustment

3.4.3. Quick-OSD-Menu-Functions

Following adjustments can do via the Quick-OSD-menu:

Brightnes   **Contrast**   **Auto adjust**

Invoke via key **<SET>**

Function	Adjustment/value	Description
Contrast	Range: 0 to 100 via key <+>/<->	Contrast adjustment
Brightness	Range: 0 to 100 via key <+>/<->	Brightness adjustment
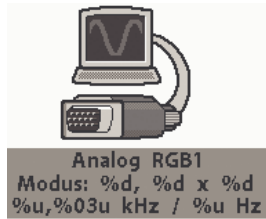
Invoke via key **<+>**

Function	Adjustment/value	Description
Automatic image adjustment	Press key <+> to start the adjustment	Perform an automatic image adjustment. Adjustment of frequency, phase and image position.

3.4.4. OSD-Menu-Function

Invoke via key **<MENUE>**

Main menu	Function	Adjust function / value / range	Description
Picture 1	Brightness	setting range: 0 to 100 through key (+/-)	adjust brightness
	Contrast	setting range: 0 to 100 through key (+/-)	adjust contrast change contrast between dark and light colors
	H Position	setting range: 0 to 100 through key (+/-)	move picture in horizontal direction
	V-Position	setting range : 0 to 100 through key (+/-)	move picture in vertical direction
	Phase	setting range : 0 to 31 through key (+/-)	adjust phase of input signal
	Frequency	setting range : 950 to 1050 (dependent to picture) through key (+/-)	adjust frequency of input signal
Picture 2	Sharpness	1, 2, 3, 4, 5	adjust sharpness of the picture by using no. 1 to 5 1=sharp, 5= soft
	Gamma	Linear or CRT	correction of gamma curve value of colors will be forwarded to the display
	Color temperature	5000 - 6500 – 9300 - VAR	color temperature / adjust color three defined and one adjustable color temperatures are for selection activate „VAR" - for RGB shows up a adjustment beam. 0 to 100 % (50% correspond to factor 1)
Option 1	OSD	select between nine defined OSD positions f	define position OSD
	OSD H-Position	setting range : 0 to 100 through key (+/-)	move OSD-menu in horizontal position
	OSD V-Position	setting range : 0 to 100 through key (+/-)	move OSD-menu in vertical position
	OSD timeout	5 ... 60 seconds	adjust time after the OSD menu is automatically fade out the adjustment ensures between 5 to 60 s in steps of 5 s.
	OSD background	Opaque – Transparent	select background color of the OSD menu you have the choice between transparent and colored background.
	Backlight	setting range : 0 to 100 through key (+/-)	adjust brightness ob backlight display herewith you can match the brightness of the picture with the brightness of the room.
	Noise suppression	ON - OFF	Standard adjustment OFF. By ON: Activate the function noise suppression. This function suppresses interference at the sync signal lines to avoid A new auto adjustment during short interference.

Main menu	Function	Adjust function / value / range	Description
Option 2	DPMS	ON – OFF	Display Power Management System (DPMS) on or off. If DMPS activated, the monitor is turn off (backlight) when a synch signal is left. The screen is dark.
	Source scan	OFF – ON – Standard	Standard: ON Note: To scan new video source is not relevant because the monitor has one RGB input source only.
	Blank color	red – reen – blue – black	Choose the background color of the screen when no input signal is present.
	Display	–	Display resolution (not from the input source)
	Info signal source	ON – OFF	Input source icon on or off The icon is shown when input signal are changed. The icon shows the following information's: - signal source (e.g. RGB analog) - Mode number (internal mode number of the timing list) - Image resolution of the input signal - H- and V-frequency Analog RGB1 Modus: %d, %d x %d %u,%03u kHz / %u Hz
Utilities	Language	Englisch – German	OSD language
	Calibration	<+> press	Adjustment of the internal A/D converter (following the menu instruction)
	Factory reset	<+> press	Reset of values like brightness, contrast,.. to default values
	Installation RGB-Mode	<+> press	Enter a new timing which is not in the internal timing table. This function should used, when the shown image resolution is not the resolution are expect. When press <+> the sub menu expect 9 timing parameter.
	When <+>, H- and V-Frequency	–	Show the H- and V-Frequency of the present input signal.
	H/V-total, H/V-start	–	Show the used timing parameter of the present input signal
	Option	Var. RGB-Mode inactive, Mode1, Mode2, Mode3	Inaktiv: used the internal timing table only Mode1: use the timing parameter and perform a complete auto adjustment. (usually used) Mode2: use the timing parameter and perform an auto adjustment without an automatic image position adjustment. Mode3: use the timing parameter and perform an auto adjustment without an automatic frequency adjustment.
	H-resolution	100 to 2000 through key (+/-)	Horizontal image resolution (important parameter)
	V-resolution	100 to 2000 through key (+/-)	Vertical image resolution (important parameter)
	H-total	100 to 2500 through key (+/-)	Whole pixel per line (important parameter)
	H-Start	0 to 750 through key (+/-)	Number of Pixels from H-sync start to image start
	V-Start	0 to 500 through key (+/-)	Number of lines from V-sync start to image start
	Install	<+> press	Activate the feed timing parameter
	test pattern	<+> press	Show a test image
Info	Firmware, Resolution, Timing	–	Show the firmware version and timing data of the present input signal

4. Technical Data

4.1. Display module

Type	Active colour TFT-LCD
Diagonal size	30.8 cm (12.1")
Display area (WxH)	246.0 x 184.5 mm
Resolution	800 x 600 pixels
Pitch	0.33 x 0.33 mm²
Colours	262144
Backlight	2xCCFT (Cold Cathode Fluorescent Tube)
Brightness (typical)	approx. 250 cd/m²

4.2. Power Supply

Input voltage DC (X7)	10 – 14VDC
Input voltage AC (X8)	100 –240 V AC, 50/60 Hz
Input voltage DC (X9)	18 – 36VDC
Power consumption DC(normal operation)	approx. 25 W
Power consumption DC(StandBy)	approx. 7 W

4.3. Operating Conditions

Operating temperature	+5 to +45°C
Storage temperature	-25 to +60°C
Humidity	Max. 95% (non condensing)

4.4. Protection

Protection class - front	IP65
Protection class - rear	IP20

4.5. Enclosure

Weight	approx. 4.5 kg
Enclosure material	Aluminium

4.6. Input Signal (Video)

Level	0.7Vss RGB analog at 75Ω
Bandwidth	140 MHz (-3 dB)
Impedance	75 Ω
Synchronisation	- Sep. Sync. (TTL) - Sync on green - Composite Sync
H frequency	30 to 75 kHz
V frequency	50 to 100 Hz

4.7. EU Declaration of Conformity on EMC

Product	LCD-Monitor SCD 1297-K	
Test foundations	EU framework guidelines	No. 89/336/EWG
		No. 92/031/EWG
		No. 73/23/EWG
		No. 93/68/EWG

Harmonised standards used	EN 50081-2 (EN55022 Class A)		Interference emissions
	EN61000-6-2 EN610003-2 EN610003-3		Interference resistance
	EN 60950	Edition 11/1997	Safety

This piece of equipment also fulfils the requirements of FCC Class A.

4.8. Additional Licensing

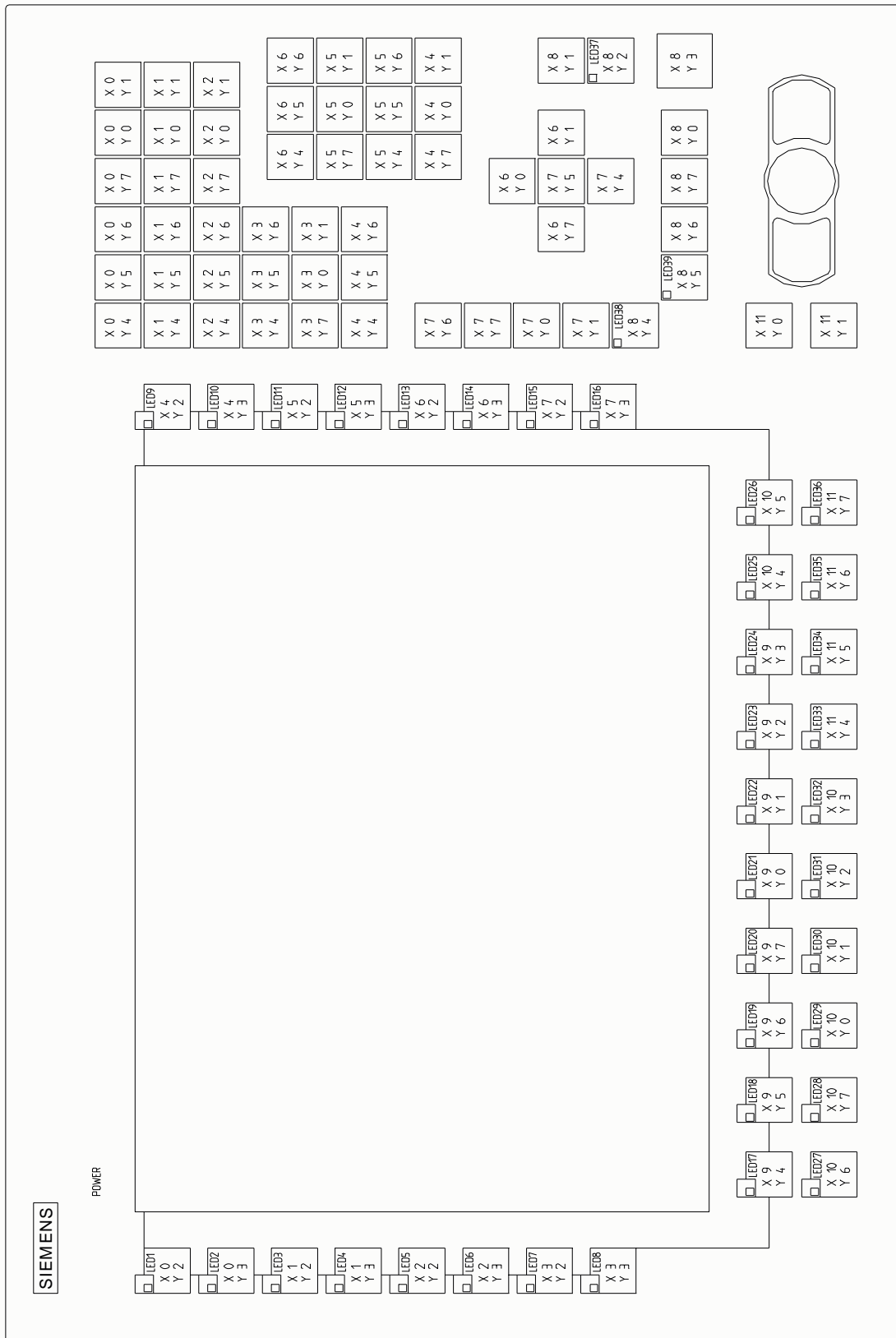This piece of equipment has CE, UL and CUL licensing (corresponds to CSA).
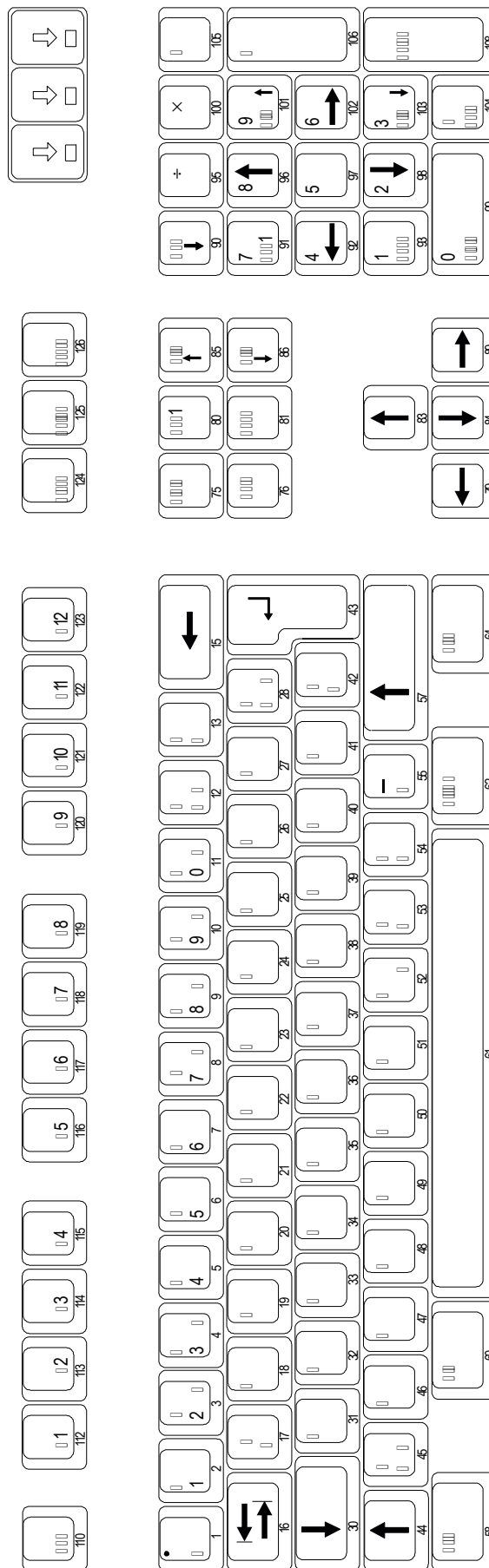
5. Appendix

Fig. 5: Keyboard matrix

Fig. 6: MF2 key numbers