

Control Panel

ETV 1921

The ETV 1921 control panel is an intelligent terminal used for programming and visualizing automated processes. Process diagnosis, operation and monitoring automated tasks are simplified using this terminal.

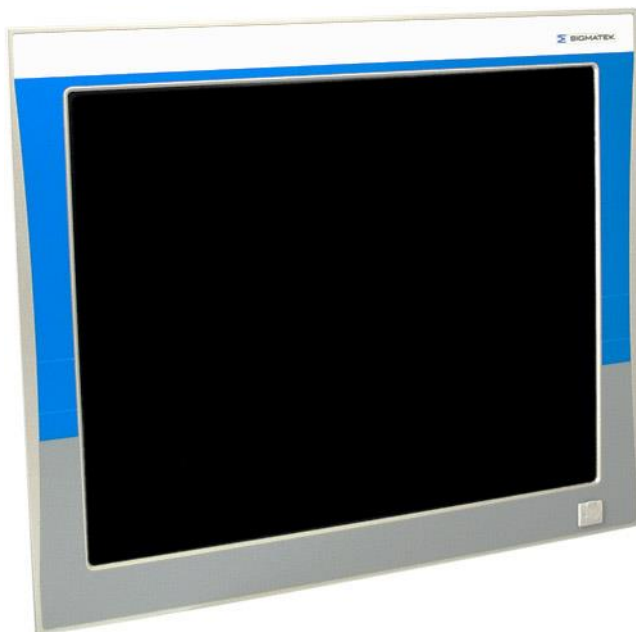
A touch screen serves as the input medium for process data and parameters. The output is shown on a 19" SXGA TFT color display.

Over the LSE mask editor, graphics can be created on the PC then stored and displayed on the terminal.

The interface connections provided can be used to transmit process data or configure the terminal. An internal Compact Flash is used to store the operating system, application and application data.

The integrated high-capacity VARAN bus can be use to control I/O modules directly.

When mounted correctly, the foam seal allows the front panel to protect the terminal from moisture.



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Technical Data

Performance data

Processor	AMD Geode LX 800
Cache	128 Kbytes 1 st Level 128 Kbytes 2 nd Level
BIOS	INSYDE BIOS
SDRAM (SO-DIMM 200pin)	128 Mbytes SDRAM (optional to 512 Mbytes) (16 Mbytes „Shared Memory“ for the graphic controller)
Internal program memory	10 MByte (128 Mbyte) / 10 Mbyte (512 Mbyte)
Internal data memory	87 MByte (128 Mbyte) / 471 Mbyte (512 Mbyte)
Compact Flash (Type I)	64 Mbytes (size optional)
SRAM	512 Kbytes (battery buffered)
Interfacing	1 x CAN-Bus 1 x DIAS-Bus 2 x VARAN-Bus (maximum length: 100 m) 1 x Ethernet 10/100 Mbit 2 x USB V2.0 Type A (Front + back)
Internal interfaces and devices	1 x TFT color display and inverter 1 x Touch 1 x Compact Flash Socket
Control panel	Touch Screen (Analog resistant)
Display	19" TFT color display SXGA, 1280 x 1024 Pixel
Data buffer	Lithium battery
Signal generator	Yes
Real time clock	Yes
Cooling	Passive (fanless)

Electrical requirement

Supply voltage	Minimum +18 V DC	Maximum +30 V DC
Current consumption of power supply	Typical 1,7 A (at +24 V) (With no external devices connected)	
Turn-on current	max. 20 A for <5 ms	

The device shall be supplied from an isolating transformer having a secondary listed fuse rated either:

- a) max. 5 amps for voltages 0~20 V (0~28.3 Vp), or
- b) 100 VA/Vp for voltages of 20~30 V (28.3~42.4 Vp).

Le module doit être alimenté par un transformateur d'isolement avec un fusible sur la sortie de l'enroulement secondaire dont les spécifications sont:

- a) max. 5 A pour des tensions 0 ~ 20 V (0 ~ 28,3 Vp), ou
- b) 100 VA/Vp pour des tensions de 20 ~ 30 V (28,3 ~ 42,4 Vp).

Terminal

Dimensions	452 mm / 384 mm / 58 mm (W / H / D)	
Material	Cover: 1 mm sheet steel, Chromated (alkaline blue)	Front plate: 6 mm Aluminum, Anodized (natural C0)
Weight incl. mounting brackets	Typically 10 kg	

Control unit

Touch foil	Analog resistant film glass touch panel
Active surface	376,3 mm x 301,1 mm
Resolution	12 Bit (4096 x 4096)
Data wheel	No
Buttons	No
LEDs	No
Signal generator	Yes

Display

Type	19" TFT color display
Resolution	SXGA, 1280 x 1024 Pixel
Color depth	18 Bit (262 144 colors)
Pixel size	0,294 mm x 0,294 mm
Active surface	376,3 mm x 301,1 mm
Background lighting	4 cold cathode tube (CCFT, switchable)
Contrast	Typically 1300 : 1
Brightness	Typically 300 cd/m ²
Viewable angle CR>10 von	Left and right 89°, upper and lower 89°

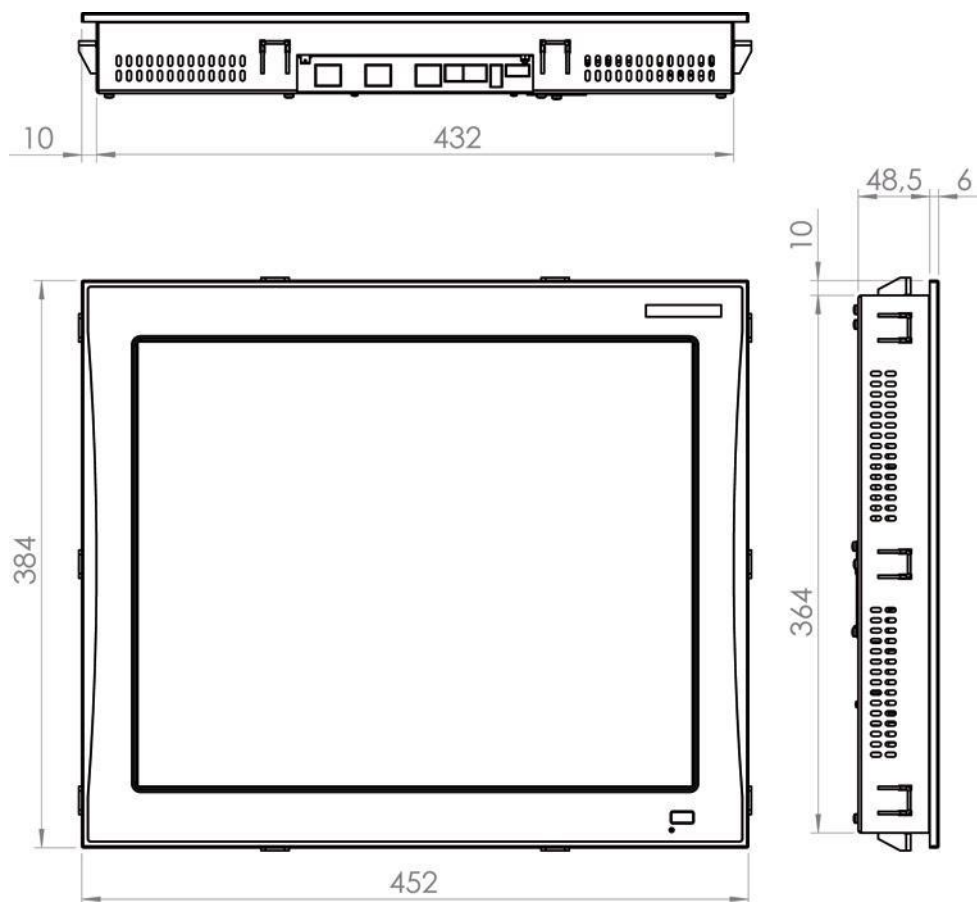
Miscellaneous

Hardware version	1.x
Article number	12-230-1921
Software macro	LSE LASAL operating system
Backup of the project	Internal on Compact Flash
Standardization	UL (E247993)

Environmental conditions

Storage temperature	-20 – +60 °C	
Operating temperature	0 – +45 °C	
Humidity	10 – 90 %, uncondensed	
EMV resistance	EN 61000-6-2 (industrial area): noise resistance EN 61000-6-4: noise transmission	
Vibration resistance	EN 60068-2-6	2-9 Hz: Amplitude 3,5 mm 9-200Hz: 1 g (10 m/s ²)
Shock resistance	EN 60068-2-27	15 g (150 m/s ²), Duration 11 ms, 18 shocks
Protection	EN 60529: protection through housing	Front: IP54 Cover: IP20

Mechanical Dimensions



The cover has a depth of 48.5 mm and mounts to the front plate!

Chemical Resistance

Front foil

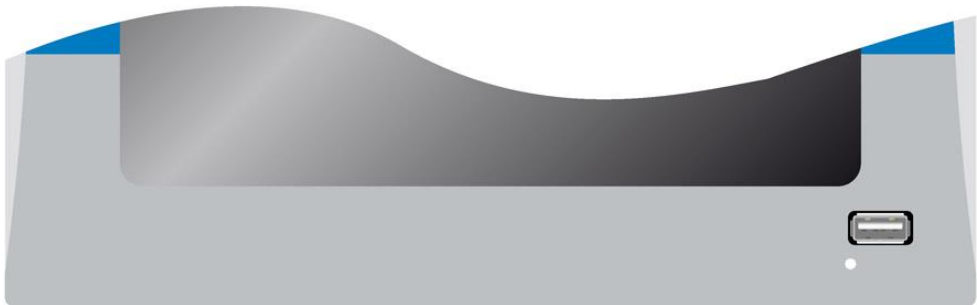
Solution	Effects over time	
	1 hour	24 hours
Methylethylketon	None	None
Cyklohexanol	None	None
Acetone	None	None
Ethanol	None	None
Benzyl alcohol	Yes	Yes
1.1.1.Trichloroethan (Genklene)	None	None
Perchloroethylene (Perklone)	None	None
Trichloroethylene	None	None
Ethylene chloride	Yes	Yes
Diethylether	None	None
Toluol	None	None
Xylol	None	None
Gasoline	None	None
Diesel oil	None	None
Nitric acid <10 %	None	None
Sodium hydroxide <10 %	None	None
Turpentine	None	None
Ethyl acetate	None	None

Touch foil

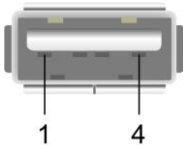
Solution	Visual effects
Coal tar oil / Toluol	None
Trichlorethylene	None
Acetone	None
Alcohol	None
Gasoline	None
Machine oil	None
Ammonia	None
Glass cleaner	None
Mayonnaise	None
Ketchup	None
Wine	None
Salad oil	None
Vinegar	None
Lipstick	None

Connector Layout

Front connections

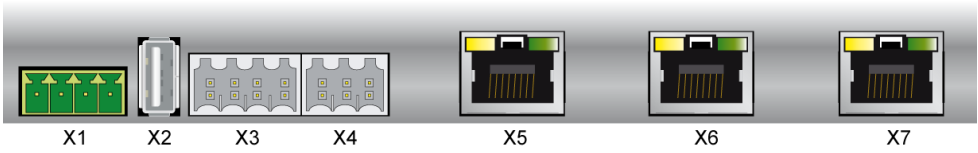


USB Type A V2.0

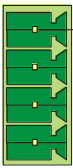


Pin	Function
1	+5 V
2	D0-
3	D0+
4	GND

Rear connections



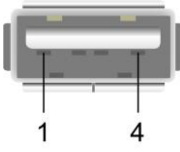
X1: Power supply (FK-MCP 1,5/4-ST-3,5)



Pin 1

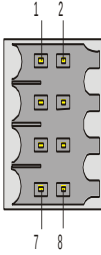
Pin	Function
1	+ 24 V supply
2	+ 24 V supply
3	GND
4	GND

X2: USB Type A V2.0



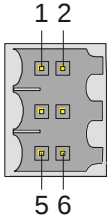
Pin	Function
1	+5 V
2	D0-
3	D0+
4	GND

X3: CAN (Weidmüller B2L/B2CF 3,5/8)



Pin	Function
1	CAN A (LOW)
2	CAN B (HIGH)
3	CAN A (LOW)
4	CAN B (HIGH)
5	GND
6	+5 V
7	GND
8	+24 V

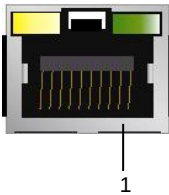
X4: DIAS-Bus (Weidmüller B2L/B2CF 3,5/6)



Pin	Function
1	MBUS+
2	MBUS-
3	SBUS+
4	SBUS-
5	GND
6	n.c.

n.c. = do not use

X5: ETHERNET (RJ45)



Pin	Function
1	Tx+
2	Tx-
3	Rx+
4 - 5	n.c.
6	Rx-
7 - 8	n.c.

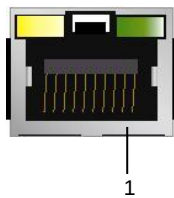
Problems can arise if a control is connected to an IP network, which contains modules that are not running with a SIGMATEK operating system. With such devices, Ethernet packets could be sent to the control with such a high frequency (i.e. broadcasts), that the high interrupt load could cause a real-time runtime error or runtime error. By configuring the packet filter (Firewall or Router) accordingly however, it is possible to connect a network with SIGMATEK hardware to a third party network without triggering the error mentioned above.

Des problèmes peuvent survenir si un automate est connecté à un réseau IP contenant des modules qui ne fonctionnent pas sous un système d'exploitation SIGMATEK. Avec de tels dispositifs, les paquets Ethernet peuvent être envoyés à l'automate avec une fréquence tellement élevée (càd. diffusion), que les interruptions ainsi générées peuvent provoquer une erreur d'exécution. En configurant d'une façon appropriée le filtre de paquets (pare-feu ou un routeur) il est toutefois possible de connecter un réseau avec le matériel SIGMATEK à un réseau tiers sans déclencher l'erreur mentionnée ci-dessus.

For use in local networks only, not telecommunication circuits.

Pour une utilisation dans les réseaux locaux uniquement, et non pas dans de circuits de télécommunications.

X6, X7: VARAN-Bus (RJ45)



Pin	Function
1	TX/RX+
2	TX/RX-
3	RX/TX+
4	n.c.
5	n.c.
6	RX/TX-
7	GND
8	GND

LEDs	Function
Yellow	ACTIVE
Green	LINK

n.c. = do not use

LED	Color	Description
ACTIVE	Yellow	Lights when data is received over the CAN bus.
LINK	Green	Lights when the connection between two PHYs is established.

More information over the VARAN bus can be found in the VARAN bus specifications!

Buffer Battery

The exchangeable buffer battery ensures that programs, data and the clock time (RTC) are preserved in the expanded memory (SRAM) in the absence of a supply voltage. A lithium battery is provided by the manufacturer.

The battery has enough capacity to preserve data for a period of 2 years in the absence of a supply voltage.

We recommend however, that the battery be changed annually to ensure optimal performance.

Battery order number: 01-690-052

	FIRM	DATA
Lithium battery	RENATA	3,0 V / 235 mAh

WARNING:

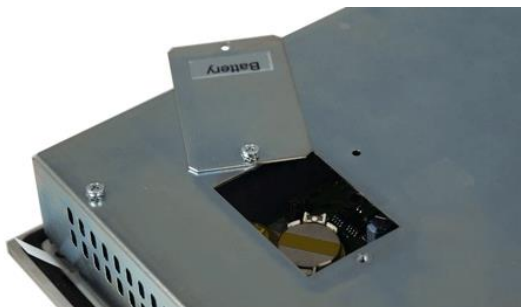
Use batteries from RENATA with the number CR2032 only!
Battery may explode if mistreated! Do not recharge, disassemble or dispose of in fire!

AVERTISSEMENT:

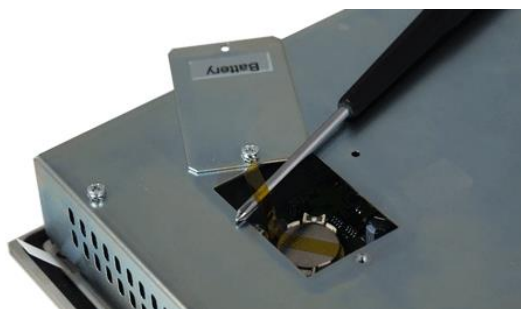
Remplacer la pile avec RENATA, modèle n° CR2032 uniquement! Utilisation d'une autre pile peut présenter un risque d'incendie ou d'explosion!

Exchanging the Battery

1. Turn off the power to the ETV.
2. Remove the locking screws with a PH1 screwdriver:



3. Remove the battery from the holder using the flap:



4. Insert the new battery with the correct polarity and mount the battery cover (+ Pole towards the back)

Note:

After of the +24V supply is turned off, the battery is buffered for 5 minutes. The battery must be changed within this time otherwise data will be lost and the device will no longer functions properly!

Attention:

Après avoir débranché l'alimentation +24 V, la pile est tamponnée pendant 5 minutes. La pile doit être remplacée pendant ce laps de temps sinon les données seront perdues.

Storage Media

It is recommended that only storage media provided by SIGMATEK (CompactFlash cards, microSD cards etc.) be used. The number of read and write actions have a significant influence on the lifespan of the storage media.

Il est recommandé d'utiliser uniquement les supports de stockage fournis par SIGMATEK (Cartes CompactFlash, cartes microSD, etc).

Cooling

The power loss from the terminal can be up to 41 Watts. Most of this heat is dissipated over the back panel of the housing. To ensure the necessary air circulation, the mounting instructions below must be followed.

Caution:

Because the back panel of the housing is used as the heat sink, its temperature can reach up to 25 °C.

Danger of injury!

Attention:

Parce que le face arrière du boîtier est utilisée comme dissipateur de chaleur, sa température peut atteindre jusqu'à 25°C.

Risque de blessure!

Mounting Instructions

The following distance from the housing should be maintained:

- Back, left and right 5 cm
- Above and below 10 cm

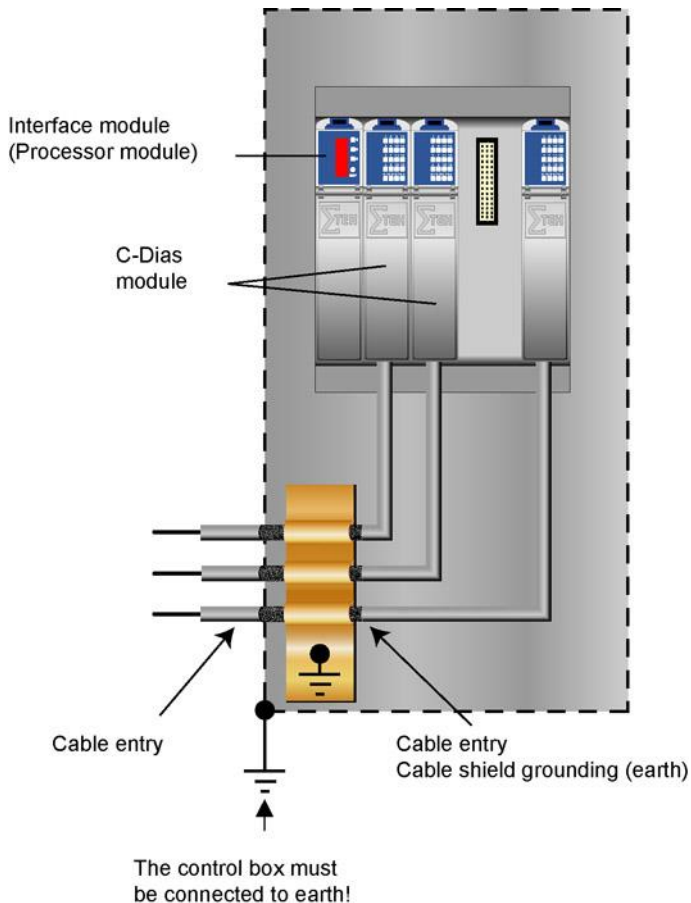
In addition, an orientation from 60° to 120° must be maintained.

Wiring Guidelines

1. Earth

The terminal must be connected to earth through the assembly on the control cabinet or over the connection provided. It is important to establish a low Ohm earth connection to ensure fault-free operation. The earth connection should have a maximum cross section and the largest (electrical) surface possible.

The earth connection must be able to absorb all signal noise that reaches the terminal over external lines. With a large electrical surface, high frequency noise can be removed (skin effect).



2. Shielding

The wiring of the CAN and DIAS buses should be shielded twisted pair wires. The shielding for the cables must be connected over a large surface and with low resistance directly to the earth clamp before the terminal or connected to earth over a blade terminal. For Ethernet and VARAN bus CAT5 cables with shielded RJ45 connectors must be used. The shielding on the CAT5 cable is connected to earth via the RJ45 plug connector.

This prohibits signal noise from reaching the electronics and disrupting the functions.

3. ESD protection

USB devices (keyboard, mouse...) are typically not wired using shielded lines. ESD surges can disrupt the function of these devices.

Before any device is connected or disconnected from the terminal, the potential should be dissipated over the earth bus (touch control cabinet or earth bus) so that electrostatic loads (through clothing or shoes) can be drained.

4. DIAS bus Termination

In a DIAS bus system, both end modules must have a line termination. This is required to avoid data transfer errors caused by reflections in the line.

The DIAS bus termination is already integrated into the terminal, therefore, an additional termination on the DIAS bus connector is unnecessary.
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5. DIAS bus with C-DIAS modules

To ensure a good bus connection, several guidelines must be followed:

- The cable used must be suitable for the transfer rate:
Data cable (10 MBit, 2 x 2 wire TWISTED PAIR, shielded)
I.e.: LAPPKABEL / UNITRONIC-BUSLEITUNG FD P LD
- Due to the internal termination resistance, the impedance of the cable must be 100 Ohms.
- With twisted-pair cables, the correct pairs must be connected with one another:
Cable 2x2 pair: pair 1 MBUS+, MBUS-
 Pair 2 SBUS+, SBUS-
- Both sides of the shielding must be connected to GND over the shortest route possible.
- In order to insert the individual wires in the connector, the insulation must be removed and the shielding moved to the side. The insulation and shielding should only be removed as far as needed.
- The sending and receiving modules must be connected to the same GND potential.

The Maximum length with a twisted-pair cable is 20m (with UNITRONIC BUS wire FD P LD / Fa. LAPPKABEL)

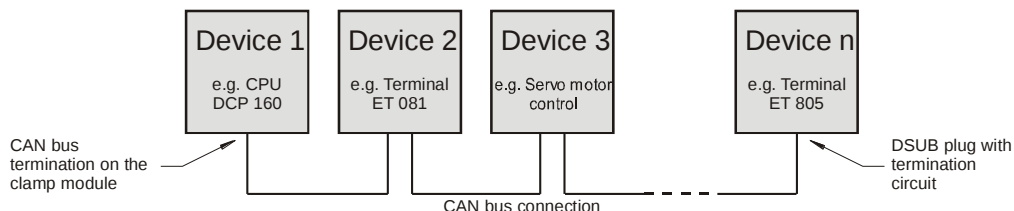
La longueur maximale totale d'un câble à paire torsadée est de 20 m (lors de l'utilisation UNITRONIC BUS FD P LD / Fa. LAPPKABEL).

6. DIAS bus with DIAS modules

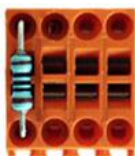
This terminal can also be connected to a DIAS module. A voltage supply, however, is required for the DIAS module (i.e.: DPS 001) as well as an adapter module to connect the twisted pair cable to the ribbon cable connector (i.e.: DKO 012 / 013).

7. CAN bus Termination

In a CAN bus system, both ends must be terminated. This is required to avoid transfer errors caused through reflections in the line.



If the terminal is one of the end modules, the termination can be made using a 150-Ohm resistor between CAN A (LOW) and CAN B (HIGH).



8. USB Interface

The terminal has 2 USB interfaces. These interfaces can be used for various USB devices (keyboard, mouse, storage media, hubs...) in LASAL. Several USB devices can be connected via hub, all completely functional in LASAL. However, for the BIOS setup, the following condition must be noted:

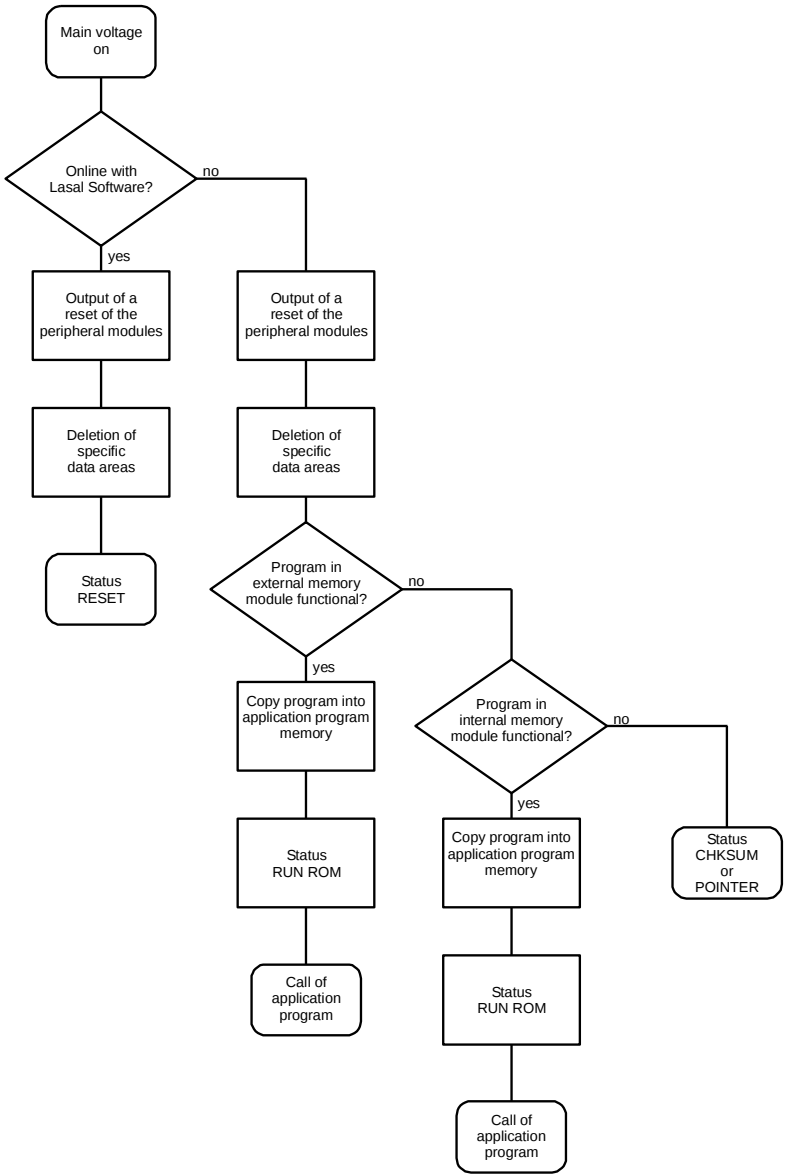
The BIOS setup is only operator-accessible, when the USB keyboard is directly connected to the USB connector. When using a USB hub, malfunctions can appear in the BIOS setup!

La configuration du BIOS est accessible uniquement si le clavier est connecté directement à la prise USB. L'utilisation d'un concentrateur USB peut provoquer des erreurs dans la configuration du BIOS!

It should be noted that many of the USB devices on the market do not comply with USB specifications; this can lead to device malfunctions. It is also possible that these devices will not be detected at the USB port or function correctly. Therefore, it is recommended that every USB stick be tested before actual use.

Il faut souligner que la plupart des périphériques USB sur le marché ne sont pas conformes aux spécifications USB, ce qui peut entraîner des dysfonctionnements de l'appareil. Il est également possible que ces dispositifs ne seront pas détectés par le port USB ou qu'ils ne fonctionnent pas correctement. Par conséquent, il est recommandé que chaque clé USB soit testée avant l'utilisation sur l'automate.

Process Diagram



Status and Error Messages

Status and error messages are given during the LASAL software status test. If the module is a CPU with a status display, the status or error code is also displayed. A POINTER or CHKSUM error is also shown on the terminal screen.

Number	Report	Meaning	Cause/Solution
00	RUN RAM	The user program is running in the RAM. The display is not affected.	
01	RUN ROM	The user program, which is located inside the memory module, has been loaded into the RAM and is running. The display is not affected.	
02	RUNTIME	Total duration of all cyclic objects exceeds maximum time; time can be configured by 2 system variables: - Runtime: time remaining - SWRuntime: preset value for runtime counter	
03	POINTER	Incorrect pointers were located before the user program was executed.	Possible causes: - Memory module is missing, not programmed or damaged. - Program in user program memory (RAM) is not executable. - Battery buffer broke down. - Software error, which overwrites the user program. Solution: - Reprogram the memory. Should the error reoccur, change the module. - Change buffer battery. - Correct program error.
04	CHKSUM	Wrong checksum was ascertained before execution of user program.	Cause/Solution: see POINTER

05	WATCHDOG	Program interruption by watchdog logic	Possible Causes: - Interrupts of user program blocked over a long period (command STI forgotten). - Defective hardware interrupt programming - Incorrect use of commands INB, OUTB, INW, OUTW - Processor damaged Solution: - Correct program error - Change CPU
06	GENERAL ERROR	General error	
07	PROM DEFECT	An error has occurred while programming the memory module	Possible causes: - Program memory module is defective - User program is too large - Program memory module is missing Solution: - Change program memory module
08	RESET	The CPU has detected the RESET signal and is waiting for further instructions. The user program is not run.	
09	WD DEFEKT	The hardware monitor (watchdog logic) is defective. The CPU tests the watchdog logic functions after start-up. If an error occurs during this test, the CPU goes into an endless loop and accepts no further instructions.	Solution: Exchange the CPU
10	STOP		
11	PROG BUSYS		
12	PROGRAM LENGTH		
13	PROG END	The memory module has been successfully programmed.	
14	PROG MEMO	The CPU is currently programming the memory module.	

15	STOP BRKPT	The CPU is stopped at a break point.	
16	CPU STOP	The PG software has stopped the CPU (F6 HALT in status test).	
17	INT ERROR	The CPU has triggered a false interrupt and the user program is interrupted or has encountered an unknown instruction.	Cause: - A non-existent operating system was used. - Stack error (unequal number of PUSH and POF instructions). - The user program was interrupted through a software error. Solution: - Correct program error
18	SINGLE STEP	The CPU is in single step mode and is waiting for further instructions.	
19	READY	A module or project was sent to the CPU and is now ready to execute the program.	
20	LOAD	The program is interrupted and the CPU is receiving a module or project.	
21	UNZUL. MODUL	The CPU has loaded a module that does not belong to the project.	
22	MEMORY FULL	The memory of the operating system (heap) is too small. No more memory could be reserved by a call to an internal function or an interface function from the application.	
23	NOT LINKED	At start-up, the program determined that a module is missing or does not belong to the project.	
24	DIV BY 0	A division error has occurred.	Possible cause: - Division by 0 - The division result does not fit in the register. Solution: - Correct program error.

25	DIAS ERROR	While accessing a DIAS module, an error has occurred.	Possible cause: - Access of a non-existing DIAS module. - DIAS bus error Solution: - Check DIAS bus - Check termination resistors
26	WAIT	CPU is busy.	
27	OP PROG	The operating system is being programmed.	
28	OP INSTALLED	Operating system is being reinstalled.	
29	OS TOO LONG	The operating system cannot be loaded; the memory is too small.	
30	NO OPERATING SYSTEM	Boot loader message. No operating system found in RAM.	
31	SEARCH FOR OS	The boot loader is searching for the operating system in RAM.	
32	NO DEVICE		
33	UNUSED CODE		
34	MEM ERROR	The operating system loaded does not correspond to the hardware configuration.	
35	MAX IO		
36	MODULE LOAD ERROR	LASAL module or project could not be loaded.	
37	GENERELLER BS-FEHLER	A general error has occurred while loading the operating system.	
38	APPLMEM ERROR	An error has occurred while managing the dynamic application memory (user Heap).	
39	OFFLINE		
40	APPL LOAD		
41	APPL SAVE		

45	VARAN ERROR	A required VARAN client was disconnected or a communication error with a VARAN client has occurred.	
46	APPL-LOAD-ERROR	An error has occurred while loading the application.	
47	APPL-SAVE-ERROR	Error in the application memory.	
50	ACCESS-EXCEPTION-ERROR	Read-write access to prohibited memory area, e.g. writing on NULL pointer.	
51	BOUND EXCEEDED	Exception error; memory range exceeded.	
52	PRIVILEGED INSTRUCTION	Prohibited instruction for the current SPU level. I.e.: setting the segment register.	
53	FLOATING POINT ERROR	Error during a floating-point operation.	
60	DIAS-RISC-ERROR	Error from the intelligent DIAS master.	
64	INTERNAL ERROR	Internal error. All applications stopped.	Restart, report error to Sigmatek.
65	FILE ERROR	Error during file operation.	
66	DEBUG ASSERTION FAILED	Internal error	Restart, report error to Sigmatek.
67	REALTIME RUNTIME	Total duration of all real time objects has exceeded maximum time. The time cannot be configured. 2 ms for 386 CPUs 1 ms for all other CPUs	From Version 1.1.7
68	BACKGROUND RUNTIME	Total duration of all background objects exceeds the maximum time. The time can be configured using two system variables: -BTRuntime: time remaining -SWBTRuntime: preset for Runtime counter	
70	C-DIAS ERROR	An error occurred in connection with a C-DIAS module.	Cause: - The reason for this error is documented in the log file Solution: - Depends on the cause

72	S-DIAS ERROR	A connection error with a S-DIAS module has occurred.	Possible causes: - real network does not match the project - S-DIAS client is defective Solution: - analyze logfile
95	USER_DEFINED 0	User-defined code	
96	USER_DEFINED 1	User-defined code	
97	USER_DEFINED 2	User-defined code	
98	USER_DEFINED 3	User-defined code	
99	USER_DEFINED 4	User-defined code	
100	C_INIT	Start of initialization. Configuration is executed.	
101	C_RUNRAM	The LASAL project was successfully started by the RAM.	
102	C_RUNROM	The LASAL project was successfully started by the ROM.	
103	C_RUNTIME		
104	C_READY	Everything OK.	
105	C_OK	Everything OK.	
106	C_UNKNOWN_CID	Unknown class from a stand-alone or embedded object, or an unknown base class.	
107	C_UNKNOWN_CONSTR	The operating system class cannot be created; possibly the wrong operating system has been loaded.	
108	C_UNKNOWN_OBJECT	Indication of an unknown object in an interpreter program. More than one DCC080 object has been created.	
109	C_UNKNOWN_CHNL	The number of the HW module is larger than 60.	
110	C_WRONG_CONNECT	No connection to the required channels.	
111	C_WRONG_ATTR	Wrong server attributes	

112	C_SYNTAX_ERROR	No specific error. Recompile all project sections and reload.	
113	C_NO_FILE_OPEN	An attempt was made to open an unknown table.	
114	C_OUTOF_NEAR	Error in the memory allocation.	
115	C_OUT OF_FAR	Error in the memory allocation.	
116	C_INCOMAPTIBLE	Object with the same name, but another class already exists.	
117	C_COMPATIBLE	Object with the same name and class already exists, but has to be updated.	
224	LINKING	Application is being linked.	
225	LINKING ERROR	An error has occurred while linking. An error message is displayed in the LASAL status window.	
226	LINKING DONE	Link ended.	
230	OP BURN	Operating system is burned into the flash memory.	
231	OP BURN FAIL	An error has occurred while burning the operating systems.	
232	OP INSTALL	Operating system is being installed.	
240	USV-WAIT	Power supply was disconnected; UPS is active.	
241	REBOOT	Operating system is restarted.	
242	LSL SAVE		
243	LSL LOAD		
252	CONTINUE		
253	PRERUN	Application is started.	
254	PRERESET	Application is ended.	
255	CONNECTION BREAK		

Additional addressing can be found in the VARAN bus specifications.

VARAN Recommended Shielding

The VARAN real-time Ethernet bus system offers robust performance in harsh industrial environments. Through the use of IEEE 802.3 standard Ethernet physics, the potential between an Ethernet line and sending/receiving components is kept separate. The VARAN Manager resends messages to a bus participant immediately when an error occurs. It is principally recommended that the shielding guidelines below be followed.

For applications in which the bus line is run outside the control cabinet, correct shielding is required. This is especially important, if due to physical requirements, the bus lines must be placed next to sources of strong electromagnetic noise. It is recommended that whenever possible, to avoid wiring VARAN-Bus lines parallel to power cables.

SIGMATEK recommends the use of **CAT5e** industrial Ethernet bus lines.

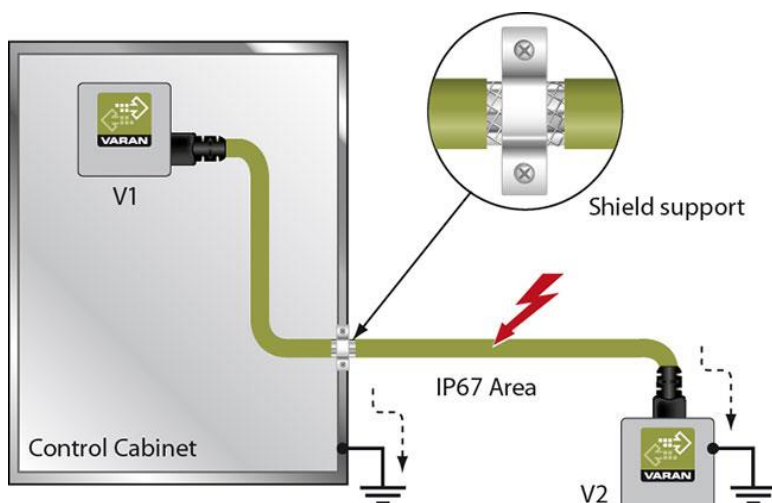
For the shielding variants, an **S-FTP bus line** is recommended, which is a symmetric, multi-wire cable with unshielded pairs. For the total shielding, a combination of foil and braiding is used; it is recommended that an unvarnished variant be used.

The VARAN cable must be secured at a distance of 20 cm from the connector for protection against vibration!

Le câble VARAN doit être protégé contre les vibrations à moins de 20 cm du connecteur (par exemple à l'aide d'une pince)!

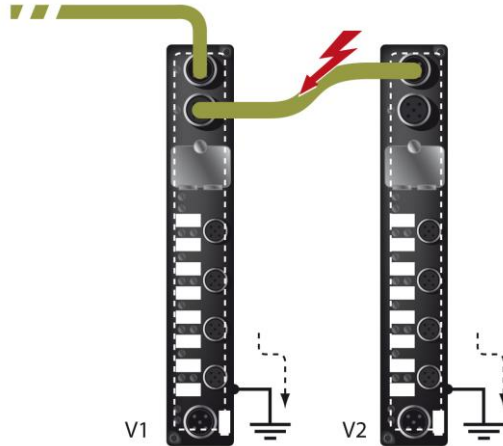
1. Wiring from the Control Cabinet to an External VARAN Component

If the Ethernet lines are connected from a VARAN component to a VARAN node outside the control cabinet, the shielding should be placed at the entry point to the control cabinet housing. All noise can then be deflected from the electronic components before reaching the module.



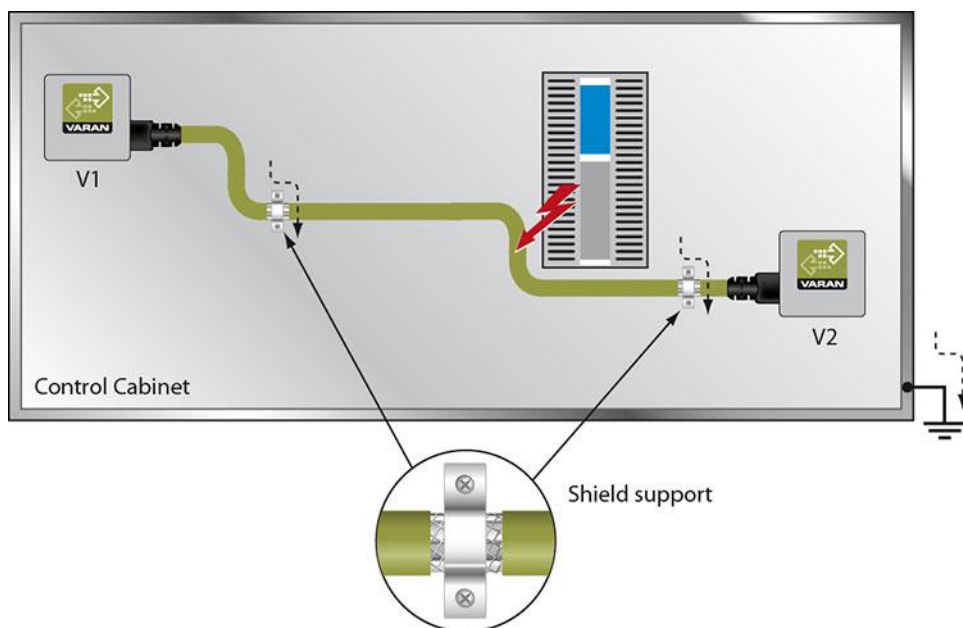
2. Wiring Outside of the Control Cabinet

If a VARAN bus cable must be placed outside of the control cabinet only, no additional shield connection is required. This requires that only IP67 modules and connectors be used. These components are very robust and noise resistant. The shielding for all sockets in IP67 modules are internally connected to common bus or electrically connected to the housing, whereby the deflection of voltage spikes does not flow through the electronics.



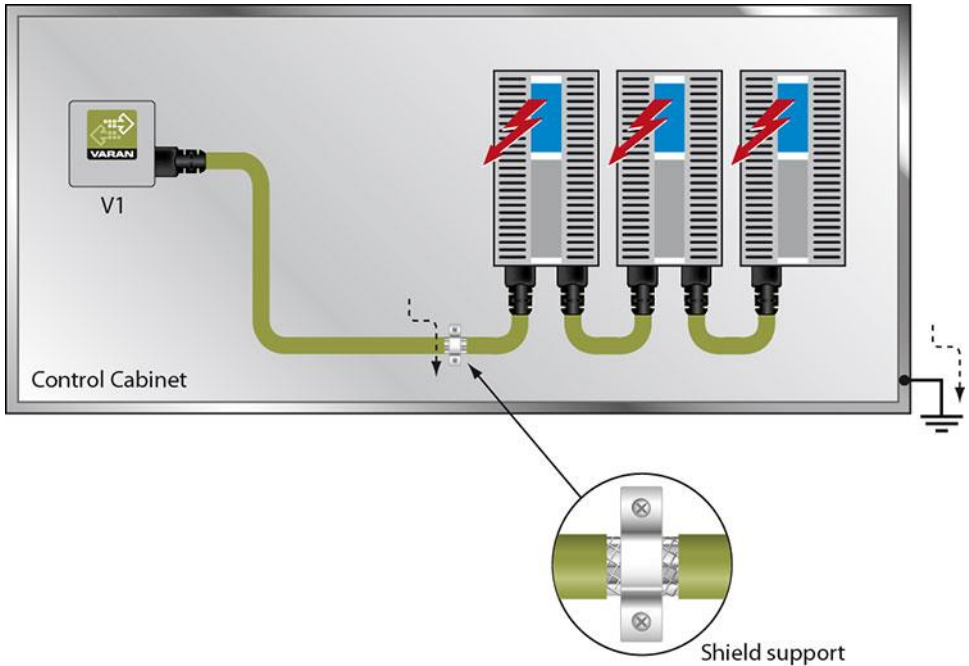
3. Shielding for Wiring Within the Control Cabinet

Sources of strong electromagnetic noise located within the control cabinet (drives, Transformers, etc.) can induce interference in a VARAN bus line. Spike voltages are deflected over the metallic housing of a RJ45 connector. Noise is conducted through the control cabinet housing without further action from the electronic components. To eliminate sources of noise during data transfer, it is recommended that the shielding from all electronic components be connected within the control cabinet.



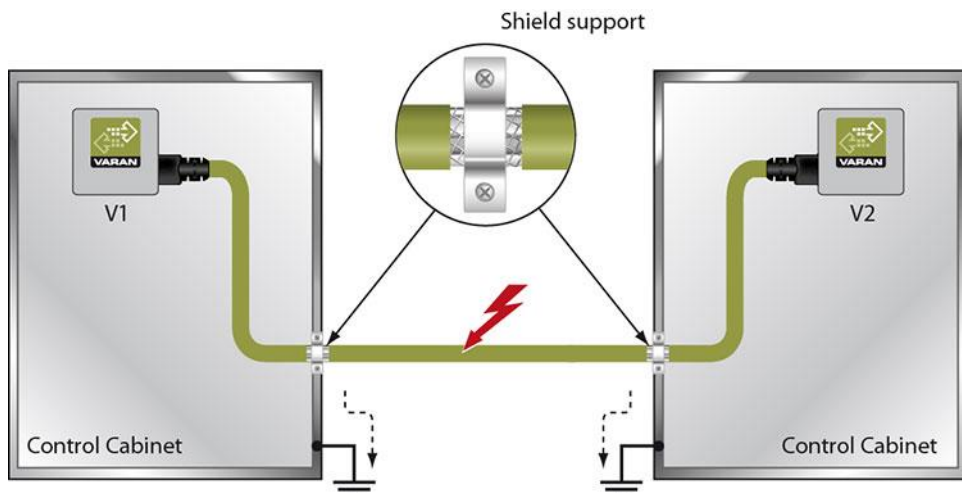
4. Connecting Noise-Generating Components

With the connection of power components that generate strong electromagnetic noise, it is also critical to ensure correct shielding. The shielding should be placed before a power component (or a group thereof).



5. Shielding Between Two Control Cabinets

If two control cabinets must be connected over a VARAN bus, it is recommended that the shielding be located at the entry points to both cabinets. Noise can thereby be kept from reaching the electronics within the control cabinet.



Cleaning the Touch Screen

CAUTION!

Before cleaning the touch screen, the terminal must first be turned off to avoid unintentionally triggering commands or functions!

ATTENTION!

Avant de nettoyer l'écran tactile, le terminal doit d'abord être éteint afin d'éviter un déclenchement involontaire des commandes!

The terminal's touch screen can only be cleaned with a soft, damp cloth. To dampen the cloth, a screen cleaning solution such as anti static foam, water with a mild detergent or alcohol should be used. The cleaning solution should be sprayed onto the cloth and not directly on the terminal. The cleaning solution should not be allowed to reach the terminal electronics, for example, through the ventilation slots.

No erosive cleaning solutions, chemicals, abrasive cleansers or hard objects that can scratch or damage the touch screen may be used.

If the terminal comes in contact with toxic or erosive chemicals, carefully clean the terminal immediately to prevent acid damage.

To ensure the optimal function of the terminal, the terminal should be cleaned regularly!

To extend the lifespan of the touch screen as much as possible, using the fingers to operate the terminal is recommended.

Pour garantir le fonctionnement optimal du terminal, le terminal doit être nettoyé régulièrement!

Pour prolonger la durée de vie de l'écran tactile on recommande d'utiliser les doigts pour l'opérer.