

Fire Alarm System

Salwico CS3000

Service manual

Ver. 6



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Edition 5, 09 1 E, August 2009.

Document no. S-4-007.875

Part no: 070073

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About this manual

This manual is intended to be used by personnel who maintain and perform service on the CS3000 system.

Chapter Control Unit gives a general description on how the Control unit works.

Chapter The Circuit Board of the Control Unit describes the functions of the Control unit's circuit board.

For information regarding the Central unit's various circuit boards refer to The Circuit Boards of the Central Unit chapter.

DIP switch settings for all different parts of the CS3000 system are listed in the DIP Switch Settings appendix.

The fault codes for CS3000 version 4 and 6 are listed in the Fault Codes CS3000 Version 4 and Fault Codes CS3000 Version 6 appendixes respectively.

For a more detailed description of the system refer to the *CS3000 Reference Manual*.

Chapter 1: Control unit

Service mode

The control unit includes a fourth access level to be used only by the service engineer. There are two functions in the service mode: bypass the built-in short circuit isolators and definition of control unit address.

Set address

(Access level 4)

Each control unit in the system must have a unique address in the interval 217 - 232. The control unit number must correspond with the number defined in the Definition program. The control unit address must be set after the system definition is downloaded and the system is restarted.

- Press F4 (MENU) until SERVICE is displayed on line 4.
- Press F1 (SERVICE).
- Press F1 (ADDRESS).
- Enter the address for the control unit. The address interval is 217 - 232.

Bypass built-in short circuit isolators

The built-in short circuit isolators, two on each loop, are bypassed when you activate the SERVICE function. The short circuit isolators remain bypassed until you activate them again.

- Press F4 (MENU) until SERVICE is displayed on line 4.
- Press F1 (SERVICE).

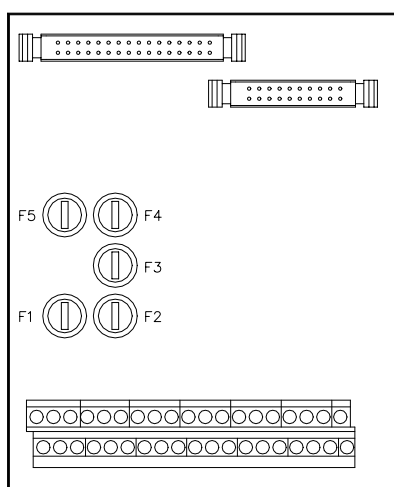
Chapter 2: The circuit board of the control unit

Input/Output board IKK-4

General

The Input/output board (IKK-4) interfaces the control unit processor board to the system loop. The IKK-4 board also includes circuits for transient suppression of all external signals. The IKK-4 board is controlled by the control unit board, via the address and data busses.

Handling

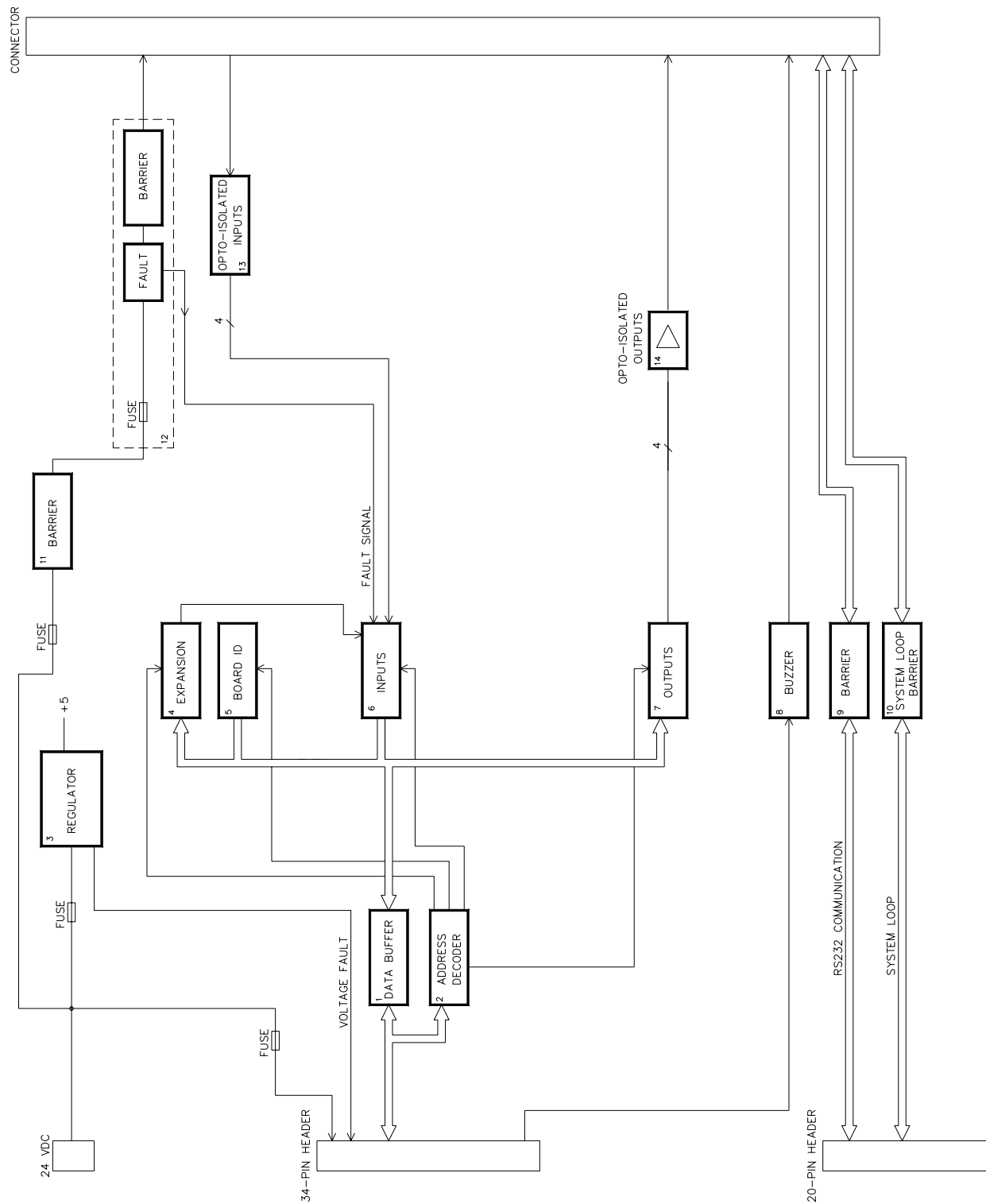


Fuses

Fuse	Fuse rating		Fault code
F1: Control unit panel	500 mAT	5x20 mm	Not supervised
F2: Main fuse	100 mAT	5x20 mm	Not supervised
F3: Main fuse for F4-F5	500 mAT	5x20 mm	Not supervised
F4: Power supply ext. device	315 mAT	5x20 mm	Not supervised
F5: Power supply	315 mAT	5x20 mm	Not supervised

Function

Block diagram



1. Data buffer

The data bus is buffered before entering/leaving the board.

2. Address decoder

The address decoder selects the different blocks. The address decoder is controlled by the control unit board.

3. Regulator

The regulator converts power voltage to 5 VDC.

4. Expansion

Future expansion possibilities. Not used.

5. Board ID

The control unit board reads the IKK-4 ID.

6. Inputs

Reads all external inputs.

7. Outputs

Controls the four transistor outputs.

8. Buzzer

An external buzzer may be connected via a transient protected output. The buzzer will be parallel connected to the fire alarm and the fault buzzer on the control unit board.

9. Barrier

The RS 232 communication is protected against transients before entering the control unit board.

10. System loop barrier

Transient barrier for the system loop.

11. Barrier

The power supply voltage output is protected against external transients.

12. Power supply output

A fused and fault supervised output for power supply to an external device.

13. Opto-isolated inputs

Four opto-isolated transient protected external inputs.

14. Opto-isolated outputs

Four transistor outputs. Deactivated at hang-ups in the programme execution.

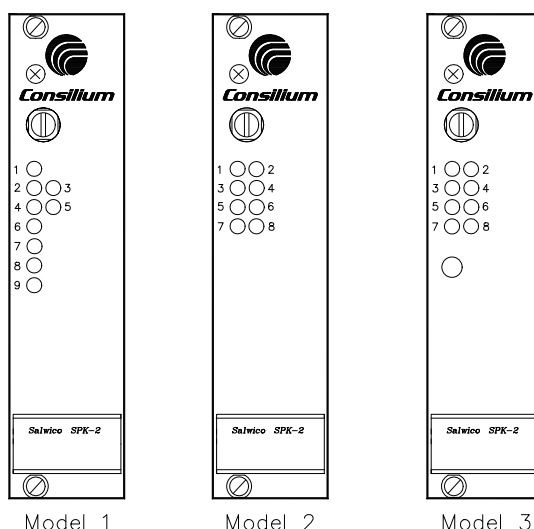
Technical data

Board size:	145 x 107 mm
Ambient temperature:	-10°C - +70°C.
Ambient humidity:	96% Rh.
Input power:	U_{in} : 24 VDC (-20% - + 25%).
Current consumption:	$I_{in\ nom}$: 15 mA $I_{in\ max}$: 40 mA.
Outputs:	4 opto-isolated sourcing outputs
Inputs:	4 opto- isolated inputs, active high

Chapter 3: The circuit boards of the central unit

Loop processor board SPK-2

The loop processor board SPK-2 exists in three different models. Model 1 and model 2 differs only in the exterior of the front panel, whereas Model 3 has an own block diagram.



General

The loop processor board SPK-2 controls and supervises two detector loops with analogue and addressable detectors. The detectors are constantly polled in order to detect faults or changes in alarm status. Detector-initiated alarms are also recognised and verified. The events are reported to the LPK-2 and proper hardware signals are then activated.

Handling

Indications

Model 1	There are nine LEDs on the front panel of the board.
No 1 (green)	when lit: proper voltage supply.
No 2 (yellow)	when lit: fault in loop #1.
No 3 (red)	when lit: fire alarm in loop #1.
No 4 (yellow)	when lit: fault in loop #2.
No 5 (red)	when lit: fire alarm in loop #2.
No 6 (yellow)	when lit: local processor failure
No 7	(in service mode) will flash synchronously with the central unit's communication with the loop-PCB.
No 8, 9	(in service mode) will flash synchronously with polling of the loop-units
Model 2 & 3	There are eight LEDs on the front panel of the board.
No 1 (green)	when lit: proper voltage supply.
No 2 (yellow)	when lit: local processor failure.
No 3, 4 (green)	(in service mode) will flash synchronously with polling of the loop-units
No 5 (yellow)	when lit: fault in loop #1.
No 6 (red)	when lit: fire alarm in loop #1.
No 7 (yellow)	when lit: fault in loop #2.
No 8 (red)	when lit: fire alarm in loop #2.

Fuse

The battery voltage is fused. If the fuse is blown a signal is activated in the back plane. The fuse is accessible on the front panel of the board, and can be used for disconnecting the power.

Fuse ratings:

Model 1 & 2: 1 AT 5x20 mm

Model 3: 1.6 AT 5x20 mm

Setting the address

The address of loop #1 of the board is set with a DIP-switch (SW1), with 8 switches. Bit #1 is set with SW1-1, and bit #8 with SW1-8. The address of loop #2 is automatically set by the system to the next consecutive value.

Set the address of each SPK-2 according to the definition in the Definition program.

Restarting the board

Remove the fuse from the board to disconnect the power. When the fuse is put back on, the board is restarted.

Replacing the board

To replace the SPK-2 follow these steps:

1. Disconnect the power by removing the fuse.



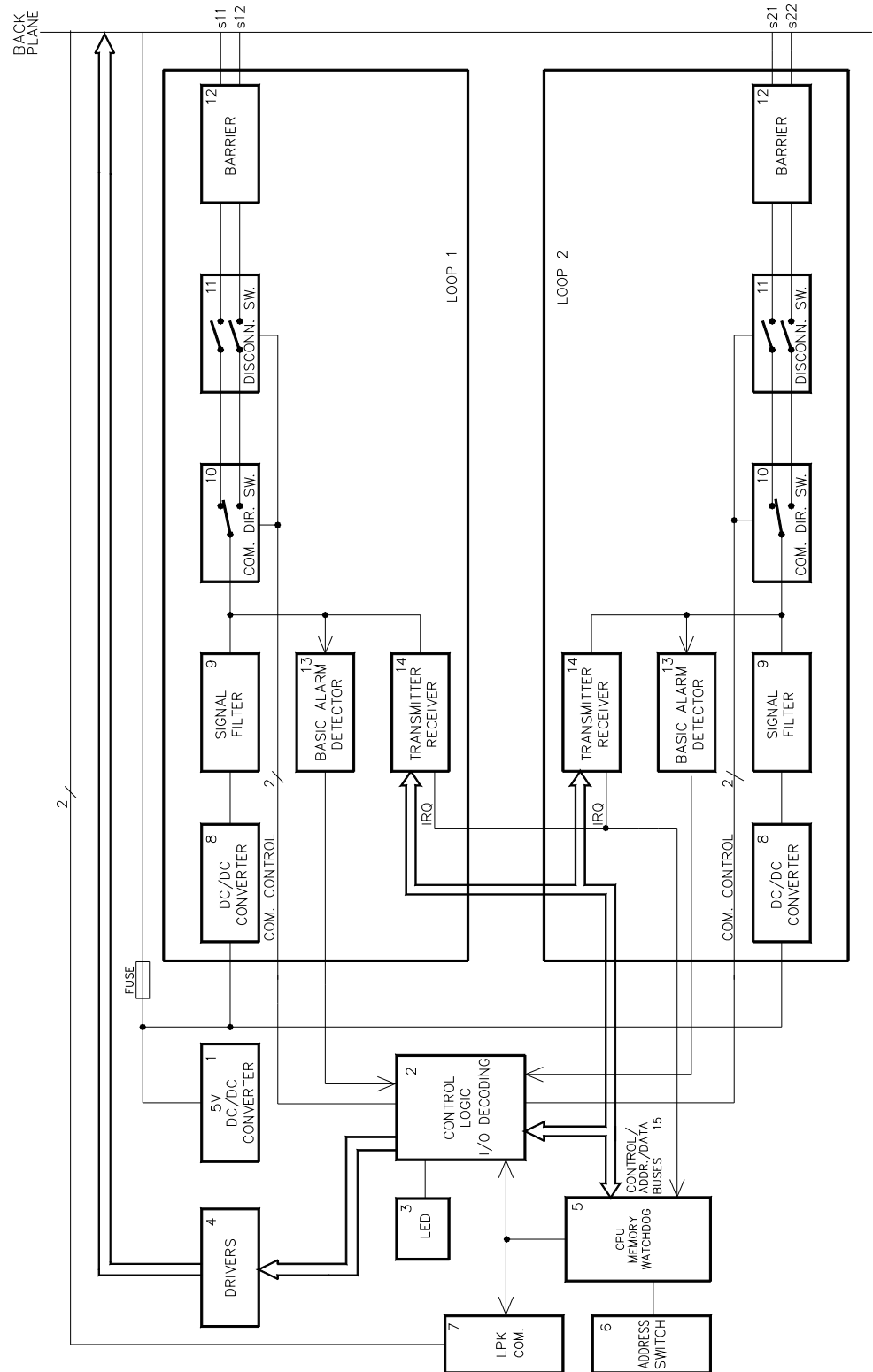
WARNING!

The power must be disconnected before the board is removed.

2. Remove the board and replace it with the new board.

Function**Block diagram****Model 1 & Model 2**

NB! In the diagram blocks 8 - 14 are doubled, one set for each detector loop.



1. Power supply

Power supply for processor, memory and logic of the loop processor board.

2. Control logic

Control logic for activation and blocking of hardware signals to the back plane. LEDs for indication of status and communication are also controlled in this block.

3. LED indications

LEDs for indicating status of fire, fault, communication and voltage.

4. Drivers

Drivers for adapting hardware signal to the back plane.

5. CPU/Memory/watchdog

This is the main block of the SPK-2 board. The CPU controls both of the detector loops and the communication with the LPK-2. The memory circuits contain the programme code, default data for the detectors and status information. The watchdog supervises the processor and checks for hang-ups in the programme execution.

6. Address switch

The 8-bit address of the SPK-2, i.e. the loop number, is set with the DIP switch.

7. LPK communication

Interface for back plane communication.

8. DC/DC converter

The DC/DC-converter converts the battery voltage from the back plane to 30 VDC, for the detector loops.

9. Signal filter

Signal filter for the communication signals.

10. Communication direction switch

For closed loops the choice of direction for the communication is made with this switch.

11. Disconnection switch

With this switch the entire detector loop may be disconnected.

12. Barrier

Barrier for protecting the loops against incoming transients.

13. Basic-Alarm detection

Circuit for the detection of a basic-alarm.

14. Transmitter/receiver

Transmitter, receiver and interface for the processor bus.

15. Buses

The control signal bus contains signals to control the reading and writing of devices connected to the address bus and the data bus.

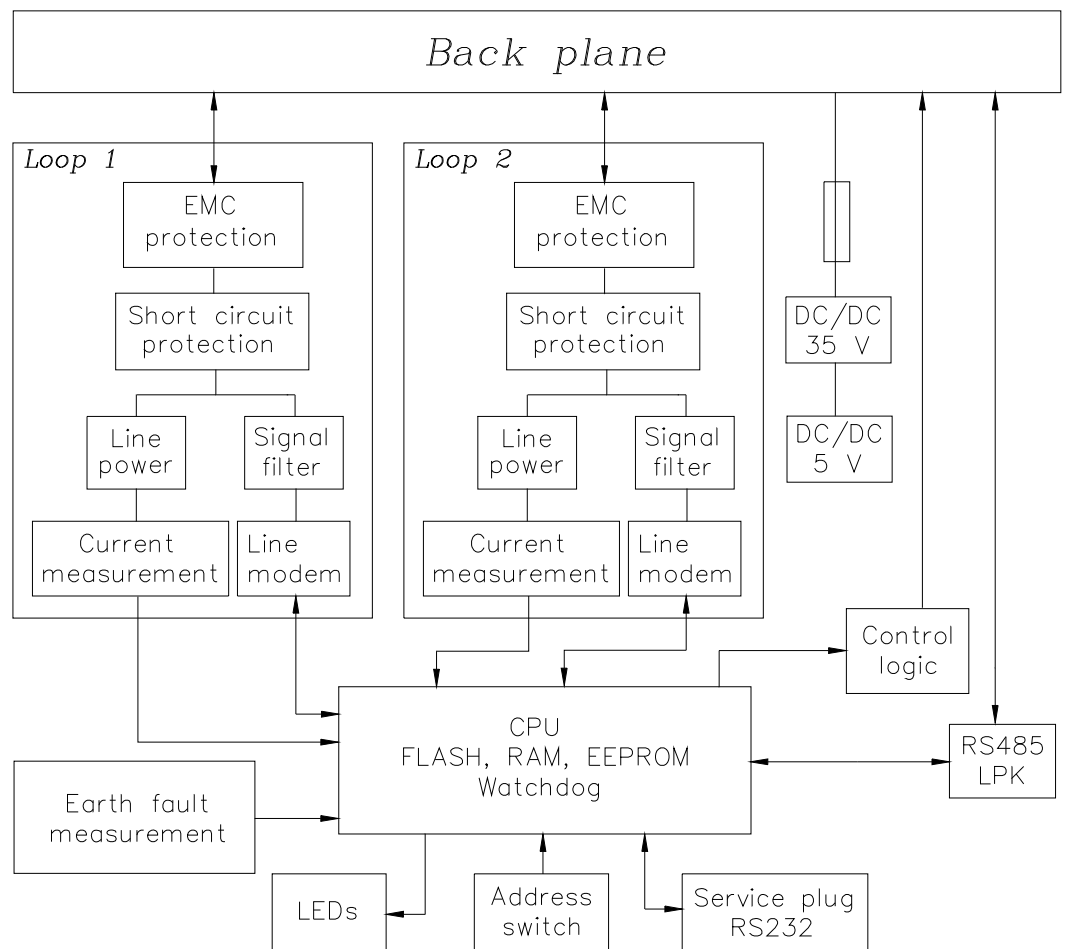
The circuit boards of the central unit

Block diagram

Model 3

SPK-2 Model 3 can be split into three functions: Power supply, loop and processor with memory. The power supply provides the board with loop power and power for the logic and the processors. The loop part contains electronics for two loops and handles power supply for the loop and sending/transmitting of IDA and NOSE messages. The processor controls the loops and communicates with the LPK via the RS485 channel of the back plane.

The whole board is galvanically isolated from the CS3000 rack.



DC/DC converter

Power is taken from the back plane and converted via a galvanically isolated DC/DC converter into 35V. The 35V is used to power feed the loops and is also converted to 5V for the logic. The voltage feed is fused.

Control logic

Signals in the back plane for fuse fault, voltage fault and prim-alarm. All signals are galvanically isolated between SPK-2 and the back plane.

LEDs

Indicating status of the system. Some LEDs are active only in service mode.

CPU, memory and watchdog

The CPU controls and supervises the communication on both loops and also communicates with the LPK. The memory contains program code with initial values for the loop units and also gives status information. The watchdog supervises the CPU and activates a reset signal to the CPU in case of malfunction.

Address switch

An 8-pole DIP-switch deciding the physical address of the board.

RS485 LPK communication

One asynchronous channel of the processor is used for communication with the LPK. These signals are adapted to the RS485 levels and are galvanically separated from the back plane.

Service plug

RS232 channel used for service, debugging and downloading of code.

Earth fault measurement

Measuring positive and negative earth faults. Since the board is galvanically separated from the rest of the system, the measurement is a local indication of earth faults from the loops. Earth fault is not measured when the board is used for connection of GSK.

Loop : EMC protection

Protecting the electronics from various EMC disturbances.

Loop: Short circuit protection

Contains two parts, one part automatically disconnecting the loop power when the current consumption exceeds allowed limit and one part which is used to control the power feed to the primary and/or secondary side of the loop.

Loop: Line power

Feeding the loop with correct DC voltage and current and adapting the loop to the signalling used on IDA and NOSE loops.

Loop: Current measurement

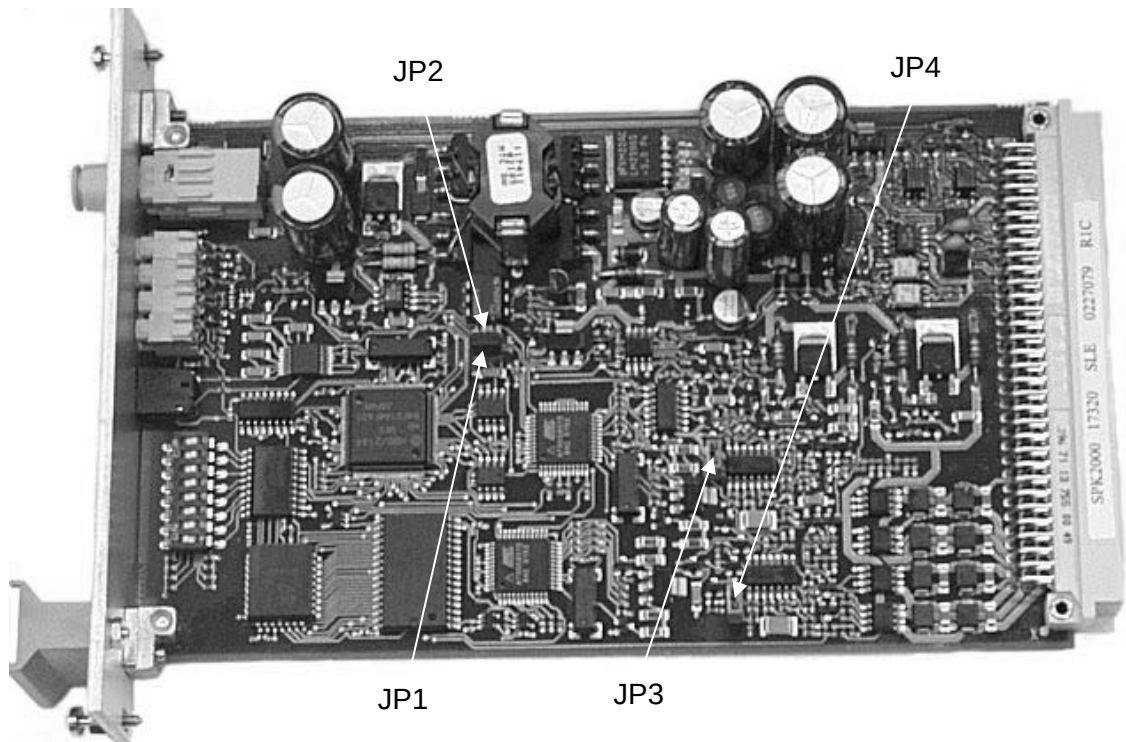
Measuring the DC current which is fed to the loop.

Loop: Signal filter

Separating and filtering out IDA/NOSE communication from the DC supply voltage on the loop.

Loop: Line modem

Sending and receiving IDA/NOSE communication. Communication with the processor via serial channel.

Jumpers**Model 3**

JP1 Must always be strapped in normal operation. The strap enables the watchdog.

JP2 Never strapped during normal operation.

JP1 and JP2 are only strapped differently during production when the card is programmed the first time.

JP3 Normally strapped.

JP4 Normally strapped.

JP3 and JP4 can be used to enhance reception of loop communication in case of loops with communication problems.

Technical data**Model 1 & 2**

Board size: Single Europe board, 100 x 160 mm
Front panel: Anodised aluminium, width 6 TE(30.1 mm)

Ambient temperature: -10°C to +70°C

Ambient humidity: 96% Rh

Input power: U_{in} : 24 VDC (-20% - + 25%)

Current consumption: $I_{in\ nom}$: 90 mA
 $I_{in\ max}$: 160 mA

Output voltage: U_{ut} : 30 VDC (+/- 5%)

Output current: $I_{ut\ nom}$: 45 mA
 $I_{ut\ max}$: 125 mA

Model 3

Board size: Single Europe board, 100 x 160 mm
Front panel: Anodised aluminium, width 6 TE(30.1 mm)

Ambient temperature: -10°C to +70°C

Ambient humidity: 96% Rh

Input power: U_{in} : 24 VDC (-20% - + 25%)

Current consumption: $I_{in\ nom}$: 120 mA (no loop units connected)
 $I_{in\ max}$: 1300 mA

Output voltage: U_{ut} : 32 - 34 VDC

Output current: $I_{ut\ max}$: 300 mA/loop

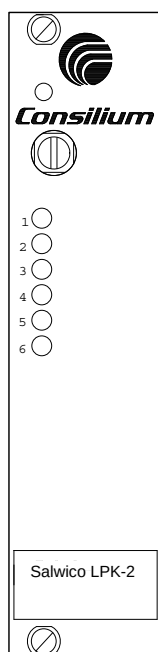
Alarm processor board LPK-2

General

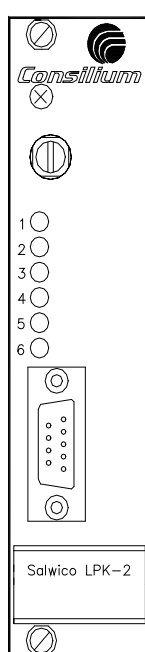
The alarm processor board LPK-2 controls and supervises the external alarm devices. The board also controls external functions such as fans, fire doors and release of fire extinguishing agents through relay outputs. The LPK-2 also monitors all communication within its own central with all loop processor boards. The LPK-2 that is situated in the main central unit also monitors all communication on the system loop with control units and with external computers, printers, etc.

The alarm processor board exists in two different models, which differ only in the exterior of the front panel. Model 2 has an additional connector for downloading data from a computer.

Handling



Model 1



Model 2

Indications

There are six LEDs on the front panel of the board.

No 1 (green)	when lit:	proper voltage supply.
No 2 (red)	when lit:	fire alarm has been given on the fire brigade relay output.
No 3 (yellow)	when lit:	fault has been detected.
No 4 (yellow)	when lit:	local system failure
No 5 (green)	(in service mode)	will flash synchronously with the central unit's communication with the loop-PCB.
No 6 (green)	(in service mode)	will flash synchronously with the communication on the system loop.

Fuse

The battery voltage is fused. If the fuse is blown a signal is activated in the back plane. The fuse is accessible on the front panel of the board, and can be used for disconnecting the power.

Fuse rating: 1 A 5x20 mm

Setting the address

The address of the board is set with a DIP-switch (SW1), with 8 switches.

- Sw 6 (when set) activates the service mode.
- Sw 7 (when set) allows communication only on loop 1 (the primary loop).
- Sw 8 (when set) allows communication only on loop 2 (the secondary loop).
- Sw 6, 7, 8 (when set together) forces downloading of definition data.

The address interval is 1 - 16. The LPK-2 board controlling and supervising the main central unit is always set to one. The addresses of the other LPK-2, if installed in the system, are set according to the definition in the Definition program.

Restarting the board

Remove the fuse from the board to disconnect the power. When the fuse is put back on, the board is restarted.

Replacing the board

To replace the LPK-2 follow these steps:

1. Disconnect the power by removing the fuse.
2. To avoid activation of Bells, remove fuses F5-F10 on ARK-2.

**WARNING!**

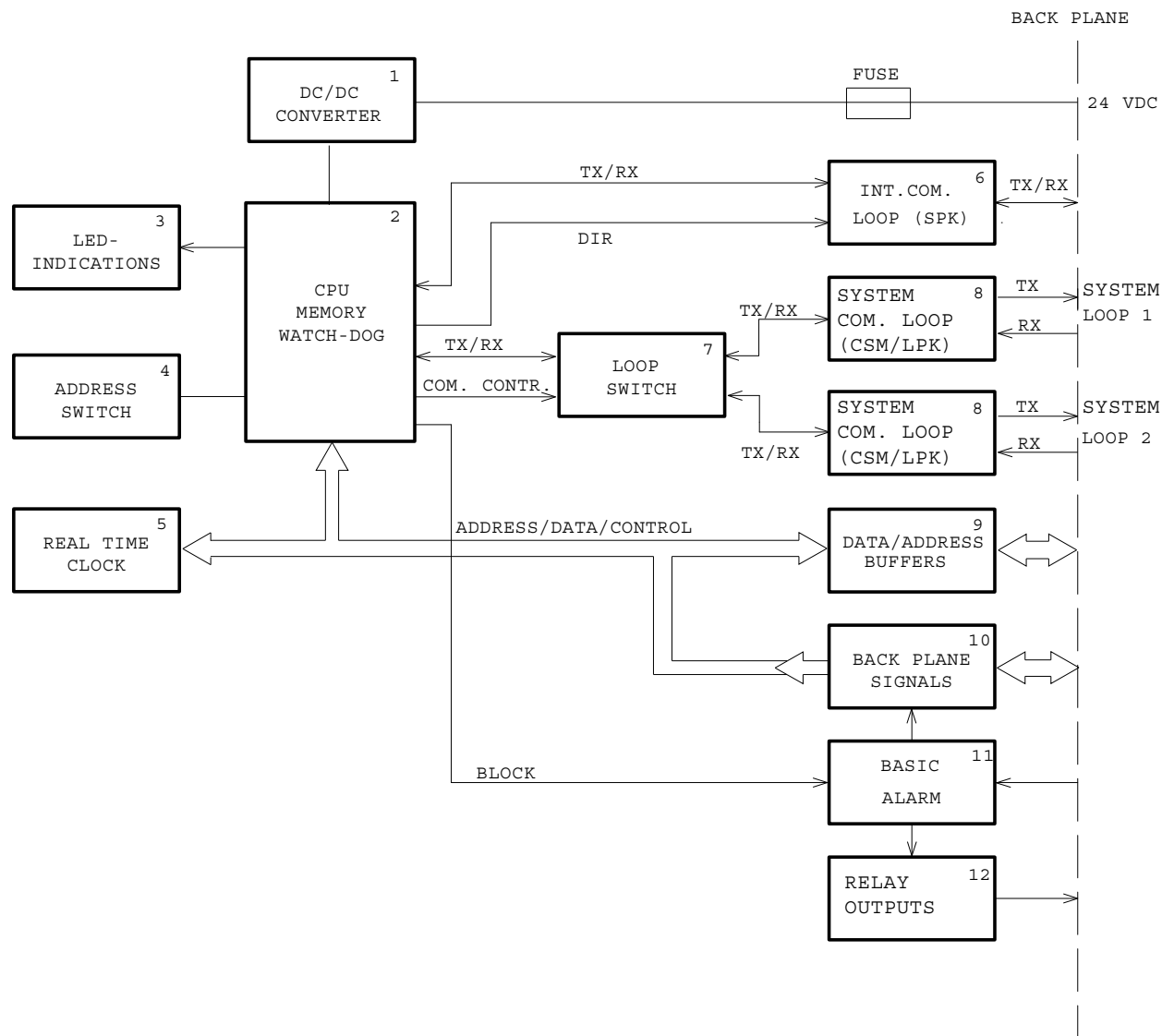
The power must be disconnected before the board is removed.

3. Remove the board and replace it with the new board.

The circuit boards of the central unit

Function

Block diagram



1. DC/DC converter

The DC/DC circuit converts the battery voltage of the back plane to 5 VDC, which is supplied to all logical circuits on the board.

2. CPU/Memory/Watchdog

This is the main block of the LPK-board. The CPU uses the memory circuits for executing the programme code. There is also a non-erasable memory containing the system configuration and the external controls. The watchdog supervises the processor and checks that there are no hang-ups in the programme execution.

3. LED indications

One green LED indicates that the board is power supplied. If the watchdog is activated (possible fault in the board), a yellow LED is lit, indicating system fault. Furthermore there are two LEDs (one yellow and one red) indicating fault and alarm in the central unit. Finally there are two green LEDs that are used for service purposes.

4. Address switch

With the DIP switch the 8-bit address of the LPK is set.

5. Real time clock

The real time clock is keeping track of the time in the system. The clock has built-in registers for seconds, minutes, hours, days, week-day, month and year (including leap-years). The real time clock is reset from the control panel.

6. Internal communication loop (RS485)

The internal communication loop is connected to all SPKs in the same rack system. All SPKs are polled and supervised via this loop.

7. Loop switch

The loop switch changes the communication channel from one external loop to the other.

8. System communication loop (RS422)

This block contains the communication with control units and other central units.

9. Data/address buffers

All bus connections going from the back plane are buffered in special buffer circuits.

10. Back plane signals

Certain hardware signals in the back plane are read by the LPK after a voltage conversion.

11. Basic-alarm

The basic-alarm function is activated if a SPK or the LPK is faulty and therefore incapable of transmitting an alarm. This board will block the basic-alarm function if the processor is in proper working order.

12. Fire brigade output

Two relay outputs for connection to the fire brigade. The alarm relay is programmable and the other relay is activated when there are not muted faults in the system.

Technical data

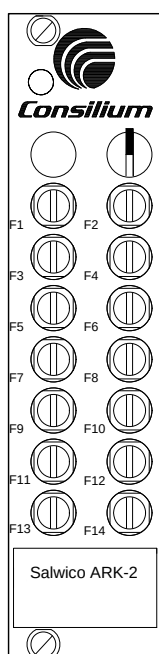
Board size:	Single Europe board, 100 x 160 mm.
Front panel:	Anodised aluminium, width 6 TE (30.1 mm).
Ambient temperature:	-10°C to +70°C.
Ambient humidity:	96% Rh.
Input power:	U_{in} : 24 VDC (-20% - + 25%).
Current consumption:	$I_{in\ nom}$: 80 mA $I_{in\ max}$: 120 mA.
Outputs:	2 relays, 480 mA, 125 V

Relay board ARK-2

General

Orders to the alarm devices and controls issued by the LPK is executed by the relay board. The alarm device outputs can also be activated by a basic-alarm via the back plane. Furthermore the relay board may be used for monitoring external signals and for supervision of power supply to external units.

Handling



Indications

The LED on the front panel of the board is lit every time the board is polled.

Fuses

There are 14 fuses on the front panel..

F1	Output 24 VDC 1+	F2	Output 24 VDC 1-
F3	Output 24 VDC 2+	F4	Output 24 VDC 2-
F5	Alarm bell output 1+	F6	Alarm bell output 1-
F7	Alarm bell output 2+	F8	Alarm bell output 2-
F9	Alarm bell output 3+	F10	Alarm bell output 3-
F11	Relay output RL1	F12	Relay output RL2
F13	Relay output RL3	F14	GA-output

Fuse rating: 2 AT 5x20 mm

Jumper "PLUS"

With this jumper the pulse type can be altered. In the left position the pulse is internally generated, in the right position the pulse comes from an external source.

Switch S9

This switch is found on the front panel and is used for resetting the basic-alarm.

Switch SW1

SW1-1, SW1-2, SW1-3 (B1, B2, B3)

"ON" : Steady signal to corresponding alarm bell output.

"OFF": Pulsed signal to corresponding alarm bell output.

SW1-4, SW1-5, SW1-6 (R1, R2, R3)

"ON" : Steady signal to the outputs of relays RL1-RL3.

"OFF": Pulsed signal to the outputs of relays RL1-RL3.

SW1-7 (GA)

"ON" : Signal in step with the signal on the GA-input.

"OFF": Pulsing signal

Replacing the board

To replace the ARK-2 follow these steps:

1. Shut down the central by removing the fuses F3-F6 on the KE-2 rectifier.



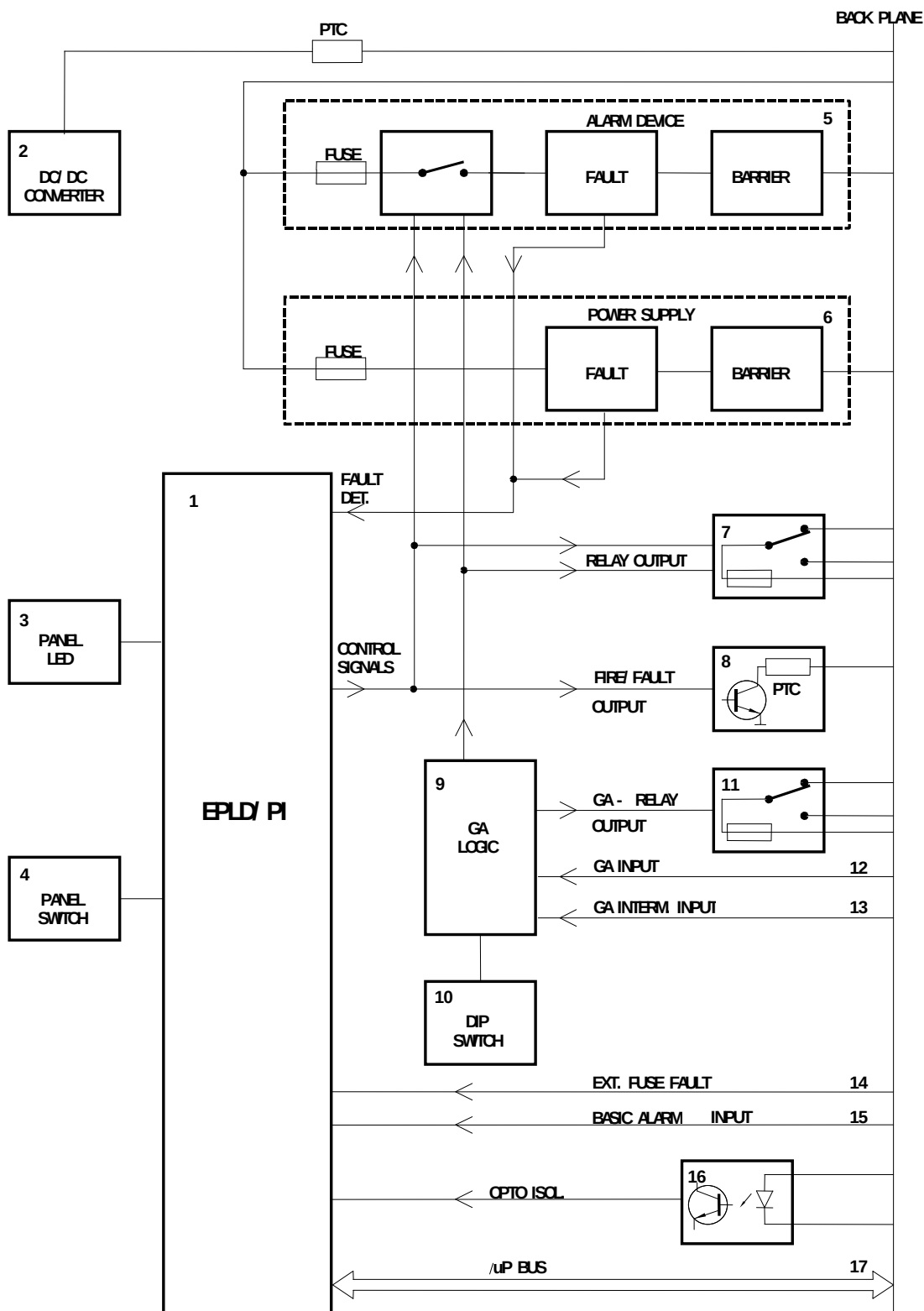
WARNING!

The power must be disconnected before the board is removed.

2. Remove the board and replace it with the new board.
3. Start up the central by inserting F3+F4 and F5+F6 in that order.

Function

Block diagram



1. EPLD/PIO

The EPLD/PIO includes I/O-circuit to the microprocessor and a programmable circuit for all output, input and supervising functions on the board.

2. DC/DC-converter

The DC/DC-circuit converts the battery voltage of the back plane to 5 VDC, which is fed to circuits on the board.

3. Panel-LED

The panel-LED is flashing when the board is being polled by the LPK.

4. Panel-switch

The panel-switch is used for manually resetting the alarm devices after a basic-alarm.

5. Alarm device output

Three programmable, fused and fault-supervised alarm device outputs.

6. Power supply output

Two fused and fault supervised outputs for power supply to external devices.

7. Relay output

Three programmable, fused and potential free relay outputs.

8. Fire/fault output

One current-sinking programmable output for FIRE and one for FAULT.

9. GA-logic

The GA-logic controls the GA-output and the alarm device outputs depending on the GA-input and pulsed output selection.

10. DIP-switch

The DIP-switch is used for setting a continuous/intermittent function of the outputs 5 and 7 above.

11. GA-relay output

One fused and potential free relay output, which follows the GA-input.

12. GA-input

Input for connection of GA push button.

13. GA intermittent signal output

Input for connection of external intermittent signal for the GA.

14. External fuse fault input

Input for indication of fuse fault in external devices.

15. BASIC-ALARM input**16. Opto-isolated inputs**

Four opto-isolated inputs for external signals.

17. Micro processor bus

Connection of micro processor bus to the LPK.

Technical data

Board size:	Two joined single Europe board, 100 x 160 mm.
Front panel:	Anodised aluminium, width 6 TE (30.1 mm).
Ambient temperature:	-10° to +70°C.
Ambient humidity:	96% Rh.
Input power:	U_{in} : 24 VDC (-20% - + 25%).
Current consumption:	$I_{in\ nom.}$: 30 mA $I_{in\ max.}$: 80 mA.

Inputs

Four opto isolated with common +

Input voltage: $U_{in\ max.}$: 35 VDC

Input current I_{in} : 8 mA at $U_{in} = 24\ V$

One DG, 2880 ohm relay coil for 24 VDC, activated when low

Input voltage: $U_{in\ max.}$: 35 VDC

Activation of relay: $U_{act\ max.}$: 7.2 VDC

One external intermittence, 10 kohm pull-up to +24 V, activated when low

Input voltage: $U_{in\ max.}$: 35 VDC

One external fuse fault, 10 kohm pull-up to +24 V, activated when low

Input voltage: $U_{in\ max.}$: 35 VDC

Outputs

Two power outputs, 24 VDC, $I_{max.}$: 2 A

Three fault supervised, programmable alarm outputs, 35 VAC, $I_{max.}$: 2 A

Three change-over, programmable relay outputs, 35 VAC, $I_{max.}$: 2 A

One change-over relay output for GA, $I_{max.}$: 2 A

Two open-collector outputs, PTC-protected, one programmable and one activated at not muted fault in the central unit, $U_{max.}$: 24 V, $I_{sink\ max.}$: 100 mA

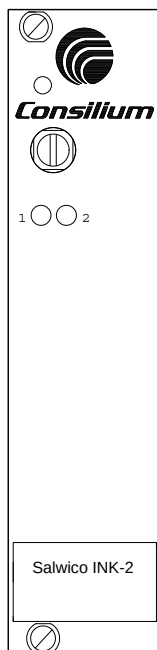
Input board INK-2

General

The input board INK-2 is used for getting information about external activities, which can be used, for example, to control other outputs. The INK-2 board is controlled by the alarm processor board LPK-2, via the address and data buses in the back plane. The board also contains a status register for functional checks.

The INK-2 board is equipped with 24 opto-isolated inputs for 24 VDC/10 mA. These inputs are divided into six groups, each with four inputs with a common return conductor.

Handling



Indications

There are two LEDs on the front panel of the board.

No 1 (green) when lit: proper voltage supply.

No 2 (green) when lit: the board is properly polled.

Fuse

The battery voltage is fused. If the fuse is blown a signal is activated in the back plane. The fuse is accessible on the front panel of the board, and can be used for disconnecting the power.

Fuse rating: 250 mA T 5x20 mm

Setting the address

The address of the board is set with a DIP-switch (SW1), with 8 switches. The address bits #2 - #9 are set. Bit #2 is set with SW1-1, and bit #9 with SW1-8. For more information see Appendix A.

Restarting the board

Remove the fuse from the board to disconnect the power. When the fuse is put back on, the board is restarted.

Replacing the board

To replace INK-2 follow these steps:

1. Shut down the central by removing the fuses F3-F6 on the KE-2 rectifier.



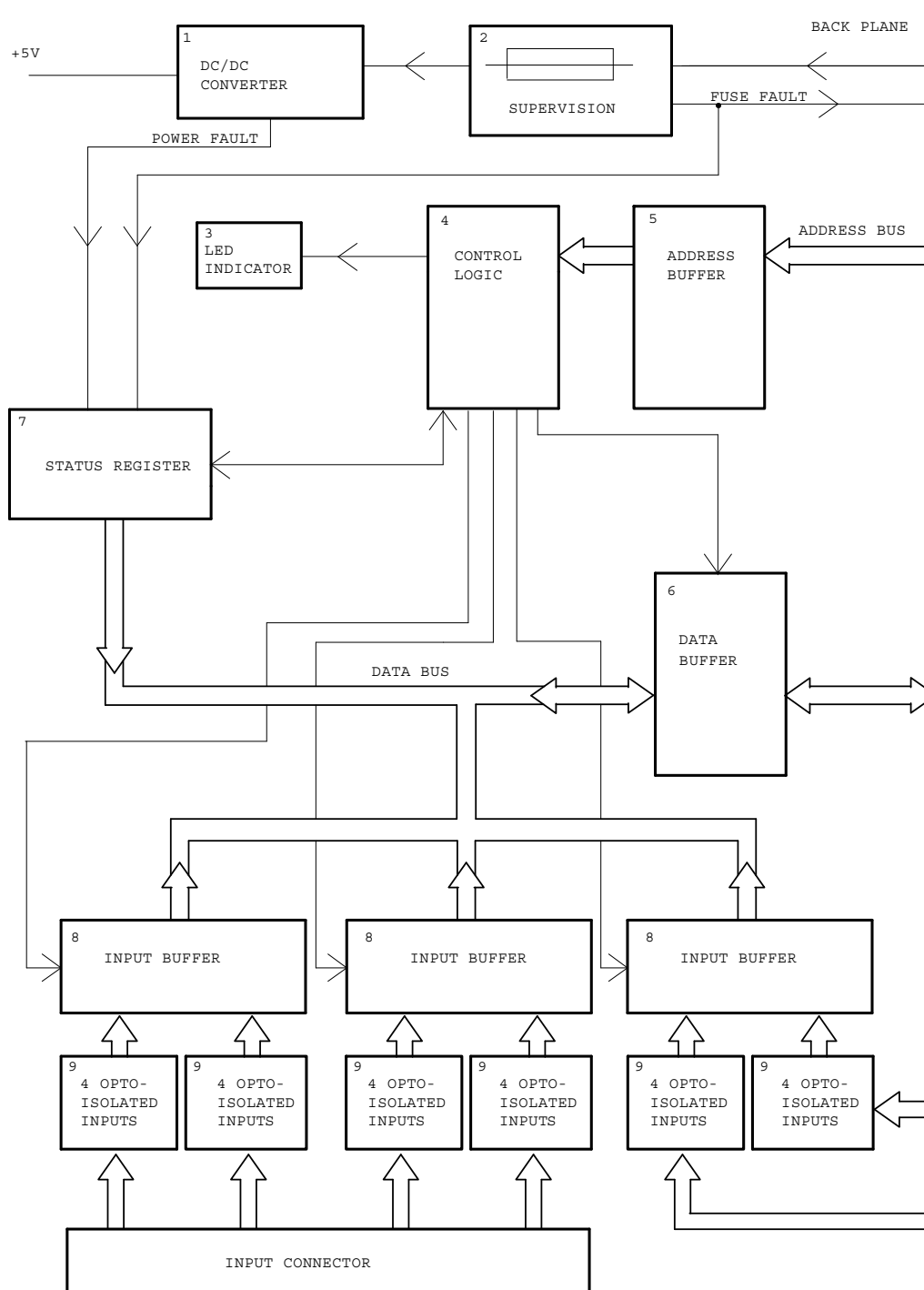
WARNING!

The power must be disconnected before the board is removed.

2. Remove the board and replace it with the new board.
3. Start up the central by inserting F3+F4 and F5+F6 in that order.

Function

Block diagram



1. DC/DC converter

The DC/DC circuit converts the battery voltage of the back plane to 5 VDC, which is supplied to all logical circuits on the board. Should the voltage disappear, a signal is activated in the back plane.

2. Supervision

The battery voltage is fused. If the fuse is blown a signal is activated in the back plane. The fuse is accessible on the front panel of the board, and can be used for disconnecting the power.

3. LED indications

On the front panel are two green LEDs for indicating 5V power and normal polling.

4. Control logic

The control logic is used for decoding the address bus and for generating signals to read/write the status register and read the input buffers.

5. & 6. Buffers

The address bus, the data bus and the control signals are buffered before entering the board.

7. Status register

The status register is a read/write register. On reset the status is zeroed. Thus it is possible to check the function of the board.

8. Input buffers

The signals on the inputs are buffered before entering the data bus.

9. Opto-isolated inputs

The inputs are divided into six groups, where each group has a common return conductor. The inputs are protected by transient suppressors. Each input is equipped with an LED that is lit when the input is active. These LEDs are not visible from the front panel.

Technical data

Board size:	Single Europe board, 100 x 160 mm.
Front panel:	Anodised aluminium, width 6 TE (30.1 mm).
Ambient temperature:	-10°C - +70°C.
Ambient humidity:	96% Rh.
Input power:	U_{in} : 24 VDC (-20% - + 25%).
Current consumption:	$I_{in\ nom}$: 15 mA $I_{in\ max}$: 40 mA.

Inputs

24 opto isolated, transient protected in six groups with common return conductor.

Input voltage:	$U_{in\ max}$: 35 VDC.
Input current:	I_{in} : 10 mA at $U_{in} = 24\ V$.
Activated input:	$I_{in\ min}$: 1.3 mA
Deactivated input:	$I_{in\ max}$: 0.1 mA

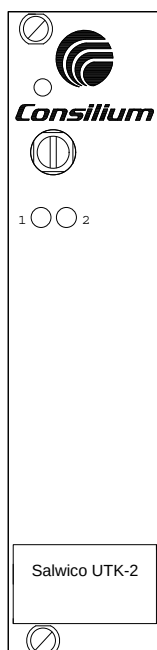
Output board UTK-2

General

The output board UTK-2 is used for controlling external relays, e.g. for fans and fire doors. The UTK-2 board is controlled by the alarm processor board LPK-2, via the address and data buses in the back plane.

The UTK-2 board is equipped with 24 opto-isolated outputs for 24 VDC/50 mA. The outputs are divided into six groups where each group includes four outputs and a common positive conductor.

Handling



Indications

In the front panel of the board are two LEDs.

No 1 (green) when lit: proper voltage supply.

No 2 (green) when lit: the board is properly polled.

Fuse

The battery voltage is fused. If the fuse is blown a signal is activated in the back-plane. The fuse is accessible on the front panel of the board, and can be used for disconnecting the power.

Fuse rating: 250 mA T 5x20 mm

Setting the address

The address of the board is set with a DIP-switch (SW1), with 8 switches. The address bits #2 - #9 are set. Bit #2 is set with SW1-1, and bit #9 with SW1-8. For more information see Appendix A.

Restarting the board

Remove the fuse from the board to disconnect the power. When the fuse is put back on, the board is restarted.

Replacing the board

To replace the UTK-2 follow these steps:

1. Shut down the central by removing the fuses F3-F6 on the KE-2 rectifier.



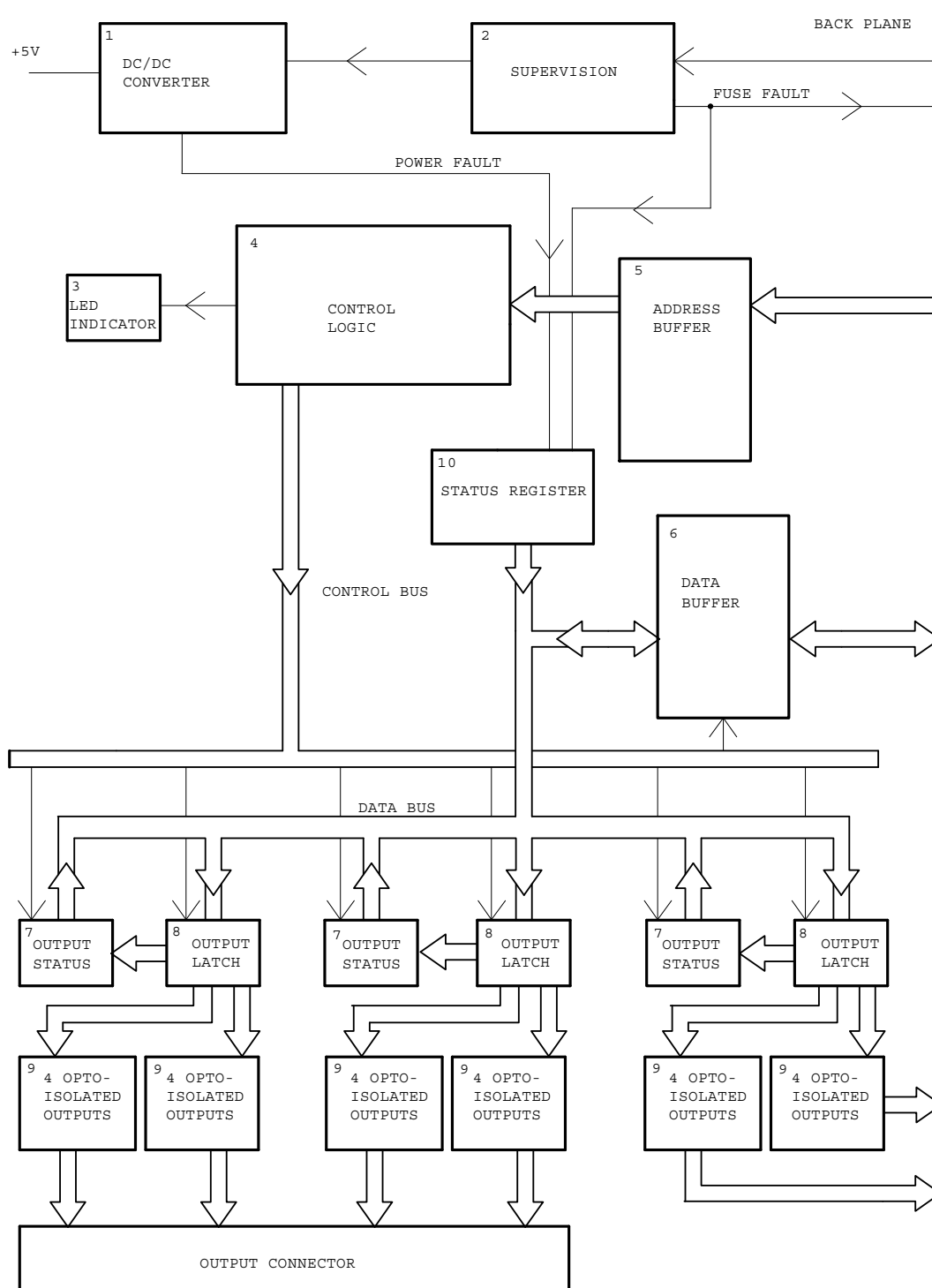
WARNING!

The power must be disconnected before the board is removed.

2. Remove the board and replace it with the new board.
3. Start up the central by inserting F3+F4 and F5+F6 in that order.

Function

Block diagram



1. DC/DC converter

The DC/DC circuit converts the battery voltage of the back plane to 5 VDC, which is supplied to all logical circuits on the board. Should the voltage disappear, a signal is activated in the back-plane.

2. Supervision

The battery voltage is fused. If the fuse is blown a signal is activated in the back-plane. The fuse is accessible on the front panel of the board, and can be used for disconnecting the power.

3. LED indications

On the front panel are two green LEDs for indicating 5V power and normal polling.

4. Control logic

The control logic is used for decoding the address bus and for generating selection signals for read buffers and output buffers.

5. & 6. Buffers

The address bus, the data bus and the control signals are buffered before entering the board.

7. Output status

The value written to the outputs can be read, to check the function of the board.

8. Output latch

The output latches also functions as drive circuits for the opto switches.

9. Opto-isolated outputs

The outputs are divided into six groups, where each group has a common positive conductor. The load is connected between the output and ground. Each output is protected by a varistor and a freewheel diode for inductive loads.

Technical data

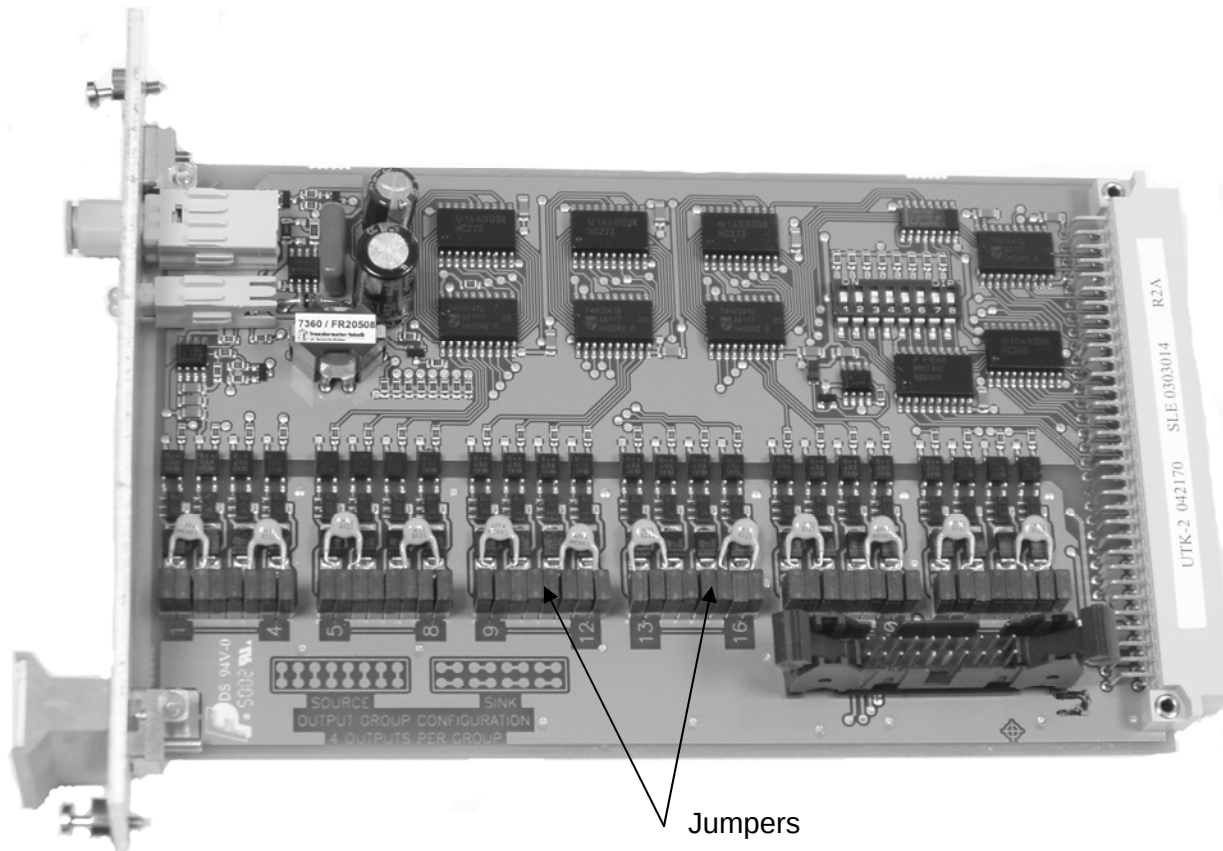
Board size:	Single Europe board, 100x160 mm
Front panel:	Anodised aluminium, width 6 TE (30.1 mm)

Ambient temperature:	-10°C - +70°C
Ambient humidity:	96% Rh
Input power:	U_{in} : 24 VDC (-20% - + 25%)
Current consumption:	$I_{in\ nom}$: 15 mA
	$I_{in\ max}$: 55 mA

Outputs

24 opto isolated, transient protected in six groups with common positive conductor

Output voltage:	$U_{out\ max}$: 35 VDC
Output current:	$I_{out\ max}$: 50 mA
Voltage drop:	U_{max} : 1.2 VDC @ 50 mA
Leakage current:	$I_{out\ max}$: 3 mA @ 70 C



Choice of source/sink outputs

Each of the 24 outputs can be individually chosen for source or sink outputs by means of the jumpers on the PCB (see picture above). The outputs on the PCB are grouped, with four outputs in each group. Each output has two jumpers (i.e. eight jumpers per group).

The jumpers are factory set (as in the picture) for source output on all lines.



SOURCE

SINK

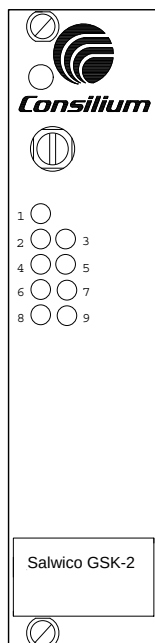
Output group configuration. 4 outputs per group

Interface board GSK-2

General

The interface board GSK-2 is used for connecting detector sections containing conventional digital detectors. With this board it is possible to connect the detectors from a C300 system to the CS3000 system. These detectors will however not be addressable. To each GSK-2 board a maximum of four detector sections may be connected. The detector sections are supervised for cable breaks and it is also possible to disconnect smoke detectors on these sections.

Handling



Indications

There are nine LEDs on the front panel of the board.

No 1 (green)	when lit:	proper voltage supply.
No 2 (red)	when lit:	fire alarm in section #1
No 3 (yellow)	when lit:	fault in section #1
No 4 (red)	when lit:	fire alarm in section #2
No 5 (yellow)	when lit:	fault in section #2
No 6 (red)	when lit:	fire alarm in section #3
No 7 (yellow)	when lit:	fault in section #3
No 8 (red)	when lit:	fire alarm in section #4
No 9 (yellow)	when lit:	fault in section #4

Fuse

The battery voltage is fused. If the fuse is blown a signal is activated in the back plane. The fuse is accessible on the front panel of the board, and can be used for disconnecting the power.

Fuse rating: 2 AT 5x20 mm

Setting the addresses

The address of the first GSK-2 board is set to binary 1, the second GSK-2 board is set to binary 2, etc.

Restarting the board

Remove the fuse from the board to disconnect the power. When the fuse is put back on, the board is restarted.

Replacing the board

To replace a board follow these steps:

1. Disconnect the power by removing the fuse.



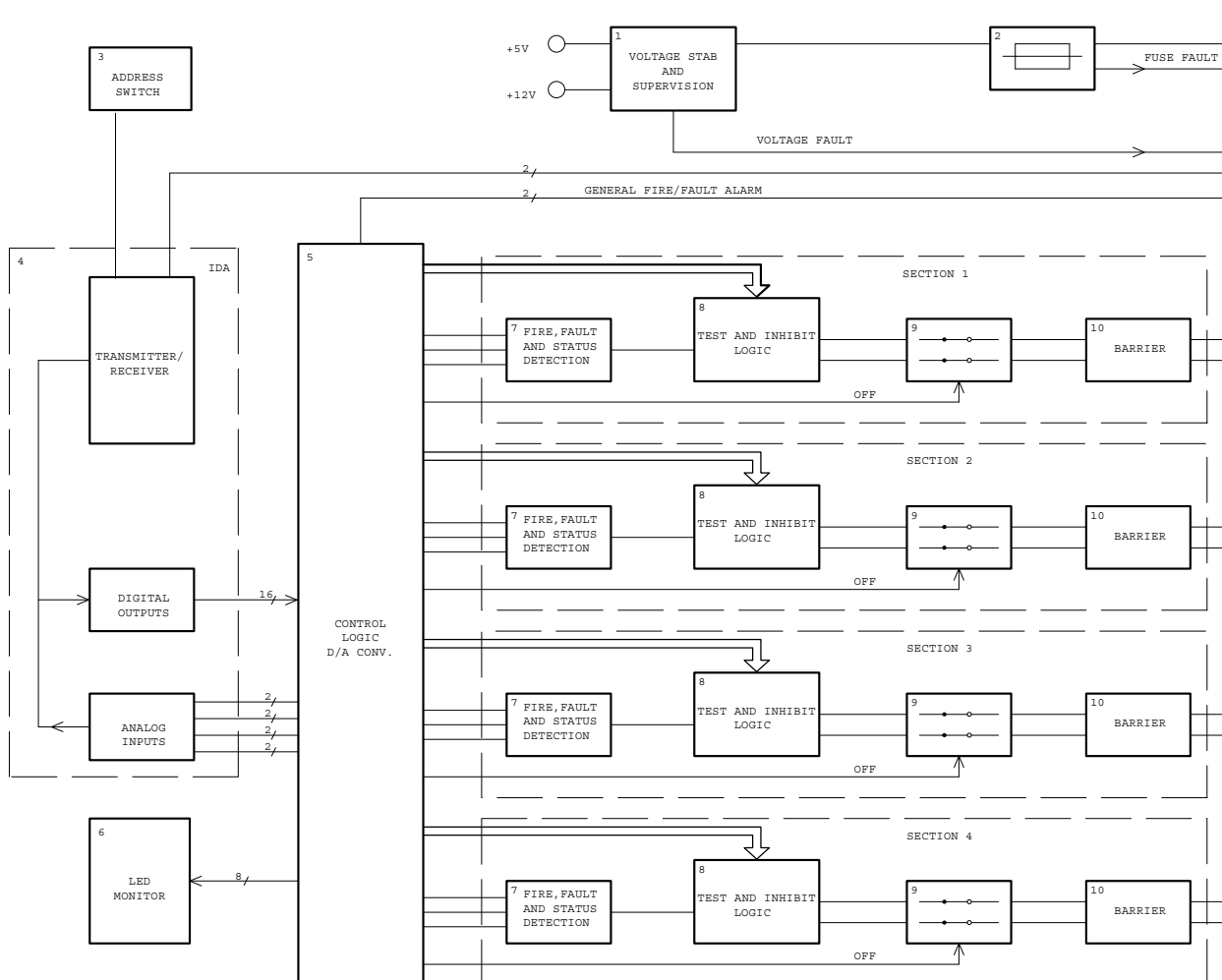
WARNING!

The power must be disconnected before the board is removed.

2. Remove the board and replace it with the new board.

Function

Block diagram



1. Voltage stabiliser

The board has a local voltage stabiliser for 5 VDC power and 12 VDC power. The 5 VDC is supplied to all logical circuits on the board. The presence of both powers is indicated by an LED. If one of the voltages should disappear, a signal is activated in the back-plane.

2. Supervision

The battery voltage is fused. If the fuse is blown a signal is activated in the back-plane. The fuse is accessible on the front panel of the board, and can be used for disconnecting the power.

3. Address switch

The address of the first section is set with this switch. The other three sections automatically receive the next three consecutive addresses.

4. IDA

Alarm signals, fault signals and status information are collected by two IDA-circuits, which communicate with the central unit. The IDA-circuits also controls the sections.

5. Control logic

Alarms and faults are latched in the GSK-2 board and at reset from the control unit the section is turned on and off again. Common fire alarms and cable break fault signals are also generated in the GSK-2. The alarm and fault signals are added which gives an analogue signal, enabling the IDA to give an auto-alarm.

6. LED indications

Fire alarm and fault indication are indicated on the front panel by one LED each per section.

7. Fire, fault and status detection

Fire alarms and faults are detected by two comparators. The signals are filtered before reaching the comparators. The status signal is an analogue signal that is used to indicate the status of the section, if it is "on", "off" or has disconnected smoke detectors.

8. Test and inhibit logic

When the disconnect smoke detector function is activated the output voltage to the sections is lowered to 12 VDC.

9. Electrical isolation

Each section can be electrical isolated from the central unit by a double relay.

10. Barrier

Each section output is protected against transients and hf-interference.

Technical data

Board size: Single Europe board, 100x160 mm.
Front panel: Anodised aluminium, width 6 TE (30.1 mm).

Ambient temperature: -10°C - +70°C.

Ambient humidity: 96% Hr.

Input power: U_{in} : 24 VDC (-20% -- + 25%).

Current consumption: $I_{in\ nom}$: 25 mA

$I_{in\ max}$: 70 mA.

Outputs

Four supervised for connection of sections with conventional digital detectors.

Output voltage: U_{in} : 24 VDC (-20% -- + 25%).

Output current: I_{out} : 2.4 mA at $U_{in} = 24\ V$.

Fire alarm: $I_{out\ min}$: 17 mA

Broken connection: $I_{out\ max}$: 0.8 mA

Interface board RS232K-2

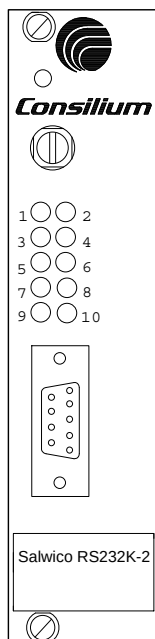
General

The RS232K-2 is an addressable interface board used for connecting the CS3000 system to external computers, modems, terminals, mimics, serial printers, etc.

The board is equipped with two RS232 channels and two RS485 channels. One of the RS232 channels is accessible through a D-sub header on the front panel and the other channels are connected via the back-plane.

The RS232K-2 is controlled by LPK-2 via the address and data buffers in the back plane. All channels are programmable for baud-rate and other communication parameters. The functions of the board are set by the definition programme.

Handling



Indications

There are ten green LEDs on the front panel of the board.

- No 1 when lit: proper voltage supply.
- No 2 when lit: the board is properly polled.
- No 3 when lit: RS232 channel #2 sending.
- No 4 when lit: RS232 channel #2 receiving.
- No 5 when lit: RS232 channel #2, RTS active.
- No 6 when lit: RS232 channel #2, CTS active.
- No 7 when lit: RS485 channel #1 sending.
- No 8 when lit: RS485 channel #1 receiving.
- No 9 when lit: RS485 channel #2 sending.
- No 10 when lit: RS485 channel #2 receiving.

Fuse

The battery voltage is fused. If the fuse is blown a signal is activated in the back plane. The fuse is accessible on the front panel of the board, and can be used for disconnecting the power.

Fuse rating: 250 mA 5x20 mm

Setting the address

The address of the board is set with a DIP-switch (SW1). The address bits #5 - #9 are set. Bit #5 is set with SW1-4. The address of each RS232K-2 board is set according to the definition in the Definition program. For more information see Appendix A.

Restarting the board

Remove the fuse from the board to disconnect the power. When the fuse is put back on, the board is restarted.

Replacing the board

To replace the RS232K-2 follow these steps:

1. Shut down the central by removing the fuses F3-F6 on the KE-2 rectifier.

**WARNING!**

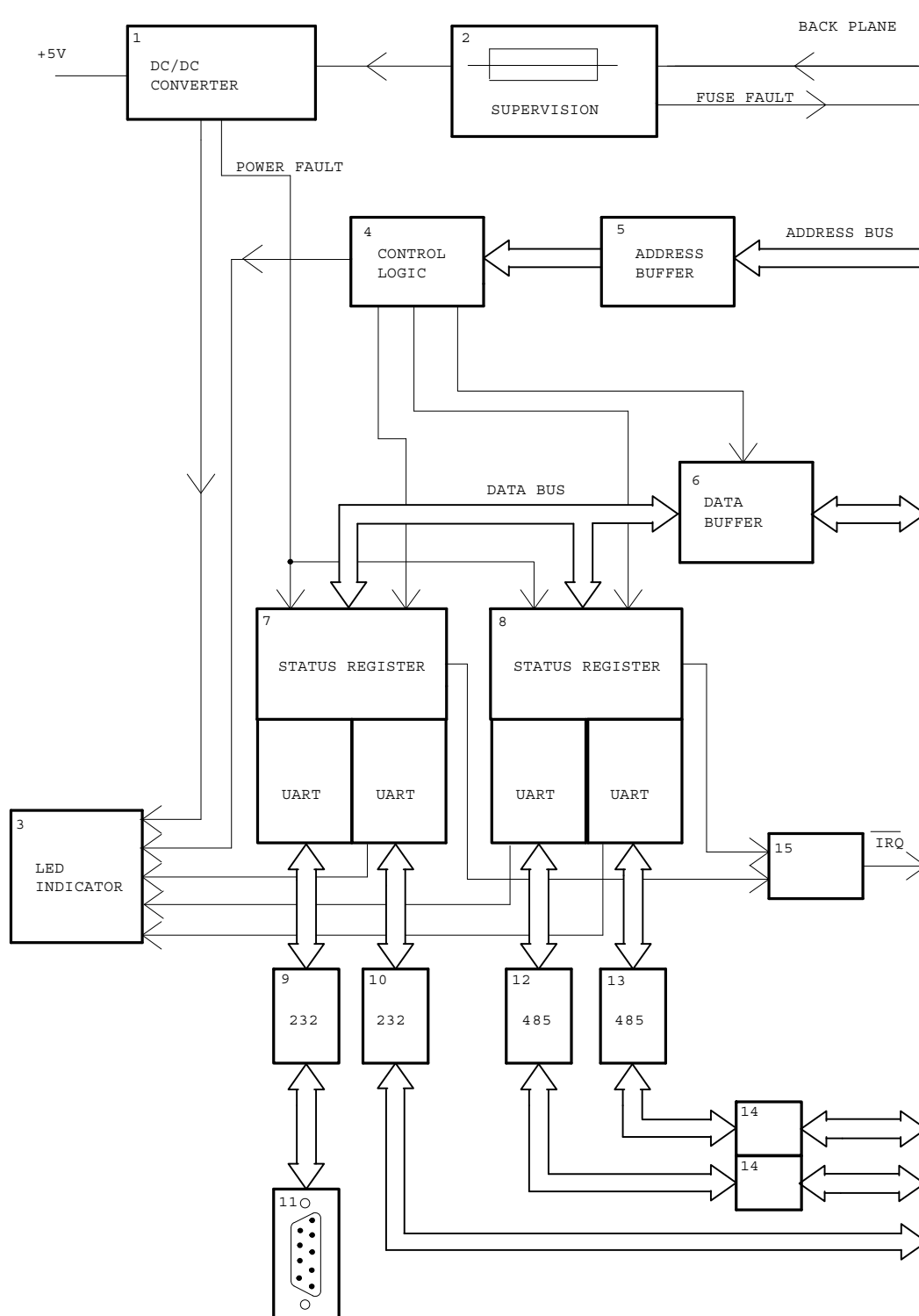
The power must be disconnected before the board is removed.

2. Remove the board and replace it with the new board.
3. Start up the central by inserting F3+F4 and F5+F6 in that order.

The circuit boards of the central unit

Function

Block diagram



1. DC/DC converter

The DC/DC circuit converts the battery voltage of the back plane to 5 VDC, which is supplied to all logical circuits on the board. Should the voltage disappear, a signal is activated in the back-plane.

2. Supervision

The battery voltage is fused. If the fuse is blown a signal is activated in the back-plane. The fuse is accessible on the front panel of the board, and can be used for disconnecting the power.

3. LED Indications

The 5 V voltage and proper polling are indicated by green LEDs. Send and receive for both the RS485 channels as well as send and receive and two control signals for one of the RS232 channels are also indicated by green LEDs.

4. Control logic

The address bus is decoded and selection signals for the two double serial channels are generated.

5. & 6. Buffers

The address bus, the data bus and the control signals are buffered before entering the board.

7. & 8. DUART circuits

Two of the DUARTs are for the RS232 channels and two is for the RS485 channels. All parameters, such as baud-rate, parity, etc., are programmable.

9. & 10. RS232 adaptation

Adaptations of the signals from 5 V logic to RS232 logic and vice versa. The signals from one channel are connected to a D-sub header on the front panel and the other are connected to the back plane.

11. RS232 D-SUB HEADER

Male 9-pin D-sub header on the front panel with IBM PC/AT pin-standard.

12. & 13. RS485 adaptation

Adaptations of the signals from 5 V logic to RS485 logic and vice versa. The signals from both channels are connected to the back plane.

14. Line protection

The line protector includes resistors for level definition of the line when not in use. Line protection with zener diodes and varistors.

Technical data

Board size:	Single Europe board, 100x160 mm.
Front panel:	Anodised aluminium, width 6 TE (30.1 mm).
Ambient temperature:	-10°C - +70°C.
Ambient humidity:	96% Hr.
Input power:	U_{in} : 24 VDC (-20% - +25%)
Current consumption:	$I_{in\ nom}$: 10 mA @ 24 V
	$I_{in\ max}$: 40 mA @ 24 V

Interface board KPK-2

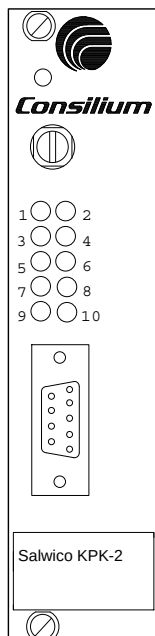
General

The KPK-2 is an addressable interface board used for connecting the CS3000 system to external computers, modems, terminals, mimics, serial printers, etc.

The board is equipped with two RS232 channels and two RS485 channels. One of the RS232 channels is accessible through a D-sub header on the front panel and the other channels are connected via the back-plane.

The KPK-2 is controlled by LPK-2 via the address and data buffers in the back plane. All channels are programmable for baud-rate and other communication parameters. The functions of the board are set by the definition programme.

Handling



Indications

There are ten green LEDs on the front panel of the board.

- No 1 when lit: proper voltage supply.
- No 2 when lit: the board is properly polled.
- No 3 when lit: RS232 channel #1 sending.
- No 4 when lit: RS232 channel #1 receiving.
- No 5 when lit: RS232 channel #2, sending.
- No 6 when lit: RS232 channel #2, receiving.
- No 7 when lit: RS485 channel #1 sending.
- No 8 when lit: RS485 channel #1 receiving.
- No 9 when lit: RS485 channel #2 sending.
- No 10 when lit: RS485 channel #2 receiving.

Fuse

The battery voltage is fused. If the fuse is blown a signal is activated in the back plane. The fuse is accessible on the front panel of the board, and can be used for disconnecting the power.

Fuse rating: 250 mA 5x20 mm

Setting the address

The address of the board is set with a DIP-switch (SW1), two switches. The recommended address and DIP-switch setting are provided in Appendix A.

Restarting the board

Remove the fuse from the board to disconnect the power. When the fuse is put back on, the board is restarted.

Replacing the board

To replace the KPK-2 follow these steps:

1. Shut down the central by removing the fuses F3-F6 on the KE-2 rectifier.



WARNING!

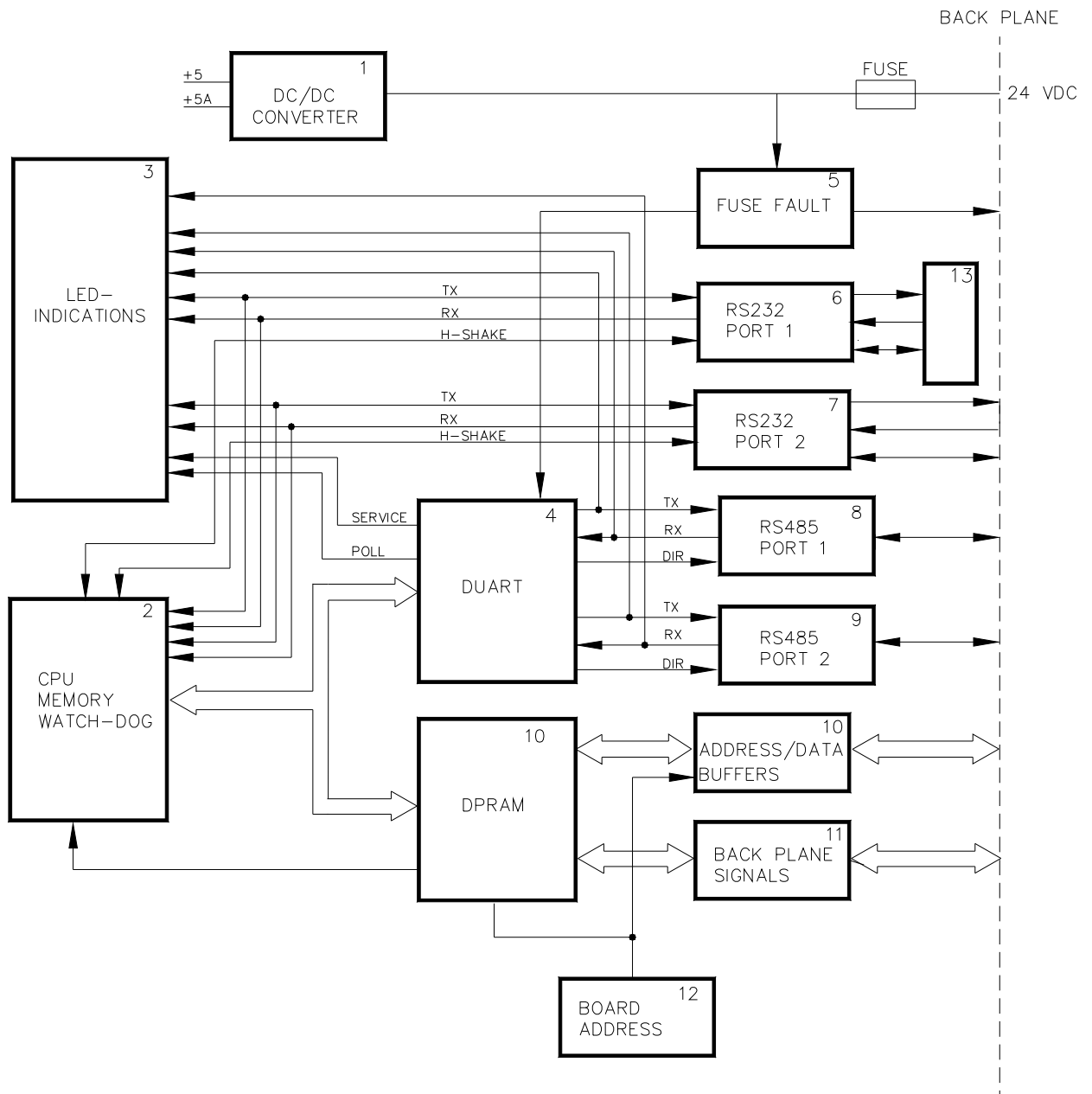
The power must be disconnected before the board is removed.

2. Remove the board and replace it with the new board.
3. Start up the central by inserting F3+F4 and F5+F6 in that order.

The circuit boards of the central unit

Function

Block diagram



1. DC/DC converter

The DC/DC circuit converts the battery voltage of the back plane to 5 VDC, which is supplied to all logical circuits on the board. Should the voltage disappear, a signal is activated in the back-plane. The DC/DC converter also supplies the serial port drivers with electric isolated power.

2. CPU/Memory/Watch-dog

Contains processor, memory, watch-dog and digital circuitry to provide system function.

3. LED Indications

The 5 V voltage and proper polling are indicated by green LEDs. Send and receive for both the RS485 channels as well as send and receive for the RS232 channels are also indicated by green LEDs. The serial channels can also be enabled/disabled by the CPU.

4. DUART circuits

Two of the DUARTs are for the RS232 channels and two is for the RS485 channels. All parameters, such as baud-rate, parity, etc., are programmable. Contains processor two serial ports which is connected to the RS485 transceivers. The DUART also control certain I/O on the board.

5. Fuse fault

The battery voltage is fused. If the fuse is blown a signal is activated in the back-plane. The fuse is accessible on the front panel of the board, and can be used for disconnecting the power.

6. & 7. RS232 adaptation

Adaptations of the signals from 5 V logic to RS232 logic and vice versa. The signals from one channel are connected to a D-sub header on the front panel and the other are connected to the back plane.

8. & 9. RS485 adaptation

Adaptations of the signals from 5 V logic to RS485 logic and vice versa. The signals from both channels are connected to the back plane.

10. & 11. Buffers

The address bus, the data bus and the control signals are buffered before entering the board.

12. Board address

Selects the board address.

13. RS232 D-SUB HEADER

Male 9-pin D-sub header on the front panel with IBM PC/AT pin-standard.

Technical data

Board size:	Single Europe board, 100x160 mm.
Front panel:	Anodised aluminium, width 6 TE (30.1 mm).
Ambient temperature:	-10°C - +70°C.
Ambient humidity:	96% Hr.
Input voltage:	U_{in} : 24 VDC (-20% - +25%)
Current consumption:	$I_{in\ nom}$: 25 mA @ 24 V
	$I_{in\ max}$: 25 mA @ 24 V

Rack CSR-3200

General

All PCBs in the central unit are mounted in a rack with a back plane. The back plane supplies all the PCBs with power and channels for communication between them. The rack has room for 14 PCBs. If needed, several racks can be inter-connected. The rack fits into a standard 19" cabinet.

Handling

Reserved PCB locations

Certain slots in the rack are reserved for special purposes.

The relay board ARK-2 must be placed in slot #1 of the first rack and is the only board allowed in this slot. If there are more than one rack inter-connected, slot #1 in the other racks must be empty.

The alarm processor board LPK-2 must be placed in slot #2 of the first rack and all boards communicating with the LPK-2 via the address and data bus must be in the same rack. If there are more than one rack inter-connected, slot #2 in the other racks may be used for other purposes.

If the interface board GSK-2 is used it may be placed in any available slot, with the above exceptions. In this case a loop processor board SPK-2 must be placed in the last slot (#14) of one of the racks.

Settings

The only necessary setting on the rack is made when an interface board GSK-2 shall be used for the connection of sections with conventional digital detectors. In this case a SPK-2 board in slot #14 will be using the internal IDA-loop, and therefore the two jumpers S01 and S02 must be set in their upper positions. These two jumpers are normally set in their lower positions by the factory.

Function

Each board occupies 30 mm of the width of the rack. The slots in each rack are numbered #1 - #14.

If more than one rack shall be inter-connected, this is done with flat cables connected to headers on the rear side of the racks.

In order to prevent noise from loads connected to the relay board ARK-2 from interfering with other boards, the power to the rack is divided in two separate channels, one supplying the relay board and one for the rest of the rack.

Technical data

Type:	Standard 19"
Height:	4 U (177 mm)
Depth:	215 mm
Number of slots:	14, each 6 TE width (30.1 mm)
Ambient temperature:	-10°C -- +70°C
Humidity:	96 % Rh
Input power:	U_{nom} : 24 VDC (-20% -- + 25%)

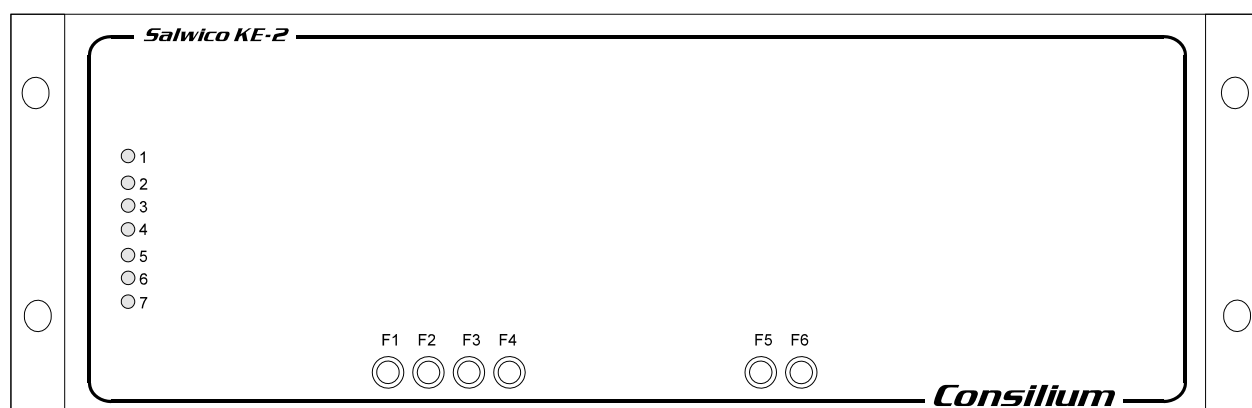
Power unit KE-2

General

The power unit KE-2 supplies the fire alarm system with the necessary power, either from mains, from batteries or from an other emergency source.

The power unit is under continuous supervision and controlled by the central unit, which controls voltages, currents and certain faults. Important status data are indicated by LEDs.

The KE-2 battery has a programmable charging characteristic consisting of five different charging phases: soft start, constant current, constant voltage, equalisation and maintenance charging.



Indications

There are seven LEDs on the front panel of the power unit.

LED no.	Colour	Function
1	Green	Mains voltage
2	Green	Emergency voltage
3	Green:	Rapid charge
4	Yellow	General fault indication
5	Yellow	Battery fault
6	Yellow	Mains/emergency fault
7	Yellow	Earth fault indication

Fuses

There are six fuses on the front panel.

Fuse no.	Function	Rating
F1	Auxiliary output	4 AT 6,3 x 32 mm
F2	Auxiliary output	4 AT 6,3 x 32 mm
F3	Battery fuse +	16 AT 6,3 x 32 mm
F4	Battery fuse -	16 AT 6,3 x 32 mm
F5	Net fuse	4 AT 6,3 x 32 mm
F6	Net fuse	4 AT 6,3 x 32 mm

**WARNING!**

When starting up the central first insert fuses F3+F4, and then F5+F6 in that order.

Technical data

Mains/emergency voltage:	230 V +10%/-15%
Mains/emergency frequency:	50-60 Hz
Output current :	$I_{\min}$: 0.1 A $I_{\max}$: 20 A *
Output voltage:	U_{out} : 23 - 26 VDC U_{rip} : ± 0.2 VDC

* Output current is of higher priority than battery charging current. If the output current exceeds 8 A the battery charging current will decrease. The battery charging current is equal to zero when the output current is equal to 20 A.

Battery charging

Charging current:	I_{charge} : 0 - 10 A **
Charging voltage:	U_{charge} : 21.5 - 34.0 ± 0.2 VDC

** The charging current and the charging voltage can be set individually for the different charging phases. The charging current can be set between 0-10 A and the charging voltage can be set between 21 - 34 VDC.

Appendix A: DIP switch settings

The addresses of the following boards, the INK-2, RS232K-2, KPK-2 and UTK-2, are set with a DIP switch. The setting of the DIP switches and the corresponding hexadecimal addresses are listed below.

The address set on the DIP switch must correspond to the address specified in the Definition program .

INK-2



Address Hex.

CC

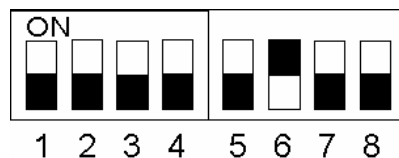
RS232K-2 board 1



Address Hex.

E0

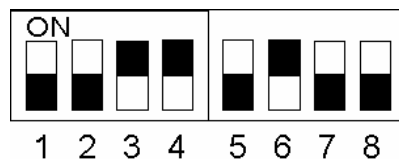
RS232K-2 board 2



Address Hex.

80

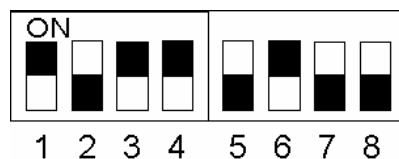
UTK-2 board 1



Address Hex.

B0

UTK-2 board 2



Address Hex.

B4

UTK-2 board 3



Address Hex.

B8

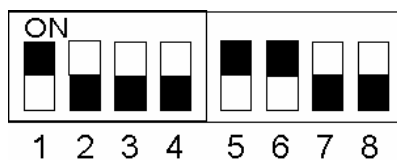
UTK-2 board 4



Address Hex.

BC

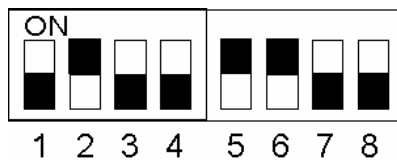
UTK-2 board 5



Address Hex.

C4

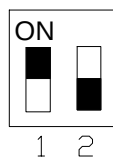
UTK-2 board 6



Address Hex.

C8

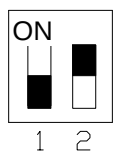
KPK-4 board 1



Address Hex.

100

KPK-4 board 2



Address Hex.

200

Appendix B: Fault codes CS3000 version 4

All the fault codes, their cause and how an operator with some knowledge of the system can solve the problem, are listed below. When a fault occurs, localise the problem and deal with it.

The word FAULT is displayed on the first line of the display together with a fault code followed by the section number and the address for the section unit causing the problem, if the system has this information. Additional text is displayed on line two, if provided. A few fault codes can not be displayed with all this information. These fault codes are marked with an asterisk (*) in the summary below.

1 CONTROL UNIT MISSING

The central unit is missing a control unit after cold start.

Cause	Remedy
System loop break.	Mend the cable.
Control unit incorrectly addressed.	Check and readdress the control unit.
Hardware fault in the control unit.	Exchange the unit.
Wrong number of control units in the definition.	Check the specification and redefine the system.

2 ADDITIONAL CONTROL UNIT

An additional control unit is found by the central unit after cold start.

Cause	Remedy
Wrong definition of number of control units.	Check the specification and redefine the system.

3 MISSING CENTRAL UNIT

The main central unit is missing a sub-central after cold start.

Cause	Remedy
LPK-2 in a central unit is incorrectly addressed.	Set a valid address.
System loop break.	Mend the cable.
LPK-2 has a hardware fault.	Exchange the board.
Wrong definition of number of repeater panels.	Check the specification and redefine the system.

4 ADDITIONAL CENTRAL UNIT

An additional sub-central is found by the central unit after cold start.

Cause	Remedy
Wrong definition of number of central units.	Check the specification and redefine the system.

5 SECTION(S) MISSING

The main central unit is missing a section after cold start.

Cause	Remedy
SPK-2 or LPK-2 has a hardware fault.	Exchange the board.
Wrong definition of number of sections.	Check the specification and redefine the system.

6 ADDITIONAL SECTION(S)

An additional section has been found by the central unit after cold start.

Cause	Remedy
Wrong definition of number of sections.	Check the specification and redefine the system.

7 MISSING SECTION UNIT(S)

Fewer section units has been found than defined in the loop.

Cause	Remedy
Wrong definition of number of section units.	Check the specification and redefine the system.
Section unit connections faulty.	Connect the unit correctly
Missing answer from a section unit.	Exchange the unit.

8 ADDITIONAL SECTION UNIT(S)

More section units have been found than defined in the loop.

Cause	Remedy
Wrong definition of number of section units.	Compare the installation with the drawings. Redefine the system.
Section unit connections faulty.	Connect the unit correctly.

21 BAD ANSWER (Abnormal condition)

Bad communication with one section unit or several section units, could be temporary. This fault code is sent when an interference in the communication is detected.

Cause	Remedy
Bad communication with one or several section units.	Exchange the section unit if the condition remains or returns.

22 NO ANSWER

No polling answer from a section unit.

Cause	Remedy
Wrong type of section unit.	Exchange to the correct section unit.
Two section units have the same address.	Check the units.
Hardware fault	Exchange the unit.
A fuse is blown. A secondary fault appears, code (83).	Exchange the fuse.
Cable break in a loop or system loop. A secondary fault APPEARS, code (121).	Mend the cable. See Cable break at the end of this chapter.

24 WRONG STATUS

Incorrect answer from the section unit.

Cause	Remedy
Section unit faulty	Exchange the section unit.

25 WRONG ID

The software does not recognise the ID of a section unit.

Cause	Remedy
Section unit faulty.	Exchange the section unit.
Wrong software in CS3000.	Exchange the software.
Wrong type of detector has been installed.	Install the correct type of detector. Restart the system.

26 BAD COMMUNICATION IN A LOOP (Abnormal condition)

Bad communication in a loop.

Cause	Remedy
Noisy environment.	Test the loop. Measure the cable resistance. See Cable break at the end of this chapter.

41 SECTION BOOTING

A section in the system has generated a boot signal.

Cause	Remedy
The system is booting. Which PCB that is booting is shown in the display.	Reset the fault.

42 BOOT DISABLED

A section unit was disconnected by the system during the initialisation.

Cause	Remedy
Section unit faulty.	Exchange the section unit.
Address unit on a sub-loop is faulty.	Test the sub-loop.

43 WRONG ADDRESS INTERVAL

The section unit address interval set for a timer is wrong.

Cause	Remedy
Overlapping address intervals.	Set a valid address interval.
End-address of the interval is lower then the start-address.	Set a valid address interval.

61 MEMORY CKECKSUM ERROR

Data in memoryhas been unintentionally damaged.

Cause	Remedy
Error in RAM or EPROM.	Restart. If the fault returns exchange the unit.

62 DEFINITION DATA ERROR

A fault has been discovered in the memory where the system definition is stored.

Cause	Remedy
Faulty LPK-2.	Replace LPK.
Error in definition data.	Download new definition data.
Wrong software version.	Upgrade software version in LPK.

64 LOOP POLL FAULT

Cause	Remedy
The communication between the loop units is interrupted either because a hanging for more than 20 seconds on a certain unit or because a polling cycle takes too long time. The fault can appear when a command is given to set outputs for a particular loop unit.	Localise the faulty unit and replace it. Localisation can be done e.g. by interval-halving technique.

81 MAINS FAULT

Mains power failure.

Cause	Remedy
Mains power missing.	Attend to the problem.
Fuses are blown in the system.	Exchange the fuses.
Cable break.	Mend the cable. See Cable break at the end of this chapter.

FAULT (81) 1 POWER MAINS FAULT

Mains power failure in the power unit.

83 FUSE FAULT

A fuse in the central unit is blown. Different messages are displayed depending on the location of the fuse.

Cause	Remedy
A fuse is blown. In the display is shown which fuse is blown.	Exchange the fuse. See Fuses at the end of this chapter.

84 VOLTAGE FAULT

Too low voltage in the system.

Cause	Remedy
Internal voltage fault.	Exchange the PCB.

85 I/O-FAULT

An I/O-board is faulty or missing.

Cause	Remedy
Incorrect numbers of I/O-boards.	Correct it.
One of the boards ARK-2, INK-2, UTK-2, RS232K-2 or KPK-2 is faulty.	Exchange the board.

90 POLLUTED DETECTOR (Abnormal condition)

Cause	Remedy
Detector head is polluted.	Optical smoke detector: Clean the detector head according to the recommendations. Ionization smoke detector: Exchange the detector.

93 FUSE/CABLE FAULT

A fuse in the central unit is blown or there is a cable break. Different messages are displayed depending on the location of the fuse.

Cause	Remedy
A fuse is blown in the central unit.	Exchange the fuse. See <i>Fuses</i> at the end of this chapter.
Cable break.	Mend the cable. See <i>Cable break</i> at the end of this chapter.

FAULT (93) EXT.ALARM 9 FUSE/CABLE FAULT

A fuse blown or a cable break in external alarm device 9.

FAULT (93) BATTERY FUSE/CABLE FAULT

Battery fuse blown, cable break or bad battery in central unit.

101 ALARM FUNCTION FAILURE

Cause	Remedy
The alarm function in the detector does not work.	Exchange the detector.

102 THERMISTOR FAULT

Cause	Remedy
Thermistor in a heat detector faulty.	Exchange the detector.

103 ION SMOKE CHAMBER FAULT

Cause	Remedy
Ion chamber in an ionization detector faulty.	Exchange the detector.

121 CABLE BREAK

Indicates that one of the system loops or a detector loop is faulty. Additional fault codes can be NO ANSWER (22), MISSING REPEATER PANEL (1) or CENTRAL UNIT MISSING (3).

Cause	Remedy
One of the system loops, a detector loop or a conventional loop is faulty.	Mend the cable. See Cable break at the end of this chapter.

FAULT (121) EXT.COMM 2 CABLE BREAK

The cable break is in system loop no 2. The fault can only be reset when the central is allowed to communicate on the loop. This message can only emanate from the central unit itself.

FAULT (121) SEC 1 CABLE BREAK

Cable break in detector loop. See also (125).

124 SUBLOOP CABLE BREAK

Cause	Remedy
Cable break in sub-loop.	Mend the cable. See Cable break at the end of this chapter.
Missing end-of-line unit.	Connect an end-of-line unit.

125 SHORT CIRCUIT ON LOOP

Short circuit in detector loop reported by a short circuit isolator. If more than one short circuit isolator has given a fault message, the short circuit is situated between them. The detectors between the short circuit isolators will give messages of the type NO ANSWER (22). One message is always CABLE BREAK (121), since the loop is broken. The short circuit faults must always be reset before other faults.

Cause	Remedy
Short circuit on detector loop	See Short circuit at the end of this chapter.

126 SHORT CIRCUIT ON PRIM. SIDE

Cause	Remedy
Short circuit between the positive and negative terminal on the primary side.	Attend to the problem.

127 SHORT CIRCUIT ON SEC. SIDE

Cause	Remedy
Short circuit between the positive and negative terminal on the secondary side.	Attend to the problem.

141 EARTH FAULT +

Cause	Remedy
Earth fault between positive terminal and earth.	See <i>Earth fault</i> at the end of this chapter.

FAULT (141) POWER EARTH FAULT +
Earth fault to plus from the power unit.

142 EARTH FAULT-

Cause	Remedy
Earth fault between negative terminal and earth.	See <i>Earth fault</i> at the end of this chapter.

FAULT (142) POWER EARTH FAULT -
Earth fault to minus from the power unit.

145 LOW VOLTAGE

Cause	Remedy
Too low system voltage from the power unit.	Test the rectifier and measure the voltage. Too low voltage: → Exchange the rectifier. Normal voltage: → Exchange the IOK-4 board.

146 HIGH VOLTAGE (Abn. condition)

Cause	Remedy
Too high system voltage from power unit.	Test the rectifier and measure the voltage. Too high voltage: → Exchange the rectifier. Normal voltage: → Exchange the IOK-4 board.

Cable break

No answer from any section unit

- The cable is broken before the first section unit on a single ended loop.
- The cable is broken before the first section unit at least once and it is also broken after the last section unit, if the loop is a double ended loop.

Section units are answering

Look for the last section unit answering on each side of the loop. The cable break is situated after or between these units.

Earth fault

- Check the earth fault circuit, change it if it is faulty.
- If the circuit is working properly, check the loops one by one.
- Disconnect the loops one by one, see Disconnection, Electric isolation of a loop.

Short circuit

No answer from any section unit

Search for the short circuit between the central unit and the short circuit isolator.

Section units are answering

Search for the short circuit between the short circuits reporting the faults.

Proceed as follows when you want to locate an earth fault. Divide the cable in two halves, locate the earth fault on one of the halves. Thereafter divide this part of the cable into two halves. Continue to divide the cable into halves until you have found the earth fault. If you are using a multimeter use the diode tester range.

Fuses

Check the fuses on the boards included in the system. The fuses are mounted on the front panels on the following boards: ARK-2, GSK-2, INK-2, KPK-4, LPK-2, RS232K-2, SPK-2 and UTK-2. The fuses to the IKK-4 are mounted on the board itself.

Fault code	Board	Fuse	Fuse rating	
81	CSS3300	2A5 Net fuse	5 AT	5x20 mm
81	CSS3300	2A5 Net fuse	5 AT	5x20 mm
83	ARK-2	F1: Output 24 VDC 1+	2A	5x20 mm
83	ARK-2	F2: Output 24 VDC 1-	2A	5x20 mm
83	ARK-2	F3: Output 24 VDC 2+	2A	5x20 mm
83	ARK-2	F4: Output 24 VDC 2-	2A	5x20 mm
83	GSK-2	Main fuse	2AT	5x20 mm
83	INK-2	Main fuse	250 mAT	5x20 mm
83	KPK-2	Main fuse	250 mAT	5x20 mm
83	LPK-2	Main fuse *	250 mAT	5x20 mm
83	RS232K-2	Main fuse	250 mAT	5x20 mm
83	SPK-2	Main fuse	1AT	5x20 mm
83	UTK-2	Main fuse	250 mAT	5x20 mm
93	ARK-2	F5: Alarm bell output 1+	2A	5x20 mm
93	ARK-2	F6: Alarm bell output 1-	2A	5x20 mm
93	ARK-2	F7: Alarm bell output 2+	2A	5x20 mm
93	ARK-2	F8: Alarm bell output 2-	2A	5x20 mm
93	ARK-2	F9: Alarm bell output 3-	2A	5x20 mm
93	ARK-2	F10: Alarm bell output 3+	2A	5x20 mm
93	CSS3300	F4: Battery fuse	10AT	6,3x32 mm
93	CSS3300	F5: Battery fuse	10AT	6,3x32 mm
Not supervised	ARK-2	F11: Relay output RL1	2A	5x20 mm
Not supervised	ARK-2	F12: Relay output RL2	2A	5x20 mm
Not supervised	ARK-2	F13: Relay output RL3	2A	5x20 mm
Not supervised	ARK-2	F14: GA-output	2A	5x20 mm
Not supervised	IKK-4	F1: Control unit panel	500 mAT	5x20 mm
Not supervised	IKK-4	F2: Main fuse	100 mAT	5x20 mm
Not supervised	IKK-4	F3: Main fuse for F4-F5	500 mAT	5x20 mm
Not supervised	IKK-4	F4: Power supply ext. device	315 mAT	5x20 mm
Not supervised	IKK-4	F5: Power supply	315 mAT	5x20 mm

* The central unit is not working properly. Indicator No. 1 (green) is not lit.

Appendix C: Fault codes CS3000 version 6

Listed below are all fault codes, their causes and how an operator with some knowledge of the system can solve the problem. When a fault occurs, localise the problem and deal with it.

The word FAULT is displayed on the first line of the display together with a fault code, followed by the zone number and the address for the loop unit causing the problem, if the system has this information. Additional text is displayed on line two, if provided. A few fault codes cannot be displayed with all this information. These fault codes are marked with an asterisk (*) in the summary below.

FIRE IN SYSTEM

There is a fire alarm in the system and the LPK board is not answering.

1 MISSING CONTROL UNIT

The central unit is missing a control unit after cold start.

Cause	Remedy
System loop break.	Mend the cable.
Control unit incorrectly addresses.	Check and readdress the control unit.
Hardware fault in the control unit.	Exchange the unit.
Wrong number of control units in the definition.	Check the specification and redefine the system.

2 ADDITIONAL CONTROL UNIT

The central unit found an additional control unit after cold start.

Cause	Remedy
Wrong definition of number of control units.	Check the specification and redefine the system.

3 MISSING CENTRAL

The main central unit is missing a sub-central after cold start.

Cause	Remedy
LPK-2 in a central unit is incorrectly addressed.	Set a valid address.
System loop break.	Mend the cable.
LPK-2 has a hardware fault.	Exchange the board.
Wrong definition of number of repeater panels.	Check the specification and redefine the system.

4 ADDITIONAL CENTRAL

The central unit found an additional sub-central unit after cold start.

Cause	Remedy
Wrong definition of number of central units.	Check the specification and redefine the system.

5 LOOP(S) MISSING

The main central unit is missing a loop after cold start.

Cause	Remedy
SPK-2 or LPK-2 has a hardware fault.	Exchange the board.
Wrong definition of number of loops.	Check the specification and redefine the system.

6 ADDITIONAL LOOP(S)

The central unit found an additional loop after cold start.

Cause	Remedy
Wrong definition of number of loops.	Check the specification and redefine the system.

7 MISSING LOOP UNIT

Fewer loop units have been found than defined in the loop.

Cause	Remedy
Wrong definition of number of loop units.	Check the specification and redefine the system.
Loop unit connections faulty.	Connect the unit correctly
Missing answer from a loop unit.	Exchange the unit.

8 ADDITIONAL LOOP UNIT(S)

More loop units have been found than defined in the loop.

Cause	Remedy
Wrong definition of number of loop units.	Check the specification and redefine the system.
Loop unit connections faulty.	Connect the unit correctly.

11 LOOP MISSING DEF. DATA

Cause	Remedy
The loop has not been defined properly at the installation.	Redefine the loop.

12 SUBCENTRAL MISSING DEF. DATA

Cause	Remedy
The sub-central has not been defined properly at the installation.	Define the sub-central.

13 WRONG TYPE OF CONTROL UNIT

Cause	Remedy
Wrong definition at the installation of the control unit.	Redefine the sub-central.

21 BAD ANSWER (Abnormal condition)

Bad communication with one loop unit or several loop units, this could be temporary. This fault code is sent when interference in the communication is detected.

Cause	Remedy
Bad communication with one or several loop units.	Exchange the loop unit if the condition remains or returns.

22 NO ANSWER

The loop unit doesn't answer.

Cause	Remedy
Wrong type of section unit.	Exchange to the correct section unit.
Two loop units have the same address.	Check the units.
Hardware fault	Exchange the unit.
A fuse is blown. A secondary fault appears, code (83).	Exchange the fuse.
Cable break in a loop or system loop. A secondary fault APPEARS, code (121).	Mend the cable. See Cable break at the end of this chapter.

24 WRONG IDA STATUS

Incorrect answer from the loop unit.

Cause	Remedy
Loop unit faulty	Exchange the loop unit.

25 UNKNOWN ID

The software does not recognise the ID of a loop unit.

Cause	Remedy
Loop unit faulty.	Exchange the loop unit.
Wrong software in CS3000.	Exchange the software.
Wrong type of detector has been installed.	Install the correct type of detector. Restart the system.

26 BAD LOOP COMM (Abnormal condition)

Bad communication in a loop.

Cause	Remedy
Noisy environment.	Test the loop. Measure the cable resistance. See Cable break at the end of this chapter.

27 LOOP COMM STOPPED

No communication in a loop.

Cause	Remedy
A loop unit is faulty.	Check and if necessary exchange the loop unit.

28 LOOP TRANS. STOPPED

Loop communication stopped.

Cause	Remedy
Loop modem cannot transmit.	Turn off the power, wait for 5 minutes, then restart the system.
Faulty loop unit.	Search for the faulty unit by interval-halving and replace the unit.

29 COMMUNICATION ERROR

A loop unit has sent a wrong checksum.

Cause	Remedy
Two loop units have the same address.	Check the addresses of the units and set correct addresses.
Loop unit faulty.	Exchange the unit.

30 CONTROL UNIT X NO POLL FROM MAIN CENTRAL

There is no contact between control unit x and the main central unit.

Cause	Remedy
The LPK in the main central unit is not answering.	The LPK is faulty. Replace it.
Cable break in the system loop.	Check the cable.

41 BOOTED

A loop in the system has generated a boot signal.

Cause	Remedy
The system is booting. Which PCB that is booting is shown in the display.	Reset the fault.

42 BOOT DISABLED

A loop unit was disconnected by the system during the initialisation.

Cause	Remedy
Loop unit faulty.	Exchange the section unit.
Address unit on a sub-loop is faulty.	Test the sub-loop.

43 WRONG ADDRESS INTERVAL

The loop unit address interval set for a timer is wrong.

Cause	Remedy
Overlapping address intervals.	Set a valid address interval.
End-address of the interval is lower then the start-address.	Set a valid address interval.

44 ILLEGAL ADDRESS

The received address does not correspond with the sent address.

Cause	Remedy
Loop unit faulty.	Exchange the loop unit.

51 LOOP OUTPUT MISSING

Cause	Remedy
The loop unit has no active outputs. Error in the site set-up.	Download new set-up data.

61 MEMORY CHECKSUM ERROR

Data in memory has been unintentionally damaged.

Cause	Remedy
Error in RAM or EPROM.	Restart. If the fault returns exchange the unit.

62 SETUP DATA ERROR

A fault has been discovered in the memory where the system definition is stored.

Cause	Remedy
Faulty LPK-2.	Replace LPK.
Error in definition data.	Download new definition data.
Wrong software version.	Upgrade software version in LPK.

64 LOOP POLL FAULT

Cause	Remedy
The communication between the loop units is interrupted either because a hanging for more than 20 seconds on a certain unit or because a polling cycle takes too long time. The fault can appear when a command is given to set outputs for a particular loop unit.	Localize the faulty unit and replace it. Localization can be done e.g. by interval-halving technique.

81 MAINS FAULT

Mains power failure.

Cause	Remedy
Mains power missing.	Attend to the problem.
Fuses are blown in the system.	Exchange the fuses.
Cable break.	Mend the cable. See Cable break at the end of this chapter.

Example:

FAULT (81) 1 POWER MAINS FAULT
Mains power failure in the power unit.

83 FUSE FAULT

A fuse in the central unit is blown. Different messages are displayed depending on the location of the fuse.

Cause	Remedy
A fuse is blown. In the display is shown which fuse is blown.	Exchange the fuse. See Fuses at the end of this chapter.

84 LOW VOLTAGE

Too low voltage in the system.

Cause	Remedy
Internal voltage fault.	Exchange the PCB.

85 I/O-FAULT

An I/O-board is faulty or missing.

Cause	Remedy
Incorrect numbers of I/O-boards.	Correct it.
One of the boards ARK-2, INK-2, UTK-2, RS232K-2 or KPK-2 is faulty.	Exchange the board.

90 POLLUTED DETECTOR (Abnormal condition)

Cause	Remedy
Detector head is polluted.	Optical smoke detector: Clean the detector head according to the recommendations. Ionization smoke detector: Exchange the detector.

93 FUSE/CABLE FAULT

A fuse in the central unit is blown or there is a cable break. Different messages are displayed depending on the location of the fuse.

Cause	Remedy
A fuse is blown in the central unit.	Exchange the fuse. See Fuses at the end of this chapter.
Cable break.	Mend the cable. See Cable break at the end of this chapter.

Example:

FAULT (93) EXT.ALARM 9 FUSE/CABLE FAULT

A fuse blown or a cable break in external alarm device 9.

FAULT (93) BATTERY FUSE/CABLE FAULT

Battery fuse blown, cable break or bad battery in central unit.

96 BATTERY FUSE/CABLE FAULT

A battery fuse is blown in the central unit or a there is a cable break. Different messages will be displayed depending on the cause of the problem.

Cause	Remedy
A fuse is blown in the central unit.	Exchange the fuse. See Fuses at the end of this chapter.
Cable break.	Mend the cable. See Cable break at the end of this chapter.

101 ALARM FUNCTION FAILURE

Cause	Remedy
The alarm function in the detector does not work.	Exchange the detector.

102 THERMISTOR FAULT

Cause	Remedy
Thermistor in a heat detector faulty.	Exchange the detector.

103 ION SMOKE CHAMBER FAULT

Cause	Remedy
Ion chamber in an ionization detector faulty.	Exchange the detector.

121 CABLE BREAK

Indicates that one of the system loops or a detector loop is faulty. Additional fault codes can be NO ANSWER (22), MISSING REPEATER PANEL (1) or CENTRAL UNIT MISSING (3).

Cause	Remedy
One of the system loops, a detector loop or a conventional loop is faulty.	Mend the cable. See Cable break at the end of this chapter.

Example:

FAULT (121) EXT.COMM 2 CABLE BREAK

The cable break is in system loop no 2. The fault can only be reset when the central is allowed to communicate on the loop. This message can only emanate from the central unit itself.

FAULT (121) SEC 1 CABLE BREAK

Cable break in detector loop. See also (125).

124 SUBLOOP CABLE BREAK

Cause	Remedy
Cable break in sub-loop.	Mend the cable. See Cable break at the end of this chapter.
Missing end-of-line unit.	Connect an end-of-line unit.

125 SHORT CIRCUIT

Short circuit in detector loop reported by a short circuit isolator. If more than one short circuit isolator has given a fault message, the short circuit is situated between them. The detectors between the short circuit isolators will give messages of the type NO ANSWER (22). One message is always CABLE BREAK (121), since the loop is broken. The short circuit faults must always be reset before other faults.

Cause	Remedy
Short circuit on detector loop	See Short circuit at the end of this chapter.

126 SHORT CIRCUIT ON PRIM. SIDE

Cause	Remedy
Short circuit between the positive and negative terminal on the primary side.	Attend to the problem.

127 SHORT CIRCUIT ON SEC. SIDE

Cause	Remedy
Short circuit between the positive and negative terminal on the secondary side.	Attend to the problem.

141 EARTH FAULT +

Cause	Remedy
Earth fault between positive terminal and earth.	See Earth fault at the end of this chapter.

FAULT (141) POWER EARTH FAULT +
Earth fault to plus from the power unit.

142 EARTH FAULT-

Cause	Remedy
Earth fault between negative terminal and earth.	See <i>Earth fault</i> at the end of this chapter.

FAULT (142) POWER EARTH FAULT –
Earth fault to minus from the power unit.

145 LOW VOLTAGE

Cause	Remedy
Too low system voltage from the power unit.	Test the rectifier and measure the voltage. If necessary exchange the rectifier.

146 HIGH VOLTAGE (Abnormal. condition)

Cause	Remedy
Too high system voltage from power unit.	Test the rectifier and measure the voltage. If necessary exchange the rectifier.

147 FIRE PREWARNING

Cause	Remedy
The system has detected a smoke value approaching the alarm level.	Check the unit.

150 TIMER STUCK

Cause	Remedy
The timer does not work properly.	Check the unit.

161 DOOR OPEN

Cause	Remedy
A door is still open one minute after the instruction to close it was sent.	Check the door.

163 OPEN DOOR SUBLOOP BREAK

Cause	Remedy
Cable break between module and open door sensor.	Mend the cable.

164 DOOR CLOSED SUBLOOP BREAK

Cause	Remedy
Cable break between module and closed door sensor.	Mend the cable.

166 DAMPER /DOOR SHOULD HAVE BEEN OPENED

Cause	Remedy
Damper/door in wrong position.	Check for obstruction.

167 DAMPER /DOOR SHOULD HAVE BEEN CLOSED

Cause	Remedy
Damper/door in wrong position.	Check for obstruction.

170 SENSOR FAULT

The detector is giving a too low analogue value.

Cause	Remedy
The detector has a faulty sensor element.	Replace the detector.
NB This fault could be the result of air blowing at the unit.	Check the location of the detector and if need be, move it to a less windy location.

171 CABLE BREAK FROM INPUT 1

Cause	Remedy
There is a cable break on input 1.	Check the cable.

172 CABLE BREAK FROM INPUT 2

Cause	Remedy
There is a cable break on input 2.	Check the cable.

173 DOOR FEEDBACK

Cause	Remedy
There is no response from the door-holding relay.	Check the door-holder relay and its cable.

174 NO POWER SUPPLY FOR LOOP

Cause	Remedy
No power feed from the pcb.	DC/DC converter faulty.

175 DOOR IN WRONG POSITION

Cause	Remedy
Door in wrong position.	Check for obstruction.

176 CABLE BREAK POSITIVE SIDE

Cause	Remedy
Check for a cable break on positive lead.	Mend the cable break.
A tripped short circuit isolator can cause this fault.	Check the short circuit isolators.

177 CABLE BREAK NEGATIVE SIDE

Cause	Remedy
Check for a cable break on negative lead.	Mend the cable break.
A tripped short circuit isolator can cause this fault.	Check the short circuit isolators.

178 WRONG TYPE OF LOOP UNIT FOUND

Cause	Remedy
Check the ID setting of the faulty unit.	Set a correct value on the DIP-switch of the unit.

179 UNABLE TO DETECT SHORT CIRCUIT

Cause	Remedy
Unable to detect short circuit.	Exchange loop-PCB.

180 SPRINKLER VALVE CLOSED

Cause	Remedy
Sprinkler valve closed.	Check why it is closed.

181. SHORT CIRCUIT ON SUBLOOP

Cause	Remedy
Short circuit on subloop.	Check cable.

182 CABLE BREAK

Cause	Remedy
A cable break has been detected.	Check corresponding cables.

183 CABLE OVERLOAD, CURRENT LIMIT REACHED

Cause	Remedy
There is an overload in the cable.	Check if too many units are connected to the cable. Compare with cable data.

184 POWER FAULT

Cause	Remedy
The power supply is lost.	Check power generation.

185 LOSS OF CAPACITY TO CHARGE BATTERY

Cause	Remedy
The battery charger is unable to charge the battery.	Check the battery charger and the battery.

186 EXTERNAL FAULT

Cause	Remedy
Fault from input.	Check cable and/or external unit.

187 DOUBLE ADDRESS ON LOOP

Cause	Remedy
Check the offending units against drawings.	Set correct addresses for the units, with the DIP-switches.

188 LOST CAPABILITY TO DETECT EARTH FAULT

Cause	Remedy
Hardware fault.	Exchange the unit.

Cable break

No answer from any loop unit

- The cable is broken before the first loop unit on a single ended loop.
- The cable is broken before the first loop unit at least once and it is also broken after the last loop unit, if the loop is a double ended loop.

Loop units are answering

- Look for the last loop unit answering on each side of the loop. The cable break is situated after or between these units.

Earth fault

- Check the earth fault circuit, change it if it is faulty.
- If the circuit is working properly, check the loops one by one.
- Disconnect the loops one by one, see Disconnection, Electric isolation of a loop.

Short circuit

No answer from any loop unit

- Search for the short circuit between the central unit and the short circuit isolator.

Loop units are answering

- Search for the short circuit between the short circuits reporting the faults.

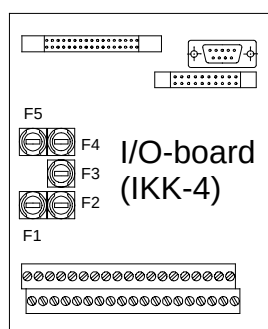
Proceed as follows to locate an earth fault. Divide the cable in two halves and locate the earth fault on one of the halves. Thereafter divide this part of the cable into two halves. Continue dividing the cable into halves until the earth fault has been found. If you are using a multimeter use the diode tester range.

Fuses

Check the fuses on the boards included in the system. The fuses are mounted on the front panels on the following boards: ARK-2, GSK-2, INK-2, KPK-4, LPK-2, RS232K-2, SPK-2 and UTK-2. The fuses to the IKK-4 are mounted on the board itself.

Fault code	Board	Fuse	Fuse rating	
81	CSS3300	2A5 Net fuse	5 AT	5x20 mm
81	CSS3300	2A5 Net fuse	5 AT	5x20 mm
83	ARK-2	F1: Output 24 VDC 1+	2A	5x20 mm
83	ARK-2	F2: Output 24 VDC 1-	2A	5x20 mm
83	ARK-2	F3: Output 24 VDC 2+	2A	5x20 mm
83	ARK-2	F4: Output 24 VDC 2-	2A	5x20 mm
83	GSK-2	Main fuse	2AT	5x20 mm
83	INK-2	Main fuse	250 mA	5x20 mm
83	KPK-2	Main fuse	250 mA	5x20 mm
83	LPK-2	Main fuse *	250 mA	5x20 mm
83	RS232K-2	Main fuse	250 mA	5x20 mm
83	SPK-2	Main fuse	1AT	5x20 mm
83	UTK-2	Main fuse	250 mA	5x20 mm
93	ARK-2	F5: Alarm bell output 1+	2A	5x20 mm
93	ARK-2	F6: Alarm bell output 1-	2A	5x20 mm
93	ARK-2	F7: Alarm bell output 2+	2A	5x20 mm
93	ARK-2	F8: Alarm bell output 2-	2A	5x20 mm
93	ARK-2	F9: Alarm bell output 3-	2A	5x20 mm
93	ARK-2	F10: Alarm bell output 3+	2A	5x20 mm
93	CSS3300	F4: Battery fuse	10AT	6,3x32 mm
93	CSS3300	F5: Battery fuse	10AT	6,3x32 mm
Not supervised	ARK-2	F11: Relay output RL1	2A	5x20 mm
Not supervised	ARK-2	F12: Relay output RL2	2A	5x20 mm
Not supervised	ARK-2	F13: Relay output RL3	2A	5x20 mm
Not supervised	ARK-2	F14: GA-output	2A	5x20 mm
Not supervised	IKK-4	F1: Control unit panel	500 mA	5x20 mm
Not supervised	IKK-4	F2: Main fuse	100 mA	5x20 mm
Not supervised	IKK-4	F3: Main fuse for F4-F5	500 mA	5x20 mm
Not supervised	IKK-4	F4: Power supply ext. device	315 mA	5x20 mm
Not supervised	IKK-4	F5: Power supply	315 mA	5x20 mm

* The central unit is not working properly. Indicator No. 1 (green) is not lit.



Fault code	Board	Fuse	Fuse rating
IKK-4	F1	GPK-4	500 mA
IKK-4	F2	IKK-4 board	100 mA
IKK-4	F3	Output devices	500 mA
IKK-4	F4	Voltage output	315 mA
IKK-4	F5	Voltage output	315 mA