# Technical Description

# VIPCOS 910 Uk0 Gateway

# L. No. 704100


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**Translation of the German original**

# Inhalt

# 1. Legends and Agreements

**Danger!**

This sign refers to an extremely dangerous situation that, unless avoided, may cause serious injury or even death by electric shock.

**Caution!**

This sign refers to an potentially dangerous situation that, unless avoided, may cause a device to be damaged by ESD.

**Caution!**

This sign refers to an potentially dangerous situation that, unless avoided, may cause light injuries or serious material damage.

| | |
|---|---|
| “Commands and entries“ | In this document, all commands and entries that need to be entered from a user’s keyboard are enclosed by inverted commas. |
| `Texts and messages` | All texts and messages that appear on-screen are displayed in the `Courier New` font. |
| ‘ ’ | All spaces (empty fields) that appear on-screen in this document are displayed like this. |

## 2. Overview

The VIPCOS Uk0 Gateway following also called *Gateway* can be used as an adapter / interface to connect digital Uk0 call stations to the decentralized VIPCOS communication system / Network. It enables users to connect a maximum of four Uk0 call stations for each balanced line (shielded twisted pair), including power supply.

The Uk0 call station for digital weather-proof and explosion-proof call stations is in conformity with the required maximum cable length of 3,5 km.

In addition, each Gateway has two Ethernet ports to ensure redundant network.

The VIPCOS UK0 adapter is usually supplied with an operating voltage of 48V DC.

## 3. Design

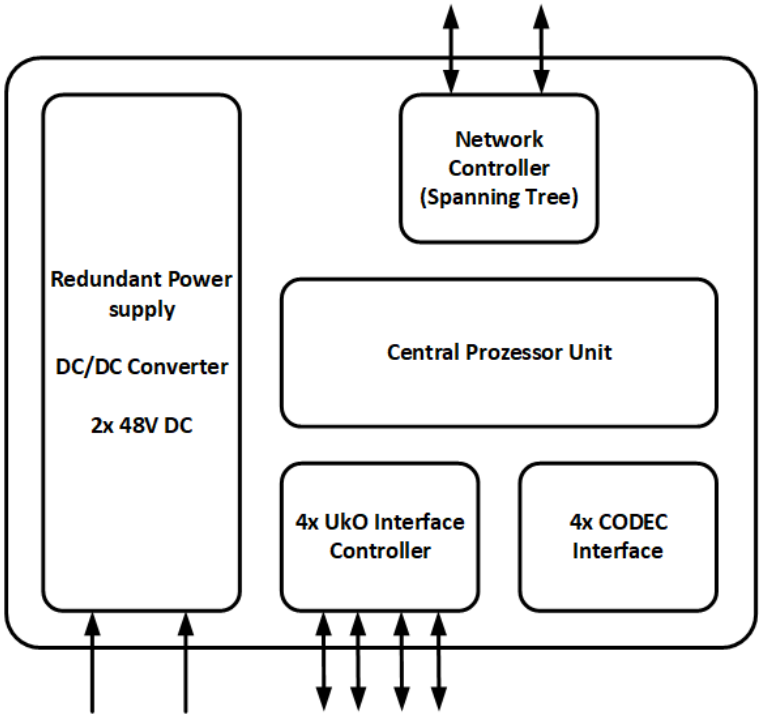
### 3.1 Overview

The VIPCOS Uk0 Gateway is integrated in a 19“subrack in conformity with DIN IEC 60297-3. The size of module is 3 HU for height and 8 MU for width.

The front plate contains two Ethernet connectors, as well as 14 LEDs.

To connect Uk0 call stations, two RJ45 jacks are attached to the front side. In addition, the rear side provides two two-way contacts for information of faults, four fuses as well as the connector for power supply.

### 3.2 Block Diagramm



## 4. Facility

- IP-Adapter for digital call stations
- 2x RJ45 Jack with Rapid Spanning Tree
- Full Configurable over Web interface
- Operating voltage monitoring of the UK0-Adapter
- Operating voltage monitoring of the call station energizing
- Fuse monitoring
- Temperature monitoring
- Watchdog
- 2 two-way contacts for fault indication
- Separately configurable operating mode for each component port

## 5. Transportation and storage

Proper operation of the device requires both appropriate transport in transport packaging and appropriate storage conditions.
For storage of device observe the permitted climatic conditions and the permitted operable temperature range!

## 6. Assembly

The device is designed for installation in 19 " frames in accordance with the IEC 60297- 1 norm. It should be used indoors with well ventilation or air-conditioning. The space required is three height unit (3 HU). When installing the frame in a cabinet, an efficient cabinet ventilator is compulsory so that the heat that has developed in the cabinet can be channeled outside.

# 7. Functionality

## 7.1 Overview

In order to connect non-IP-based call stations to the VIPCOS system in a decentralized manner, a transition to the network must be set up via an appropriate network connection.

There is no direct IP connection to a UK0 intercom via the gateway. Conventional connection technology should therefore be used for weather and explosion-proof call stations in order to take into account the required cable length. The UK0 interface technology enables distances of up to 3.5 kilometers to be bridged.

The functions of the connected UK0 microphone units are identical to those of the IP call stations. The configuration takes place via the web interface of the Uk0 gateway.

## 7.2 Components that can be connected

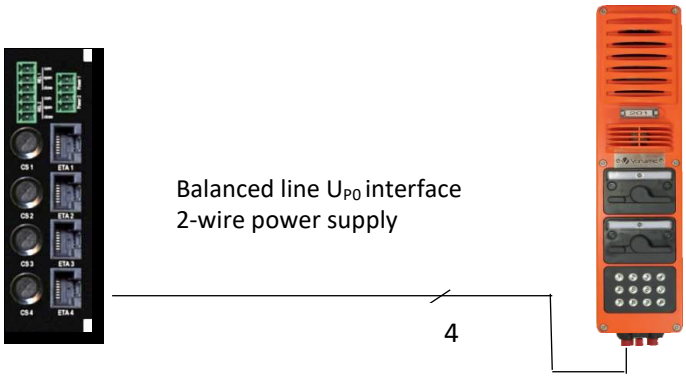
The basic function is connecting digital call stations for intercom operation. Weatherproof and explosion-proof digital UK0 intercom stations can be connected.

In addition to voice and data connection via the UK0 interface, there is the possibility of extracting power directly from the VIPCOS UK0 Adapter.

Phantom connection is possible for all UK0 call stations.

*Please note using phantom connection the $U_{po}$ cable length (for 1,5mmØ) is reduced to approx. 1 km.

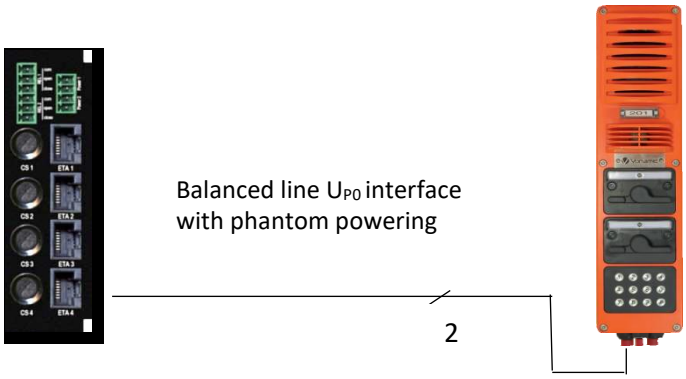
**a) Normal powering**




**b) Phantom powering**

PLEASE NOTE that for phantom powering you need to make ABSOLUTELY sure that the correct polarity is used!

Uk0/A = +48VDC
Uk0/B = 0VDC




## 7.3 Additional amplifiers for call stations

Intercom stations that are used with additional amplifiers require more power. This additional required amount of energy must be taken into account for the power supply through the VIPCOS UK0 adapter. A local power supply or the use of separate supply lines with a sufficient cross-section to use the additional power is strongly recommended.

## 7.4 Failure relais

### 7.4.1 HSK (REL 1)

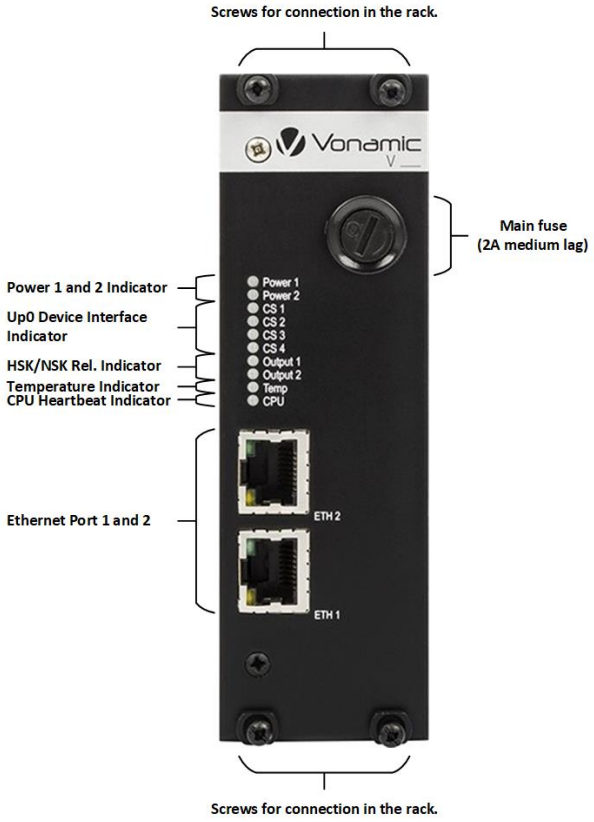
Main fault indicator contact. If there is a failure affecting the entire device, the HSK relay will deactivate and the HSK N.C. contact will be closed.
This will be signalized by Output 1 light-emitting diode.
The type of error is output as a 4-digit error code as a recurring multicast string and can be translated directly into plain text and displayed with the V410 monitoring software. (see device error codes).

### 7.4.2 NSK (REL 2)

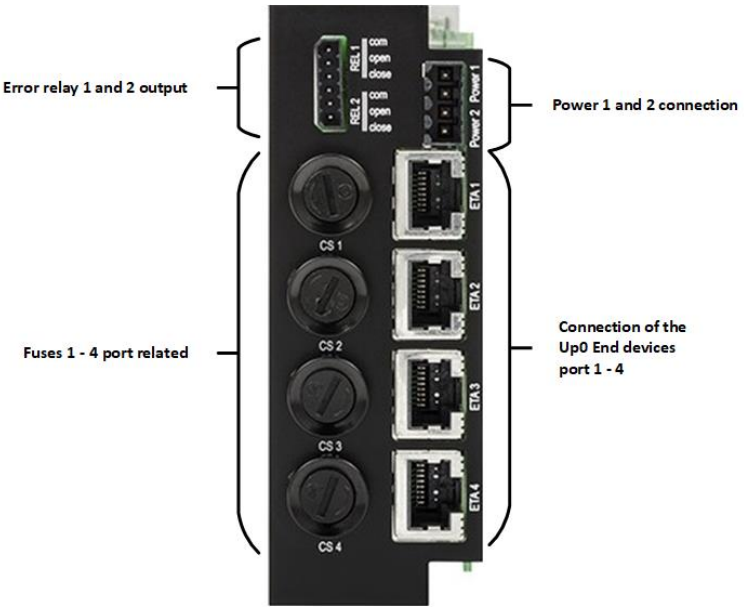
Sub fault indicator contact. If there is a failure affecting one or more subscribers, the NSK relay will deactivate and the NSK N.C. contact will be closed.
This will be displayed by Output 2 light-emitting diodes.
The type of error is output as a 4-digit error code as a recurring multicast string and can be translated directly into plain text and displayed with the V410 monitoring software. (see device error codes).

# 8. Interfaces

## 8.1 Front side interfaces

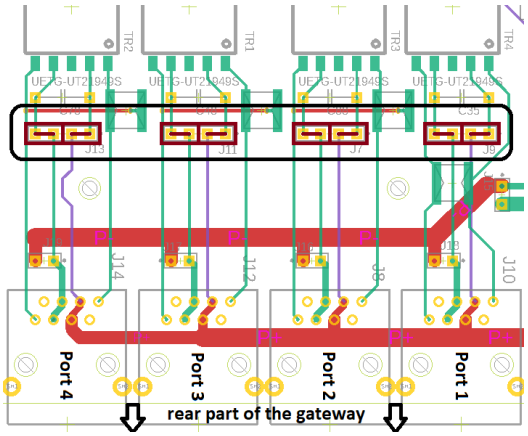



## Rear side interfaces



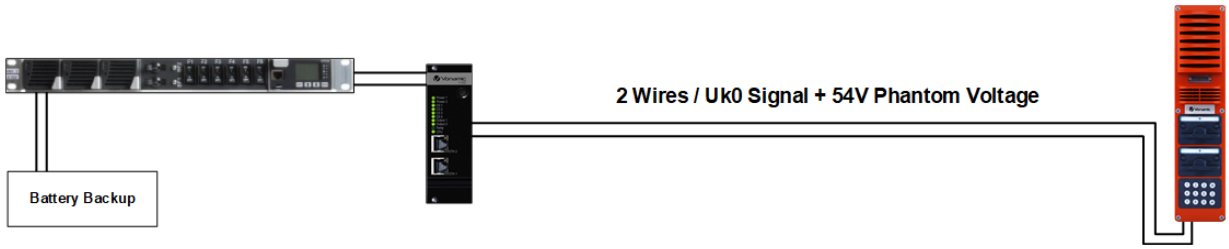

Power supply for end devices

The phantom power supply of the call stations is activated by default with two jumpers per port. If no power supply by means of phantom power via the 2-wire Uk0 technology is desired, the corresponding jumpers on the port must be removed



Power supply example 1:

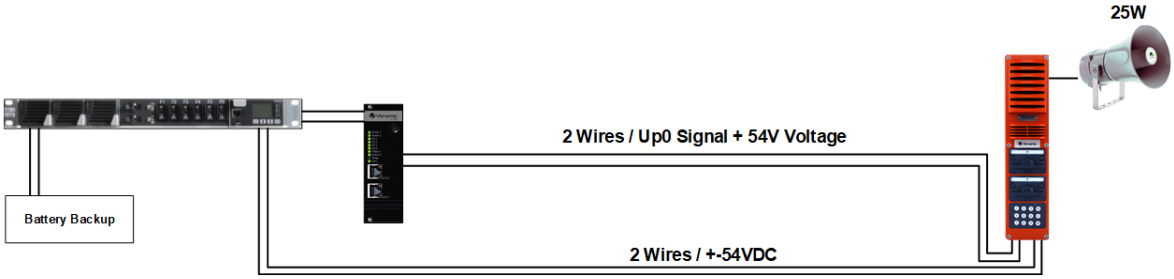
Use of the supply voltage shared by the V910 Uk0 Gateway and the Callstation units.




In this mode, the cable length between the call station and the gateway can be up to 7 km. In this operating mode, the power transmission is not sufficient to operate the 25W additional amplifier.

Power supply example 2:

Using two separate supply voltages for the V910 Uk0 Gateway and the call stations.




Use of two separate supply voltages for the call station and the 25W additional amplifier. In this mode, the 25W additional amplifier can be used if it was available when the gateway was started, and it offers cable redundancy for the power supply. (The power supply can also be done locally)

# 9. Commissioning

**Warning!**

**The device may be damaged by starting it in an inappropriate way!** Starting the device in an inappropriate way or using defective or faulty tools may result in considerable material damage.

- The device may be started only by qualified personnel authorized by the manufacturer.
- Make sure to check the wiring before starting the device.
- Note that the temperature inside the device must become adapted to the ambient temperature inside the engineering room before the device is started.

Switch off the supply voltage. Connect all digital components. If the device is part of a system designed by the manufacturer, all configurations are included in the scope of delivery.

Otherwise, configure the device via the web interface using a PC. To configure the VIPCOS system, one of the two network interfaces of the device must be connected locally to the network interface of the service PC. In the case of a direct connection, please check whether your PC has the auto crossing function. Otherwise, you will need either a switch or a crossover patch cable.

The PC must either have a standard browser or a programming tool for VIPCOS. We recommend the VIPCOS configuration website accessible with standard browser. With this user interface you can configure and maintain VIPCOS systems.

Switch on the supply voltage.

This starts the gateway by activating its own initialization phase. In this the Power 1 LED shows a steady green light and the green LEDs of the two RJ45 ports on the front light up alternately. As soon as the CPU is ready, this is indicated by the blinking of the CPU LED. (Heartbeat) The initialization of the internal switch is also completed and the green LEDs of the front RJ45 ports turn off or indicate the link to a network. The relays Rel1 and Rel2 are activated. At the same time, the four terminal device ports are initialized. This is indicated on the connected terminal device by all button LEDs flashing. As soon as the end device initialization is completed, this is indicated in the gateway by a green continuous light of the corresponding port LED. The flashing phase ends in the end device and the device can thus be reached via the configured ID in the VIPCOS network.

If a fault is detected, it is indicated by the failure relay dropping out, the corresponding front LEDs for Rel1 or 2 become active and the gateway sends a corresponding message to the network for evaluation.

Before you connect several gateways to each other via the VIPCOS network, you have to change their IP addresses. It is therefore recommended to document the assignment between the device number, IP address and the associated MAC address.

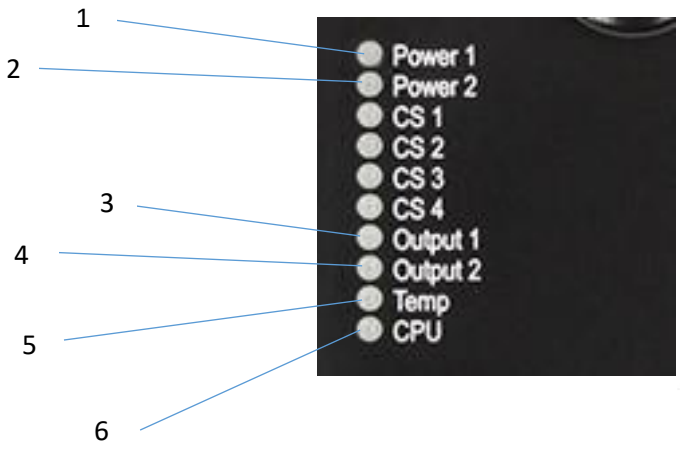
If necessary, start the configuration here.

# 10. Displays

## 10.1 Front-side displays

Optic display elements providing information about the device's current condition are located on the front-side.

### 10.1.1 General displays




| | | |
|---|---|---|
| 1. | Power 1 | Lights up permanently green as soon as the power supply with Power 1 is established. |
| 2. | Power 2 | Flashes red as soon as the previously existing power supply with Power 2 is interrupted. |
| 3. | Output 1 | Lights up red for the duration of a main fault in the gateway. (Except in the event of a general power failure of both supply voltages 1 & 2) |
| 4. | Output 2 | Lights up red for the duration of a secondary fault in the gateway. (Except in the event of a general power failure of both supply voltages 1 & 2) |
| 5. | Temp | Flashes red if the gateway overheats. |
| 6. | CPU | Flashes green when the CPU is working normally. (Heartbeat) |

### a. Displays of the 4 Uk0 Ports


These LEDs signal the following state notifications:

1. Lights up green when an Uk0 Callstation has successfully completed the initialization phase at the corresponding port.
2. Lights up red when an Uk0 terminal device has lost the connection to the gateway at the corresponding port.

* The last status is overwritten when the gateway is booted.

### b. Network interfaces

Green = indicates the link to a network and flashes when data is being exchanged.

Yellow = inactive

## 11. Failure indication

a. Failure displays of the complete device


1. Power 2 — This LED shows a red steady light when the gateway is operated with secundary power 2 supply and the primary supply at Power 1 fails.

2. Output 1 — This LED lights up red for the period in which the gateway indicates a major error. The corresponding error code is output as a multicast stream and can be displayed in plain text using the V410 monitoring software.

3. Output 2 — This LED lights up red for the period in which the gateway displays a secondary error. The corresponding error code is output as a multicast stream and can be displayed in plain text using the V410 monitoring software.

4. Temp — In the event of a warning that the temperature is approaching the permitted value, this LED flashes. When the permissible temperature has been reached, this LED lights up continuously. If the permissible temperature is exceeded, the gateway is switched to standby mode for self-protection. As soon as the permissible temperature is reached again, the gateway starts automatically.

5. CPU — This LED flashes continuously to indicate correct operation of the CPU and firmware. If there is no heartbeat, there could be a defect. First try to restart the gateway.

The following overview lists the error codes that can be detected by the V910 gateway and sent to the network. At the same time, the LEDs for port 1-4 and Rel1-2 signal the corresponding error. These error messages cannot be suppressed.

| Error description | Error No. | V910 | UK0 via V900 |
|---|---|---|---|
| Link Port 1 Error | 1106 | x | |
| Link Port 2 Error | 1201 | x | |
| SIP Proxy Registration Error | 1202 | | x |
| Temperature Warning | 1203 | x | |
| Temperature Error | 1109 | x | |
| Temp. Sensor Error | 1110 | x | |
| Memory Error | 1111 | x | |
| Voltage Error | 1208 | x | |
| Device Monitor UK0 Port 1 | 1209 | | x |
| Device Monitor UK0 Port 2 | 1210 | | x |
| Device Monitor UK0 Port 3 | 1211 | | x |
| Device Monitor UK0 Port 4 | 1212 | | x |
| Config file Error | 1213 | x | |
| Web Config Error | 1214 | x | |
| Relais 1 Main | 1113 | x | |
| Relais 2 secondary | 1223 | x | |

The error codes can be displayed either with a network analysis software (e.g. Wireshark) or via Vonamic's V410 monitoring software, translated into plain text and graphically assigned to a participant and its location.

## b. Trouble shoot

The following chapter describes the typical procedure for the respective fault display related to the V910 Uk0 Gateway.

**Danger!**
**Risk of death by electric shock!**

There is risk of death if live parts are touched. Switched on mains power supply during correcting failures may result in death or serious injury.

Works on switched on systems shall be performed by qualified and certified electricians or personnel authorized by the manufacturer only.

Keep away from the mains power supply 230VAC.

**Caution!**
**The device may be damaged by correcting failures in an inappropriate way!**

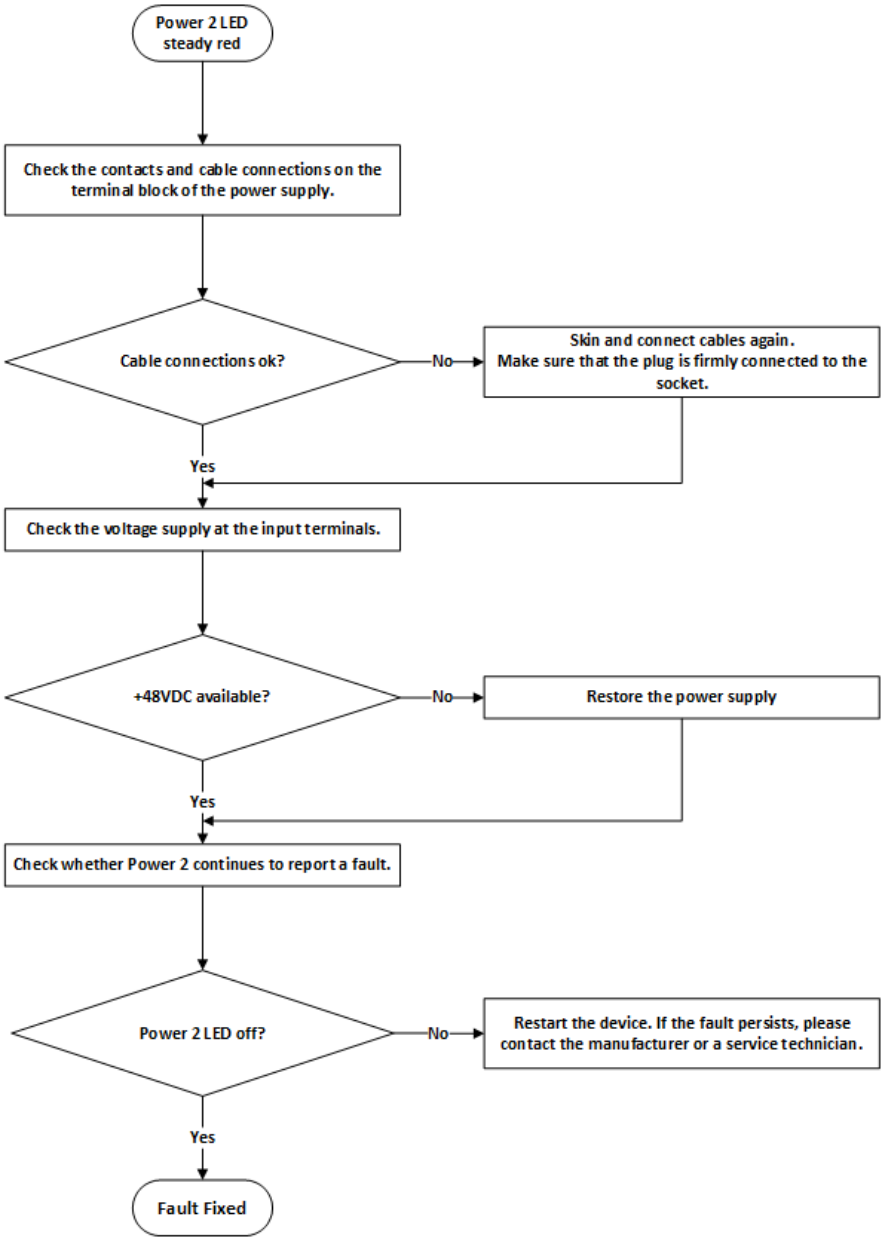
Correcting failures of the device in an inappropriate way or using defective or faulty tools may result in considerable material damage.

- Correcting failures shall be performed by qualified and certified electricians or personnel authorized by the manufacturer only.
- Use spare parts recommended or delivered by manufacturer only.
- Use commercially available measurement equipment only.

Error display on the gateway front

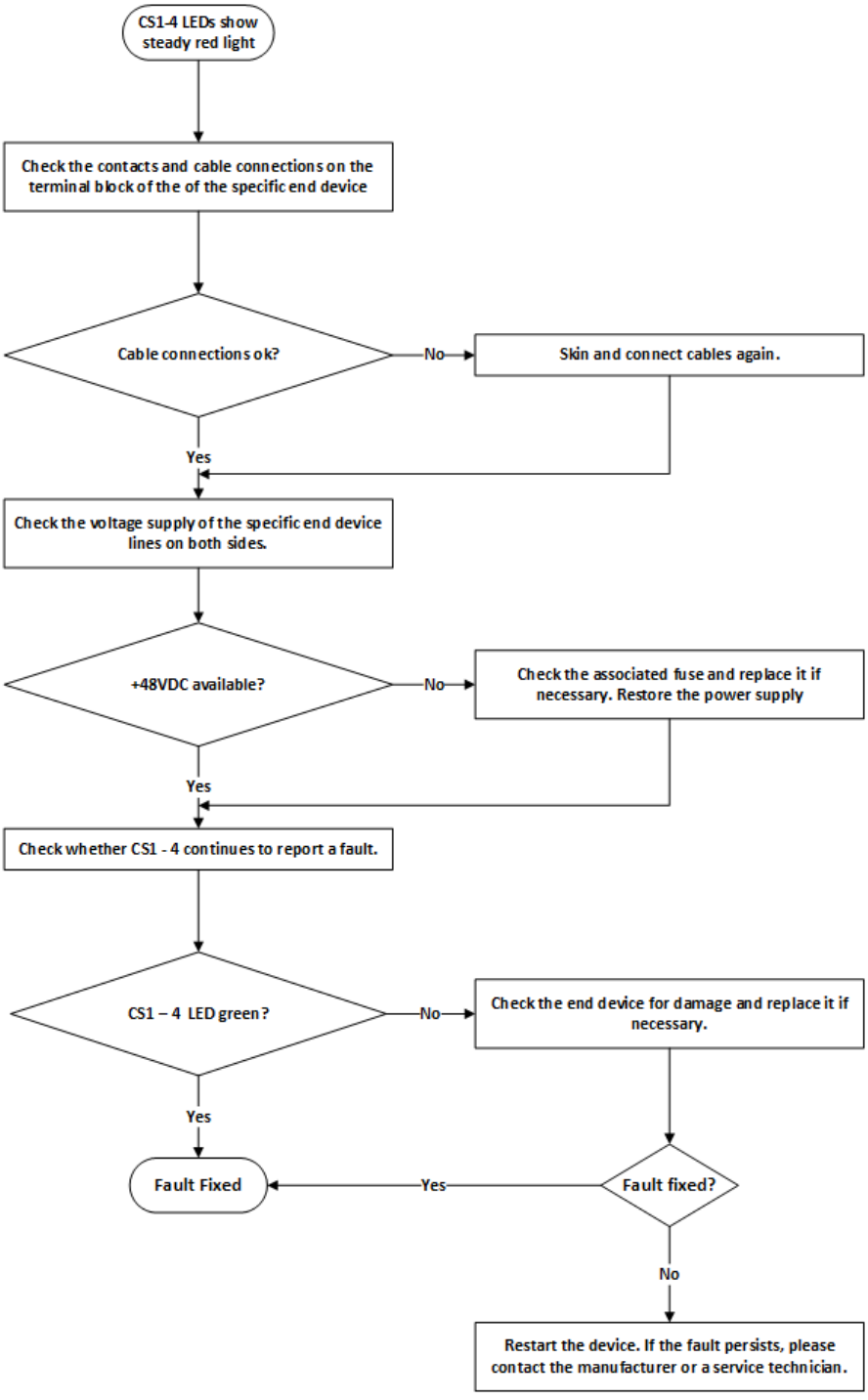
## i. Power 2


-0VDC
+48VDC

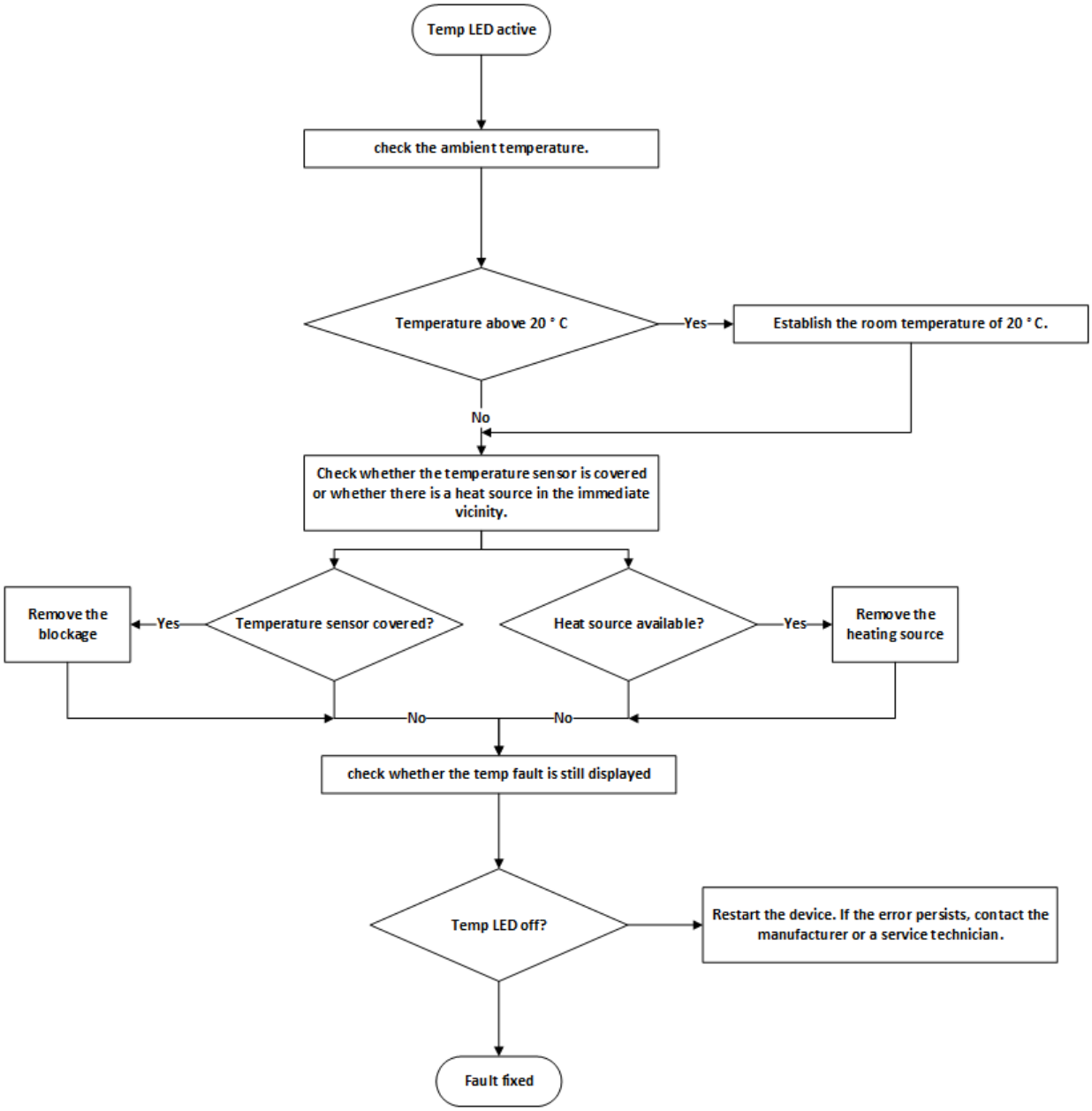

Power 2 LED steady red
Check the contacts and cable connections on the terminal block of the power supply.
Cable connections ok?
No
Skin and connect cables again. Make sure that the plug is firmly connected to the socket.
Yes
Check the voltage supply at the input terminals.
+48VDC available?
No
Restore the power supply
Yes
Check whether Power 2 continues to report a fault.
Power 2 LED off?
No
Restart the device. If the fault persists, please contact the manufacturer or a service technician.
Yes
Fault Fixed

### ii. CS1 – 4


REL1
REL2
com
open
close
Power 1
Power 2
ETH 1
ETH 2
ETH 3
ETH 4
CS 1
CS 2
CS 3
CS 4


CS1-4 LEDs show steady red light
Check the contacts and cable connections on the terminal block of the of the specific end device
Cable connections ok?
No
Skin and connect cables again.
Yes
Check the voltage supply of the specific end device lines on both sides.
+48VDC available?
No
Check the associated fuse and replace it if necessary. Restore the power supply
Yes
Check whether CS1 - 4 continues to report a fault.
CS1 – 4 LED green?
No
Check the end device for damage and replace it if necessary.
Yes
Fault Fixed
Yes
Fault fixed?
No
Restart the device. If the fault persists, please contact the manufacturer or a service technician.

iii. Temp


Temp LED active
check the ambient temperature.
Temperature above 20 ° C
Yes
Establish the room temperature of 20 ° C.
No
Check whether the temperature sensor is covered or whether there is a heat source in the immediate vicinity.
Remove the blockage
Yes
Temperature sensor covered?
Heat source available?
Yes
Remove the heating source
No
No
check whether the temp fault is still displayed
Temp LED off?
Restart the device. If the error persists, contact the manufacturer or a service technician.
Fault fixed

## 12. Configuration

**Caution!**
**Risk of damaging the device by configuring it in an inappropriate way!**
Configuring the device in an inappropriate way or using defective or faulty tools may result in considerable material damage.

- The device may be configured only by personnel authorized by the manufacturer.
- Use only laptops or potential-free PCs with ungrounded power supply (protection class 2) to configure the device.
- Make sure to use only standard cables.

The configuration takes place via a standard web browser or the configuration software. You can find detailed configuration instructions in the document: "V900 - Configuration Web Interface".

## 13 Maintenance

Operating the device does not require observing a maintenance plan.

## 14 Technical Data

| | |
|---|---|
| Network: | 2x Ethernet 100 Base-T |
| Operating nominal voltage: | 48V DC redundant |
| Power input for 48V DC without call station energizing current: | approx. 50mA |
| Call station energizing current with normally connection: | approx. 60mA |
| Call station energizing current with phantom connection: | max. 120mA per call station |
| Cable lengths for UK0 interfaces: | max. 500m balanced line (unshielded twisted pair) 1mmØ |
| | max. 7km balanced line (shielded twisted pair) 2,5mmØ |
| Cable lengths for UK0 interfaces with phantom powering: | max. 1km balanced line (shielded twisted pair) 1,5mm Ø |
| Power: | max. 15W |
| Operating system: | VIPCOS |
| Frequency range: | 100 Hz – 16 kHz |
| Line coding: | 2B1Q |
| Communication protocols: | Uk0, IPv4, TCP/UDP, ARP, RTP/RTCP, RTP/RTCP, DHCP, ICMP, SIP (STUN), http, VIPCOS |
| Audio Codec 1: | G.711 alaw |
| Frequency: | G.711 alaw, 300 – 3400Hz |
| Audio Codec 2: | PCM 16 |
| Frequency: | 300 – 16.000Hz |
| Admissible temperature range: | -25°C - +70°C |
| Protection class: | IP20 in conformity with DIN EN 60529 |
| Measurements: | 187 x 128 x 40mm |
| Housing: | 1,5mm coated aluminum |
| Colour: | Black (RAL 9005) |
| Weight: | 0,6 kg |