Technical Description

VIPCOS 590 Smart Audio Controller

L. No. 10294 (old: 702590)

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Translation of the German original

Subject to technical modifications

Contents

1. Legends and Agreements

Danger!

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

Caution!

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

Notice!

This sign refers to a potentially dangerous situation that, unless avoided, may cause 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.
See *Overview*	All refers to chapters or figures of this description are displayed in *cursive.*

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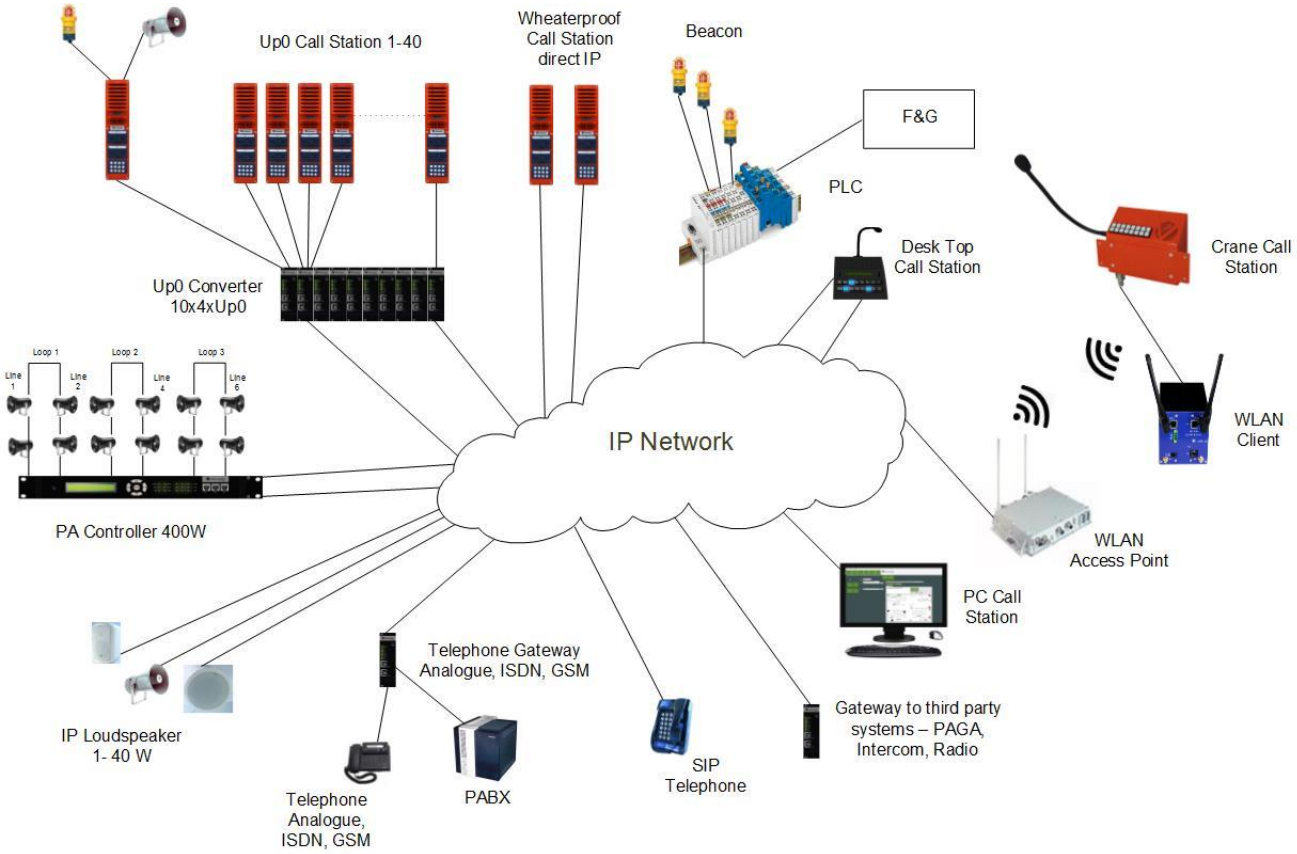
2. Overview

The VIPCOS V590 Smart Audio Controller can be used as a participant for the VIPCOS decentralized communication system. The VIPCOS V590 Smart Audio Controller enables direct voice communication with other VIPCOS and third-party devices. It can also be used for loudspeaker announcements and even for programmable local functions. A microphone and loudspeaker monitoring is also onboard, as is an up to 40W power amplifier. The model described on these pages has 6 inputs and 1 output. A typical application for this device is the installation in loudspeakers to make it IP capable. This is made possible by the small form factor, operation via PoE and fanless operation. This means that both the amplifier and the network receiving unit are built into the loudspeaker. Vonamic has thus managed to set up the sound system in a decentralized manner. A central 100V amplifier with long and expensive cable runs is no longer required.

In addition to target keys for WL/EL, Fullduplex and SIP, the Smart Audio Controller has voice memory and is full configurable with its Web interface. Depending on the configuration used, it enables you to control functions such as:

3. Application

The VIPCOS 590 Smart Audio Controller is used in VIPCOS systems or can be integrated in nearly every SIP (Session Initiation Protocol) System. This device is direct connectable to a VIPCOS network node. Switches with Power over Ethernet and IGMP function are recommended to supply connected devices and, in this case, the VIPCOS 590 Smart Audio Controller.



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4. Design

The VIPCOS 590 Smart Audio Controller consists of a compact circuit board with the dimensions WxLxH 7.7 x 10.5 x 2.1 cm. 4 mounting holes are provided on the edge of the board for installation in possible housings or top hat rail brackets. 6 inputs and one output were designed to trigger various functions. The onboard 40W Class D amplifier achieves its full performance with PoE + or external 24VDC. Two LEDs indicate the status of the power supply and the CPU clock (heartbeat).

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

Notice!

The device is designed for indoor use only and must be protected against cold and moisture.

6.1 Connection to a net node

The following examples are all based on the assumption that in the VIPCOS network there is some sort of structured cabling in accordance with the requirements of DIN EN 50173 or ISO/IEC 11801. All switches, adapters, gateways, extenders and modems in the network should have auto crossover and IGMP functionality. Otherwise, the using of crossover cables instead of standard patch cables are required.

More information about VIPCOS system is to find in the system description VIPCOS. This document will be delivered with each system.

The standard way of connecting the VIPCOS 590 Smart Audio Controller to a VIPCOS network node, using shorter cables of up to 100 meters (measured from the V640 Intercom Call Station connector to the network node connector), is by means of Power over Ethernet, subsequently referred to as PoE.

7. Transportation and Storage

Proper operation of the device requires both appropriate transport in transport packaging and appropriate storage conditions.

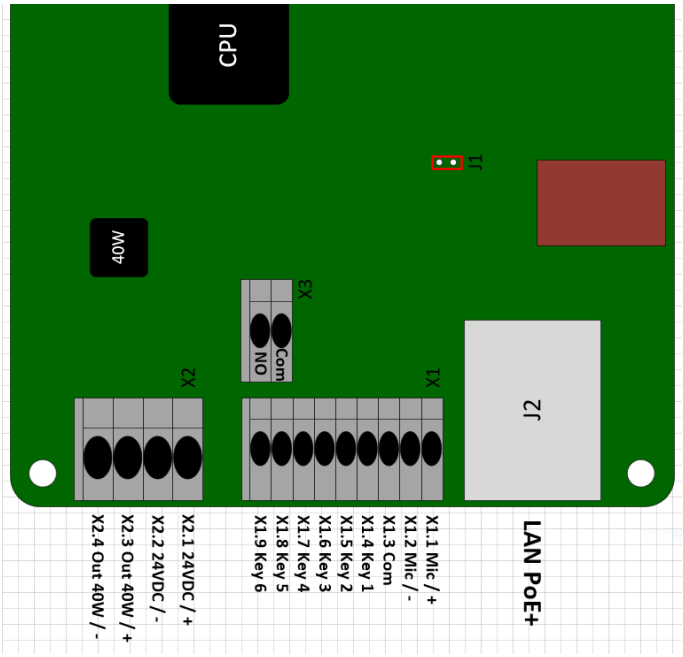
For storage of device observe the permitted climatic conditions and the permitted operable temperature range!

8. Scope of delivery

Note that no extra individual parts are included in delivery.

9. Interfaces and Terminals

The following items are located on the device:



Term.	Design.	Pin	Detail designation
X1	Mic / +	1	Microphone connector
	Mic / -	2	Microphone connector
	COM	3	Common Key Connection
	Key 1	4	Short circuit with Common presses key 1
	Key 2	5	Short circuit with Common presses key 2
	Key 3	6	Short circuit with Common presses key 3
	Key 4	7	Short circuit with Common presses key 4
	Key 5	8	Short circuit with Common presses key 5
	Key 6	9	Short circuit with Common presses key 6
X2	24VDC/+	1	Supply voltage and supply of the 40 W Class D amplifier
	24VDC/-	2	Supply voltage and supply of the 40 W Class D amplifier
	Out 40W/+	3	amplifier output 10W with PoE, 40W with PoE+ / External 24VDC
	Out 40W/-	4	amplifier output 10W with PoE, 40W with PoE+ / External 24VDC
X3	COM	1	Digital Output / Contact Data 200VDC or PEAK AC, 0,5 (1A Carry) ADC or PEAK AC
	NO	2	Digital Output / Contact Data 200VDC or PEAK AC, 0,5 (1A Carry) ADC or PEAK AC
J1	Mic / Mode	1	Jumper for selecting microphone type. Present = electret, removed = dynamic
	Mic / Mode	2	Jumper for selecting microphone type. Present = electret, removed = dynamic
J2	ETH / PoE+	RJ45	Network connection and power supply

10. Commissioning

Every device that leaves the production site receives a standard checklist with a static IP address (192.168.100.10). The controller can be operated with 24VDC, PoE + or PoE (10W amp. Power). As soon as one of the power supplies is established, the boot process, which lasts about 10 seconds, starts. The activation of the power supply is indicated by the continuous light of the Power LED. The CPU LED shows that the firmware is starting with double flashes per cycle.

The initialization is finished as soon as the CPU LED flashes.

11. Configuration

For use in a VIPCOS system, the V590 must be configured with the appropriate data. The controller is configured via the IP network with a standard Internet browser in order to visit the configuration website of the device, or with the VIPCOS Configuration software (reference number 701200). The implemented user interface is clearly structured.

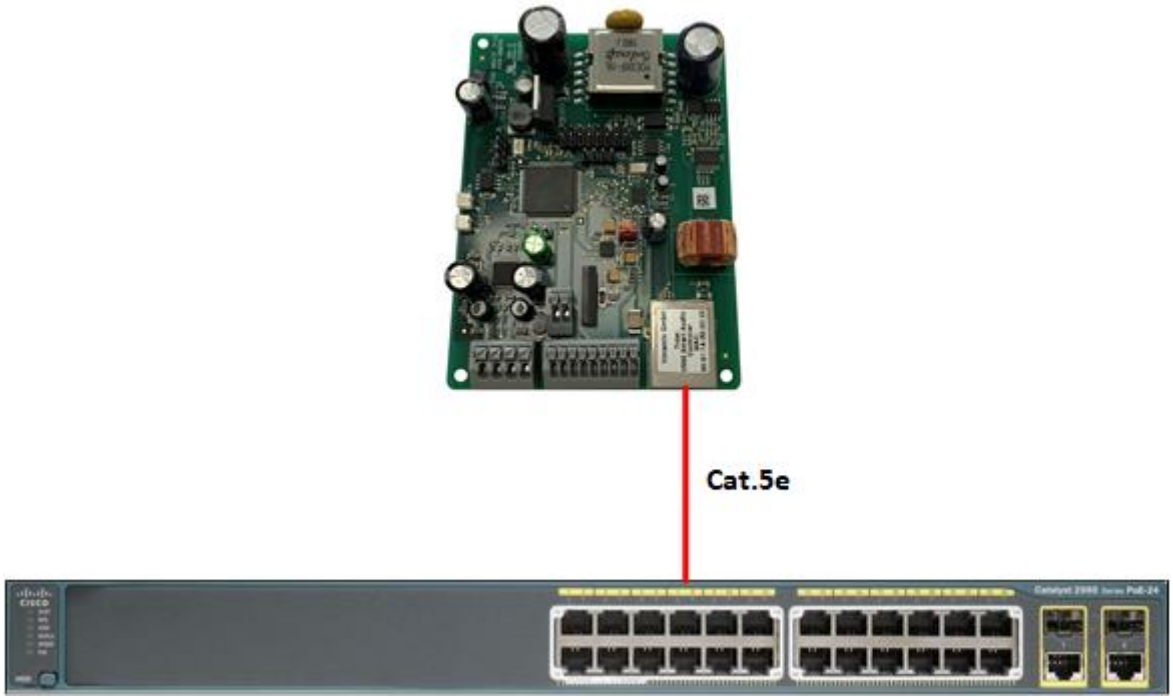
For detailed information on configuration via the web interface, please refer to the document ***"V590 - Configuration Web Interface"***

12. Functionality

12.1 Overview

The V590 Smart Audio Controller is part of the innovative VIPCOS system, which differs from other conventional intercom systems through its "decentralized IP intelligence". Since the operation software is located within the Controller, it can act independently and communicate without a central operator.

To do this, the intercom is connected to an IP-compliant Ethernet system directly via the switch with a Cat 5 cable.



12.2 Local Functions

Local functions only affect one call station. They have no influence on other call station. This allows you to make local announcements via the connected microphone to your own 40W amplifier output or to trigger events via the relay output.

12.2.1 Megafon

This function allows you to make local announcements using the device's own microphone and loudspeaker. This serves to amplify your own voice as you know it from a megaphone. This makes it possible, for example, to support the coordination of employees at collection points.

12.2.2 Relais

The relay can be used to enable a wide range of local functions. With the relay function "Answer", the output relay is activated with every keystroke that would create an outgoing connection, even if no other VIPCOS devices are connected. This makes it possible, for example, to control locally connected third party systems such as gates and doors, video systems, PLC's, etc. by means of a local keystroke.

12.3 WL destination keys

12.3.1 Simplex/Fullduplex intercommunication connections (WL / Fullduplex)

WL connections are two-way or full-duplex connections between two or more call stations. These connections are controlled by a button via a loudspeaker and a microphone. The device has digital echo cancellation, which avoids feedback during full-duplex connections.

To establish a voice connection with any user, simply connect the COM to the key assigned to that user. After that, the user can be addressed immediately. It is important that you keep the connection to the COM while you are speaking. Disconnect the COM connection when you are finished! This will end the conversation and return the device to standby.

12.3.2 Loudspeaker announcements (EL)

The procedure for loudspeaker announcements is the same as for fullduplex voice connections. Simply establish a connection with COM and the corresponding key and speak. Pressing the key establishes a connection to a loudspeaker or loudspeaker circuit. This one-way connection remains until the connection to COM is disconnected.

12.3.3 Group call

With a group call, several subscribers or loudspeaker circuits are combined to form a predefined group. The connection is established as usual by pressing a key and remains until this key is released. Intercom stations or loudspeaker circuits that are switched on are normally not interrupted according to the priority.

The target stations show a flashing light in the associated diodes as usual. In the case of the two involved microphone units, all other microphone units receive a continuous light as a busy signal.

12.3.4 Party Line

Party Participants selected by a V640 desktop station in the system can hold a conference call. To talk to all the other participants in the party, you must press and hold the line key on your V590 where the "**Partyline**" function has been preconfigured. The conference will be terminated from the desk phone.

12.3.5 Announcements with Pre-tone

When you press the key with configured Pre-tone, a connection to another call station will be established and the Pre-tone replayed, after which you may speak to the selected call station. Cancel the connection by releasing the key.

Announcements can also be sent either to a selected group or as a collective call. After you've pressed the Group Call or the Collective Call key with configured Pre-tone, a connection to the pre-defined group / to all target call stations will be established and the Pre-tone replayed. Now you can make an announcement to the selected target group. To finish the call, simply release the key.

12.3.6 Triggering an alarm

By briefly pressing this key (for example, "**Alarm**"), you can send an alarm sound to all loudspeaker circuits of a selected group.

By pressing another key (for example, "**All call Alarm**"), you can make any number of announcements during an ongoing evacuation alarm. Remember to keep the key pressed while speaking. The alarm will be interrupted for the duration of the announcement, and will afterwards be resumed (i.e., as soon as the key is released).

The alarm will continue until it is cancelled by pressing a pre-defined key (for example, "**Alarm Cancellation** ").

12.3.7 Signaling calls when a key is pressed

There is a potential-free contact that can be configured as indicator for Call Connections In/Out, SIP online status or operation monitor. It can handle carry currents up to 1A at 200VAC/DC.

12.4 Functions without assigned keys

12.4.1 Priorities

All connections and functions are given a defined priority. If the priorities are set, then busy connections or functions can only be interrupted by connections or functions of a higher priority. Connections of the same or lower priority are not executed with a busy connection or function. The VIPCOS System allows for 255 priority levels.

12.5 Special functions

12.5.1 Telephony function

Notice!

A VIPCOS SIP server is required for the use of IP telephones in VIPCOS-systems. An appropriate gateway is also required for the connection of analog or ISDN telephones.

Call setup from a telephone subscriber with dial keypad

A telephone subscriber reaches a V590 Smart Audio Controller by dialing the phone number configured in the VIPCOS system via the dial keypad. The connection is established immediately and the telephone subscriber can speak directly. The procedure of the speech connection is the same as for a normal telephone call. The line key must be pressed to activate the internal microphone on the V590 and must not be released until the call is ended. The telephone subscriber can always be heard on the Smart Audio Controller. The intercom subscriber can only be heard if the line key for activating the internal microphone is pressed during an active connection.

A busy signal can be heard on the telephone if the controller has just established an active voice connection. After hanging up and picking up the handset again, the connection setup can be resumed. The call can be terminated by replacing the subscriber's handset or by pressing a " Dial Cancel " key specially configured for operation at the V590 Smart Audio Controller.

The connection will be terminated automatically after a preconfigured time of maximum 90 seconds, if during the connection the correct line key is not pressed, nobody is speaking at the selected destination or after termination of the call a possibly configured " Dial cancel key " has not been pressed.

Call setup from a telephone without a dial keypad or VIPCOS subscriber

Only telephone subscribers who have been assigned a fixed line key on the V590 Smart Audio Controller by configuration in the VIPCOS system can be dialed. To establish the connection, the line key must be pressed briefly. The illuminated line lamp signals that the connection has been established. The telephone is dialed directly and there is an acoustic signal at the telephone. A dial tone is heard on the controller until the telephone subscriber has lifted the handset. After the connection has been established by lifting the handset,

can speak directly as usual and will be heard at the Intercom digital station V615. The speech connection procedure is like a normal telephone call. By pressing and holding the line key, the participants can speak and listen simultaneously. The telephone subscriber can speak immediately after pressing the line key on the controller. The key must remain pressed while speaking and may only be released when speaking is finished. The telephone subscriber can always be heard at the controller.

If the dialed telephone line is busy, a busy signal is heard at the telephone loudspeaker. A second press on the line key at the Intercom digital station V615 terminates the dialing process. Another connection can be established directly by pressing the line key.

The call can be terminated by hanging up the subscriber's telephone handset or by pressing a "Cancel dialing" key specially configured for operation at the Intercom Digital Call Station V615.

The connection is automatically terminated after a preconfigured time of maximum 90 seconds if the correct line key is not pressed during the connection, no one is speaking at the dialed destination or a possibly configured "Cancel dialing" key is not pressed after termination of the call.

13 Maintenance

Operating the device does not require observing a maintenance plan.

14 Reparation

Defective devices may only be repaired by the manufacturer or by personnel authorized by the manufacturer who are familiar with the relevant regulations. Failure to do so will jeopardize the device's certification and void the warranty.

15 Technical Data

V590 Smart Audio Controller

Operating voltage range:		24V DC; PoE+ (54V DC); PoE (54V DC)
Current input	Rest:	≤ 25mA Standby
	Max.:	≤1A (with 40 W amplifier)
Amplifier:		max. 40 W at 8 Ω
Potential-free change over contact:		200 V AC/DC 1 A
Permissible line resistance:		
for current supply		150 Ω at 48 V / 1 W 80 Ω at 48 V / max. modulation
Transmission protocol:		VIPCOS-Protocol Vonamic
Frequency range:		200 Hz ... 16 kHz
Dimensions h x w x d:		108mm x 78mm x 35mm
Ambient temperature range:		-15ºC ... +50ºC
Weight:		ca. 0,35 kg

Internal 40-W amplifier (requires 25V DC or PoE+)

Operating voltage range:		25V DC
Current input	Rest:	10 mA
	Max.:	1 A
Output power:		40 W
Speaker Impedance:		8 Ω
Input voltage:		1 V
Input resistance:		20 kΩ (at 1 kHz)
Frequency range (measured at Ua=25 V DC):		200 Hz ... 16 kHz (-3 dB ±1 dB)
Distortion factor (measured at Ua=54 V DC):		≤ 5%

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Internal 10-W amplifier (If only PoE is available)

Operating voltage range:		PoE (54V DC)
Current input	Rest:	10 mA
	Max.:	900 mA
Output power:		10 W
Output voltage:		8 Ω
Input voltage:		1 V
Input resistance:		20 k Ω (at 1 kHz)
Frequency range (measured at Ua=25 V DC):		200 Hz ... 16 kHz (-3 dB ±1 dB)
Distortion factor (measured at Ua=54 V DC):		≤ 5%

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