



**KAREL** IPV10  
IP PBX

**TECHNICAL REFERENCE  
&  
INSTALLATION GUIDE**

05/06/2012

# TECHNICAL REFERENCE & INSTALLATION GUIDE



## KAREL ELEKTRONİK SANAYİ VE TİCARET A.Ş.

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## R&TTE Declaration of Conformity (DoC)

We, KAREL ELEKTRONİK SANAYİ VE TİCARET A.Ş.  
Kore Şehitleri Caddesi, Yzb. Kaya Aldoğan Sok. No: 16 Zincirlikuyu / İstanbul 34394 Türkiye

declare under our sole responsibility that the product:

product name: IP PBX

trade name: Karel

type or model: IPV10

to which this declaration relates is in conformity with the essential requirements and other relevant requirements of R&TTE Directive 1999/5/EC, European Electromagnetic Compatibility Directive 2004/108/EC, Low Voltage Directive 2006/95/EC.

The product is compliant with the following standards and/or other normative documents:

Low Voltage Directive 2006/95/EC:  
EN60950-1:2006

EMC Directive (2004/108/EC):  
EN 55022:2006+A1:2007 Class B  
EN 55024:1998+A1:2001+A2:2003  
EN 61000-3-2:2006  
EN 61000-3-3:2008

OTHER:  
FCC PART 15 Class B  
AS/NZS CISPR 22: 2006 Class B  
AS/NZS 60950.1:2003  
AS/ACIF S002.2005

Place and date of issue (of this DoC): 06.09.2012, İSTANBUL

Signed by Name and surname: GÖKHAN YAZICI - NOYAN DİNCEL

Title: Strategic Planning Director - Sales Director

Company chop with & person signature: KAREL ELEKTRONİK SANAYİ VE TİCARET A.Ş.



SINCE IPV50 SERIES IP TELEPHONE EXCHANGES ARE ELECTRONIC-BASED PRODUCTS, THE REQUIREMENTS BELOW SHOULD BE FULFILLED IN ORDER TO UTILIZE IT WITH DESIRED PERFORMANCE:



The system covers must not be opened by unauthorized persons in any way.



The cover of the exchange cabinet should always be kept closed.



All the ground connections on the covers must be fixed and checked before closing all the covers of the system.



Precautions must be taken in order to prevent any harmful substances from leaking or spilling into the exchange in any way.



Serious hazards may occur unless the conditions above are matched completely!

## CAVEAT

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**Note:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## CUSTOMER INFORMATION

1. This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the bottom of this equipment is a label that contains, among other information, a product identifier in the format US: UL7IS00BIPV10. If requested, this number must be provided to the telephone company.
2. A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product. It is designed to be connected to a compatible modular jack that is also compliant. See installation instructions for details.
3. If this equipment [Karel IP PBX IPV10] causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.
4. The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.
5. If trouble is experienced with this equipment [US: UL7IS00BIPV10], for repair or warranty information, Service can be facilitated through our office at:

U.S. Agent Company name:  
RONCO COMMUNICATIONS  
Address: 84 Grand Island Blvd  
Tonawanda, NY 14150  
Tel: 716-873-0760  
Fax: 716-879-8189

If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved. Please check if KAREL has office or agent at USA to provide the repair or warranty services? If not then, you can just provide the office at Turkey or other country.

6. Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.
7. If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of this [US: UL7IS00BIPV10] does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.
8. If the telephone company requests information on what equipment is connected to their lines, inform them of:
  - a) The ringer equivalence number [0.0B]

## TECHNICAL REFERENCE & INSTALLATION GUIDE

- b) The USOC jack required [RJ11C]
- c) Facility Interface Codes (“FIC”) [METALLIC]
- d) Service Order Codes (“SOC”) [9.0y]
- e) The FCC Registration Number [US: UL7IS00BIPV10]

9. The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. The REN for this product is part of the product identifier that has the format US: AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point. For this product the FCC Registration number is [US: UL7IS00BIPV10] indicates the REN would be 0.0B.

10. If this product is equipped with a corded or cordless handset, it is hearing aid compatible.



## FOR PROPER OPERATION OF SYSTEM



- Any mistake in the connections can damage your system. An authorized service must make these connections. The information in this guide is given just as explanatory information.
- The equipment does not contain parts that can be repaired / maintained. In case of a problem, consult authorized service.
- To avoid danger of burning and electrical shock, do not expose the system to rain or humidity.
- Keep your system away from excessive dust, high temperature, humidity and sunlight.
- You can clean the exterior part of your system with a slightly humid fabric. Before cleaning the system, remove it from mains power. Do not use any chemicals, liquid or aerosol cleansers, flammable liquids (thinner, gasoline, etc.) for cleaning purposes.
- Do not mount your system on mobile surfaces or near radiators or heat sources.
- When you want to change the location of the system, consult authorized service. When you need to carry your system, use its own box.
- Any external signal that will be used for testing your system or similar purposes can damage your telephone equipment or your system.
- Have your system installed in a ventilated place which is not exposed to direct sunlight with a temperature of 5 - 40 C° and without any humidity. There should be practical illumination within the room. The system must not be exposed to dust, vibration, and any oil - water effect.
- High frequency devices (welding machines, PC – telex and similar office tools, air conditioners, televisions etc.) must be avoided as much as possible or must be at least 3 meters away from the system.
- Continuous power cut-offs will effect systems normal operation. Therefore, pay attention to maintain proper power on your system.



<b>VERSION TABLE</b>	
<b>Guide's Date / Version</b>	
<b>21.12.2011/AAA</b>	
<b>05.06.2012/AAB</b>	

## **IPV10 Tech. Ref. and User Guide - Ver. AAB-05.06.2012**

For the development and enhancement of the features of the products specified in this document, KAREL reserves the right to make changes without prior notification. Products might possess different features, depending on their software and hardware versions.

# TABLE OF CONTENTS

<b>INTRODUCTION .....</b>	<b>1</b>
<b>GENERAL INFORMATION AND INSTRUCTIONS FOR USE.....</b>	<b>1</b>
<b>APPLICATIONS .....</b>	<b>4</b>
IP PBX FEATURES.....	4
HARDWARE FEATURES.....	4
PARTS LIST ON DELIVERY.....	5
<b>SYSTEM INSTALLATION .....</b>	<b>6</b>
CONNECTION DIAGRAM.....	6
CONNECTING THE ETHERNET CABLE .....	6
CONNECTION TO AN ELECTRIC SOCKET .....	6
IPV10 EXCHANGE WALL INSTALLATION:.....	7
<b>MANAGEMENT OF THE IPV10.....</b>	<b>10</b>
ADMINISTRATOR LOGIN.....	10
<b>SOFTWARE STRUCTURE.....</b>	<b>11</b>
THE IPV10'S OPERATING SYSTEM .....	11
IP EXTENSIONS AND LINE SERVICES .....	13
LICENSING FEATURES.....	15
NUMBERING PLAN.....	15
WEB SERVER – COMSER.....	16
<b>SPECIFICATIONS.....</b>	<b>18</b>
GENERAL SPECIFICATIONS .....	18
CONNECTIONS.....	19
ANALOG CHARACTERISTICS.....	20
IP CHARACTERISTICS.....	21
TONE CADENCE & FREQUENCIES* .....	22
RING CADENCES* .....	23
DTMF TONES:.....	23

# INTRODUCTION

IPV10 – An IP PBX for Small Offices and Home Offices

IPV10 — A hybrid IP-PBX for small offices, home offices and remote offices.

The IPV10 also offers a hybrid solution option (combining VOIP applications with standard telecom equipment) for those companies not yet ready for a standalone VoIP (IP Telephony) solution.

## About the User Guide

By following the installation advice supplied here you can quickly and easily start using your device.

Detailed explanations are provided in each related section of the user guide.

Please read the user guide carefully. In order to ensure problem-free operation of the device, please pay special attention to the remarks concerning safety. The manufacturer can not be held responsible for any result of not paying proper and full attention to these points.

# GENERAL INFORMATION AND INSTRUCTIONS FOR USE

## During Handling and Transportation, Please Pay Attention to the Following

Do not expose your product to any impacts during handling. Remove the product from its box carefully. Store all accessories in the box to prevent losing them. Initially check the product for any potential damage incurred during transportation.

## During Connection and Installation, Please Pay Attention to the Following

The end user is responsible for all connections and installation being undertaken in full accordance with the user guide. In the advent of any problem appearing during connection or installation, please contact an authorized service shop. (Refer to the list of authorized service shops)

## Situations in which Periodic Maintenance is Required

So long as the instructions in the user's manual are complied with, the product will not require any maintenance. The product should be serviced by authorized service staff only if it runs abnormally, or if it does not run at all. After the expiry of the warranty period, technical maintenance work must still be performed only by an authorized service centre.

## **Details about the Maintenance, Repair and Cleaning of the Product which can be Performed by the End User**

The product does not contain any maintainable parts. If any failure does occur, please contact one of the authorized service shops (Refer to the List of authorized service shops) or the authorized reseller who initially sold the product.

## **Information regarding Energy Efficiency**

Use the on/off button to turn the device off when the system is not in use.

## **Occurrences that may lead to Operational Failures**

Failures arising due to the product being operated in violation of the instructions provided in the user's manual.

Short-circuits when operated in hot or extremely humid environments.

Using any connection cables other than those provided by the manufacturer in the product's box and accompanying the product .

Customizations, modification or the removal of components by either the user or by any unauthorized service staff.

External physical impacts and direct breakage damages incurred by the product.

Destruction or removal of the product's batch number.

Any liquid being spilt on the product, or the product being exposure to water or to extreme moisture.

## **Potential Dangers to the Health of Humans, or the Environment, During Operation**

Please comply with the following basic safety precautions before operating the device.

All security warnings and user's instructions must be read carefully before operating the product.

Please follow all warnings and notices indicated on the unit.

To prevent the product passing a stray electric current or other accident (e.g. due to high temperatures) do not open the product's back cover. Contact the qualified staff of an authorized technical service shop for any repair work that may be required.

Keep the product away from places that receive direct sunlight. Do not expose the product to direct sunlight.

Install your device in a safe place. Make sure that the product's cables and cords are not trampled on. Do not place on the cables any object that may cause wear or damage to the cables.

## TECHNICAL REFERENCE & INSTALLATION GUIDE

Do not apply excessive force when pulling on any cable otherwise the cable may become damaged.

Do not overload the sockets and patch cords otherwise you run the risk of electric shock or fire.

Never allow unattended children to touch the device. Keep all packaging materials away from children. The device's handset is magnetic. Pay attention to any small metal objects (for example paper clips) which may become attached to the handset.

Due to negative impacts on both human and environmental health, do not dispose of the product in domestic waste. Please dispose of it in a proper recycling box.

# APPLICATIONS

## IP PBX FEATURES

Auto-Configuration	Call Transfer
IVR (Interactive Voice Response)	Call Waiting
Blind Transfer	CID
Call Record (CDR) Search	Do Not Disturb (DND)
Call Forwarding	Voice Message
Call parking	Group Ringing
Call Pickup	CID Routing
Call Recording	4-Person Conference Calling
Inbound/Outbound Call Routing	MRI(IP-PBX Recording Interface)
DISA	

## HARDWARE FEATURES

### EXTERNAL APPEARANCE

The Front Face

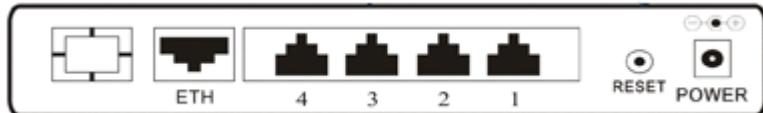


LED	Definition
Power	Green Led: Indicates that the power connection is normal
Run	Green Led: Indicates that the server system is running normally
Ready	Green Led: Indicates that the system is ready
Eth	Green Led: Indicates that the internet interface is in use
Port1	Red: For the FXO port Green : For the FXS port Double blinking - Red, quickly : The FXO port cannot connect to the PSTN line Double blinking - Red and Green, quickly : The FXO port has detected a call Double blinking - Red and Green, very quickly : There is a call on the FXO port

## TECHNICAL REFERENCE & INSTALLATION GUIDE

	Double Blinking - Red and Green, quickly : The FXS port is ringing LED Dual - Green and Red, quick : There is a Call on the FXS port
--	---

### Back



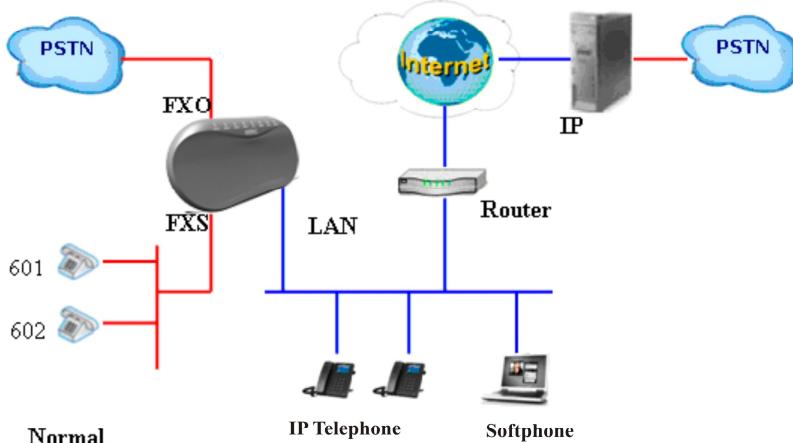
## PARTS LIST ON DELIVERY

- One IPV10 server unit
- One power source
- One Internet cable
- Some telephone cables [RJ-11]

Note: Please contact your reseller if any of the above-listed components are damaged or missing.

# SYSTEM INSTALLATION

## Connection Diagram



## Connecting the Ethernet Cable

The IPV10 has one 10/100M Ethernet port with RJ45 interfaces and LEDs. In addition to the transfer of voice data, the device also communicates data related to Ethernet port management, maintenance and operation.

Connect the Ethernet cable to the IPV10's Ethernet port, and connect the other end of the cable to a hub, switch, router, LAN or WAN. After connecting, check the LED light: a yellow light indicates that the connection is in progress; a green light indicates that the port is running.

## Connection to an Electric Socket

Requirements of the IPV10 system:

AC Input: 100~240VAC – 50~60 Hz.

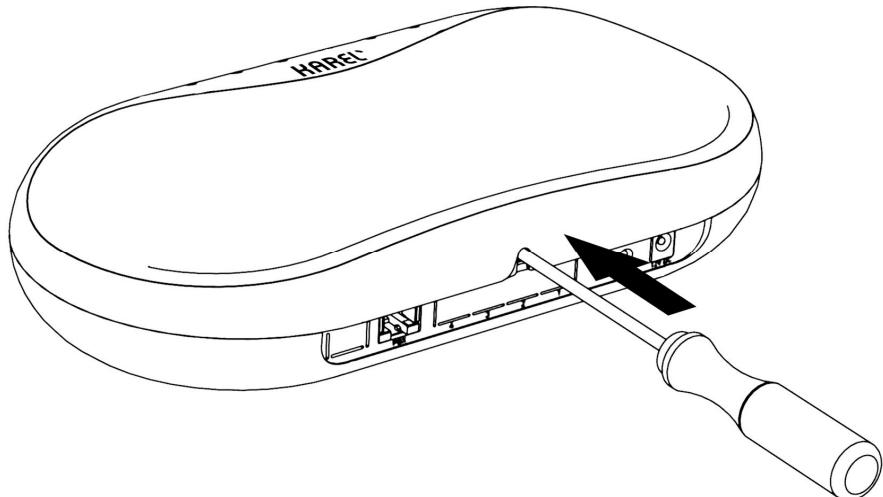
DC Output: 12V; 1 A

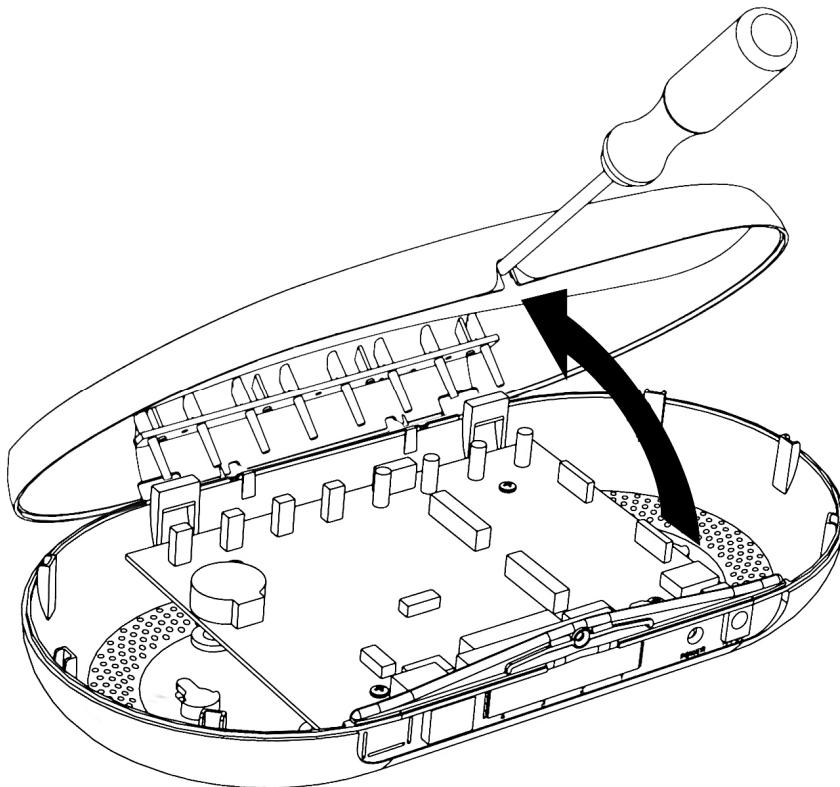
Please take the following steps when connecting the device to an electric socket.

1. Insert one end of the power cable into the input port on the back panel of IPV10. Insert the other end into a 220V electric socket.

## IPV10 EXCHANGE WALL INSTALLATION:

It is necessary to remove the front cover of IPV10 Exchange in order to hang it on the wall. Remove the screws located underneath the box for this purpose. Move the cover upwards using a screwdriver from its lower side as illustrated in picture so that the grappling hooks located on top will release the cover.

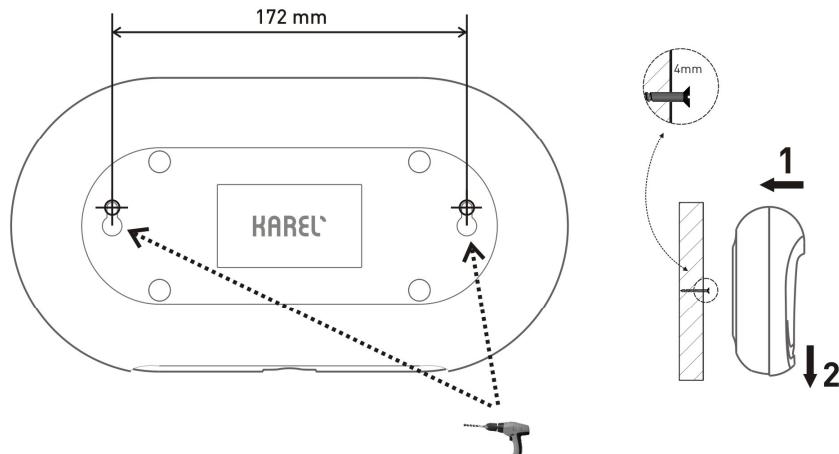




Take the following steps to install the box with its front cover removed to a wall:

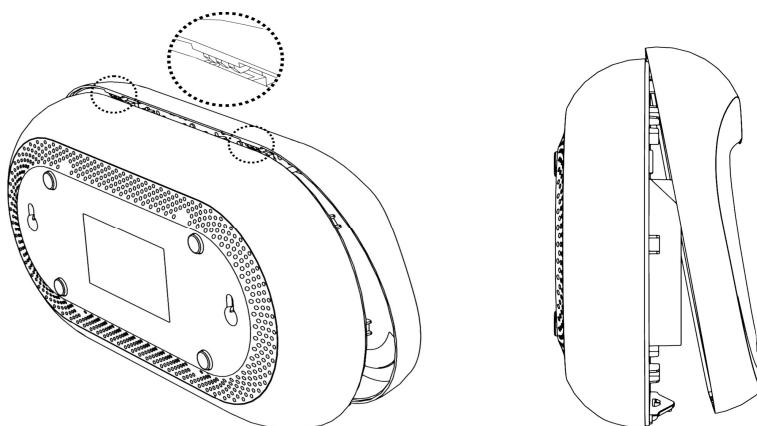
1. Use IPV10 Exchange Installation Template to determine the location of the terminal on the wall and to mark the location of the holes. The length of the power adapter cable must be considered when determining installation location.

# TECHNICAL REFERENCE & INSTALLATION GUIDE



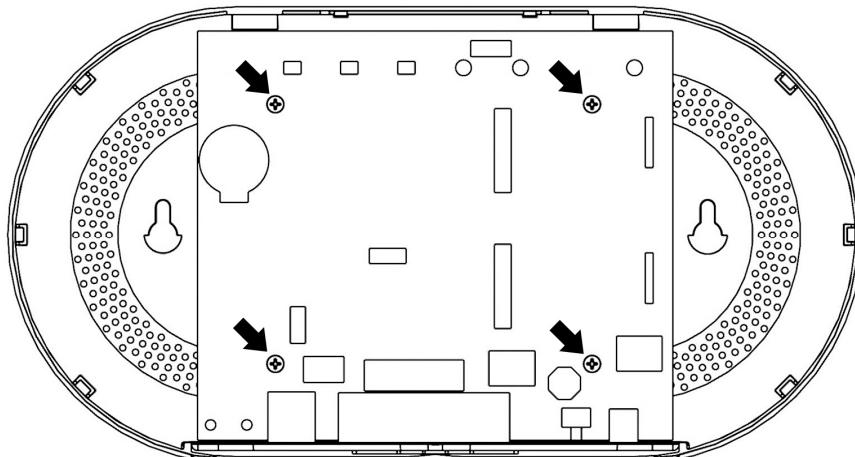
**Installation Template**

2. Insert pegs inside the holes drilled on the wall and install the screws into these pegs so that 4 mm from the head side of the screws will remain unscrewed.
3. Figure below device hang on the wall by hitting hanger holes and screw heads. If necessary, screws can be tighten.
4. Install the front cover. In order to secure the front cover, place the front cover over the grappling hooks located at the top side of the box first and then push the bottom side of the cover.



## TECHNICAL REFERENCE & INSTALLATION GUIDE

Note: There is no need to remove the electronic card from the box prior to installing the box on the wall. However, should it be necessary to remove the card from the box for any reason whatsoever, five screws illustrated in Figure-g must be removed in order to remove the card.



## MANAGEMENT OF THE IPV10 ADMINISTRATOR LOGIN

An IPV10 system has many software features. These services have been designed in a flexible manner to order to satisfy all users' various expectations. All services can be programmed via the IPV10's administration interface: ComSer. To do this, double click on your PC's Internet browser icon to open a browser page, and then enter the IP address of the IPV10 into the address bar.

For initial configuration of the IPV10, please use the IPV10's default login details to log in

IP Address: <http://192.168.180.8:8000>

User Name: admin

Password: karel



## SOFTWARE STRUCTURE THE IPV10'S OPERATING SYSTEM

The operating system of the IPV10 IP PBX is Linux. The main software has been designed based on UML, the most common object oriented software design discipline. All the Linux-based software development was undertaken using the Rhapsody (I-logics) Suite.

Since Linux is an open-source operating system, applications such as Unified Messaging and Call Center tools that have been developed for the same environment can easily be adapted for use with a PBX.

The software has been designed to be CSTA-XML(ECMA) / CCXML (W3C) compatible, in order to ensure full “computer-PBX” integration. Thus, any computer applications compatible with these interfaces can be directly integrated with the PBX.

Similarly, due to the Linux infrastructure, it is possible to integrate and use different applications on the system.

## TECHNICAL REFERENCE & INSTALLATION GUIDE

The IPV10's main software is saved as a compressed Flash image in the memory accompanying the CPU module. When the PBX initially starts running, it first loads the operating system into RAM memory from the compressed Flash memory, runs it, and then the system switches to its normal operating mode.

The system does not run any special software on its capacity expansion cards; all operations are controlled by the main processor. This results in a simpler and more reliable structure, perfect for a small or medium sized system.

System software updates do not require any changing of chips. There are two options when considering updates to system software:

- 1) The version of the software may be changed along with replacing the CPU module. However, this is a pretty expensive approach.
- 2) Alternatively, software can be uploaded remotely without interfering with the system's normal operation by simply connecting to an IP network. This is cheaper, much more reliable and faster as it does not require any stopping of the system. So this method is recommended.

### *IMPORTANT*

The system software can be updated while the PBX continues to run.

## TECHNICAL REFERENCE & INSTALLATION GUIDE

The IPV10's software has been designed to satisfy a broad range of customer requirements. Looking at system software, there are three categories:

1. User features,
2. Operator features,
3. Programs.

User features are those which any user can access through any type of phone.

Operator features are those software abilities that can only be utilized by those extensions authorized to do so by the system.

In general, programming of the system is undertaken via remote access, from a computer's web browser to the Web Server on the IPV10 (ComSer). Most of the parameters that control the system's operation can be changed by programming.

In addition, some operator-level programs can also be accessed by those extensions that have been provided with authorization to login into the programming mode via dialing the appropriate code on the telephone.

Initially, access to the system's Web server is provided to those users defined as 'operators' or as 'system authorities'.

## IP EXTENSIONS AND LINE SERVICES

One of the most important features of the IPV10 IP Telephone PBX is the provision of integrated support for IP Extensions and IP Lines.

A maximum of 20 IP Extensions and 8 VoIP channels with associated IP Lines are supported by an IPV10 PBX's integrated IP Extensions and Lines.

IP extensions run the SIP protocol. IP Lines support both the H323 and SIP protocols. (Support for both the H323 and the SIP protocol are supplied by a single MGW card)

The parametric programming of IP extensions and IP lines on the system is undertaken via an interface to ComSer, similar to the programming of the other TDM channels of the PBX.

The System's number of Gateway channels is a maximum of 8. Thanks to this, there will not be any transition limitation on calls between IP and analog ports.

IP extensions registered to the PBX can use all standard SIP services, but they cannot use all of the services available to the PBX's other analog/digital extensions. They can only use specific PBX services. Some of the services that can be used by IP extensions are listed here:

- Shared Memory Records / Searches in Shared Memory
- Call Parking
- Call Pick Up / Group Call Pick Up

## TECHNICAL REFERENCE & INSTALLATION GUIDE

- Call Forwarding
- Conference calls
- Completion of a Call to a Busy Subscriber
- Authorization Transfer
- CLIR Activation
- CLOR Activation
- Executive Secretary Feature
- Leaving a Message for a Selected Extension

For further information on all the services supported by IP Extensions, please refer to the IPV10 Series User's Guide.

An IPV10 extension supports IP extensions via its IP services. Thus IP extensions can be supported behind ADSL. To enable this the system supplies NAT/STUN support.

During IP connections to a VPN, the IP extension applications act as if they were connected locally. IP port routing is not required.

IP wireless phones (WiFi phones) and IP Dect System are both supported by IPV10 PBX IP services. Thus WiFi and IP Dect extensions can also obtain services from the system, similar to that provided to standard SIP extensions.

WiFi phones are IP phones which connect via special IP switches named direct wireless access points. Actually, as a result these are not in any way different from IP phones connected to a normal switch on a local network.

IP Dect and WiFi phones must be directly registered on the SIP Server if the IPV10 PBX is to be able to service them.

IP Lines can be selected so as to support the H323 and SIP protocols. The system can include lines supporting the SIP and H323 protocols at the same time.

IP Lines can be used to build IP connections (Tie-Lines) between PBX's. They can also be used to connect to a private operator's IP lines or to Proxy Servers/GateKeepers throughout the company.

After IP Lines have been defined via the ComSer interface, line groups are similarly created for the other lines groups, the routes are defined and then put into service.

## LICENSING FEATURES

The use of IP extensions and lines on an IPV10 IP Telephone PBX requires special licenses. In addition, further features can be utilized via these special licenses. The features that require licenses are listed in the following list:

1. Web-CM+Net-Console or Net-CM+Net-Console License
2. Private IP Extension License
3. SIP Extension License
4. SIP&H.323 Line License
5. VoIP Encrypted&Unencrypted Channel License
6. Instant Messaging License
7. EVM Channel License

On a IPV10 IP Telephone PBX, by default:

Eight (8) SIP PBX's + Two (2) Private IP Extensions + Two (2) SIP Lines + Four (4) VoIP Channel License are supplied.

Licensing features are enabled via a security code embedded in the IPV10's mainboard.

Please contact your authorized service shop for License Keys. License keys you request and purchase can be entered into the License Settings field on the ComSer interface.

## NUMBERING PLAN

When the installation of a IPV10 IP Telephone PBX of the required capacity is completed and the device is initially run, it automatically scans its configuration and assigns a numbering structure which conforms to the configuration of the lines, as listed.

The IPV10's numbering is done dynamically, but in accordance with its configuration. Extensions with that already have values assigned to them are added onto the existing numbering plan as new cards are added to the system. These extensions' numbers are then assigned, starting from the highest number of the existing plan.

Initially, the numbering plan is assigned in three steps, beginning at 101 and then incrementing by one for each extension. That is, the existing plan's numbers are extended, one by one, as each extension or line card is added to the system.

If required, the PBX's numbering plan and code structure can be modified as desired, due to its flexible numbering. The desired numbering plan can be created in a maximum of eight steps.

## WEB SERVER – COMSER

The IPV10's maintenance, programming and monitoring actions can all be realized, in real-time, from any remote computer on the same network as the IPV10.

To do this, a WEB server, ComSer, has been designed for the IPV10, thus eliminating the need for any special software while, at the same time, allowing access to the PBX from any web browser.

Thus each user can utilize the PBX's functionality from his or her computer, given the appropriate authorization. Moreover, because the web server is an integrated component of the IPV10's operating system, there will not be any incompatibility between application versions.

Backups can be saved on a local computer via the ComSer web server. Previously, saved backups had to be restored to the system via the "Database Converter". However, older configurations can still be used with these newer versions.

All of the following operations can be undertaken via the integrated web server:

- 1) PBX programming
  - a) Programming all of the interface parameters
  - b) The setting of all extension and line parameters
  - c) The programming of general PBX parameters
  - d) The programming of all administration and routing parameters
- 2) System updates
  - a) Updating server settings
  - b) The display of the current software versions
  - c) Automatic software updates
  - d) Remote access to system settings, for export or recording
  - e) The changing of IP addresses
- 3) Call record details. (Net-CM or Web-CM will be used here):
  - a) Transfer of call record details to a local computer
  - b) Pricing
  - c) Filtering, archiving and the compiling of statistical data

# TECHNICAL REFERENCE & INSTALLATION GUIDE

The following window of the ComSer programming interface appears:

System > VoIP Parameters

**VoIP**   **Alternative Routing**

WAN IP	0.0.0.0
Signalling Port for SIP Messages	5060
RTP Base Port	10000
Music On Hold	<input type="checkbox"/>
RFC5589 Compatible Transfer	<input type="checkbox"/>
SIP Session Timer	0
SIP Min Session Timer	90
STUN Server Active	<input type="checkbox"/>
STUN Server IP Address	0.0.0.0
STUN Port	3478 (80~34780)
H323 Active	<input type="checkbox"/>

**Save**

**<<Back**

# SPECIFICATIONS

GENERAL SPECIFICATIONS		
1.	Capacity (TDM) Capacity (IP)	<ul style="list-style-type: none"> <li>- A single system with four (4) lines</li> <li>- A maximum of . 20 IP lines</li> </ul>
2.	Testing	<ul style="list-style-type: none"> <li>- Blackfin DSP</li> </ul>
3.	Switching	<ul style="list-style-type: none"> <li>- PCM/TDM A rule</li> <li>- IP</li> </ul>
4.	Power	<ul style="list-style-type: none"> <li>- 110~240 VAC – 50~60 Hz.</li> <li>- Mainboard + CPU module Stand-by Power Consumption: 1W</li> <li>- EXP20 Stand-by Power Consumption: 0.5W</li> <li>- Max. Power Consumption: 20W</li> </ul>
5.	Dialing	<ul style="list-style-type: none"> <li>- Dual Tone Multi Frequency Dialing (DTMF) 140 msec (analog lines)</li> <li>- Digital (info)</li> </ul>
6.	Dialing Conversations	<ul style="list-style-type: none"> <li>- IP (RFC283 info)</li> <li>- DTMF – DP</li> <li>- RFC283 – info elements</li> </ul>
7.	Speech Channels (TDM) Speech Channels (IP)	<ul style="list-style-type: none"> <li>- 4 x 4</li> <li>- IP to IP in local network unlimited.</li> <li>- IP to TDM 4 channels</li> </ul>
8.	MF Receiver Capacity	<ul style="list-style-type: none"> <li>- 4</li> </ul>
9.	MF Producer Capacity	<ul style="list-style-type: none"> <li>- 4</li> </ul>
10.	CRL Capacity	<ul style="list-style-type: none"> <li>- Approximately 2000 Calls</li> </ul>

## CONNECTIONS

1.	Connectors	<ul style="list-style-type: none"><li>- Lines and Extensions: RJ11 type</li><li>- Ethernet: RJ45 type</li></ul>
2.	External Connections	<ul style="list-style-type: none"><li>- Standard Telephones: 2-wire</li><li>- PC: 10baseT Straight Cable</li></ul>
3.	CRL (Call Record Listing)	<ul style="list-style-type: none"><li>- WEB-CM</li><li>- Net-CM</li></ul>

ANALOG CHARACTERISTICS		
1.	Analog Extension Interface	- Station Loop Resistance: Maximum 2500 Ohm, including telephone set
2.	Maximum Analog Line Cycle Resistance	- 2.2 kOhm
3.	Analog Line Interface	- Analog line with Cycle Initiation through DTMF Signaling - 12/16 KHz Pulse Price Signal Detection - Polarity Reversal Detection
4.	Analog Extension Supply Voltage	- -48 VDC
5.	Wait Time between Two Consecutive Dials by the Auto-dialer	- 175 _ 5 msn
6.	Cross-Talk Attenuation	- Better than 70 dB
7.	Maximum number of telephone sets per extension	- 2 Telephone Sets (for analog extensions)
8.	Auto attendant message capacity	- 10 minutes
9.	Total Voice Message capacity	- 14 hours
10.	Ringer Voltage	- 65 V rms, 25-30 Hz
11.	Minimum Detectable Ringer Level	- 35 V rms, 25-30 Hz
12.	Hook flash Duration	- 100 – 600 msec*
13.	Environmental Conditions:	- 0C <sup>0</sup> – 40C <sup>0</sup> , Humidity 10%–80% non-condensing
14.	Dimensions	- 220x144x62mm
15.	Weight	- 500 g
16.	Maintenance	- Embedded Self Test / Solution - Local / Remote Programming

IP CHARACTERISTICS		
1.	Voice compression (Codec support)	<ul style="list-style-type: none"> <li>- G711 a/u-law</li> <li>- G729A/B</li> <li>- G723.1</li> <li>- iLBC</li> </ul>
2.	Echo removal - period	<ul style="list-style-type: none"> <li>- 16 msec EC (conforms to the G.168 standards)</li> </ul>
3.	In-band support	<ul style="list-style-type: none"> <li>- Yes</li> </ul>
4.	Out-of-band	<ul style="list-style-type: none"> <li>- RF2833 support</li> <li>- INFO support</li> </ul>
5.	Telephone	<ul style="list-style-type: none"> <li>- Standard SIP softphone</li> <li>- IP phones</li> <li>- SIP-compatible WiFi wireless phones (support 802.11g protocol)</li> </ul>
6.	Web server support	<ul style="list-style-type: none"> <li>- Yes</li> </ul>
7.	System Management/Monitoring	<ul style="list-style-type: none"> <li>- HTTP, Telnet, TFTP</li> </ul>
8.	SNTP	<ul style="list-style-type: none"> <li>- Yes</li> </ul>
9.	NAT support	<ul style="list-style-type: none"> <li>- Yes</li> </ul>
10.	QoS support	<ul style="list-style-type: none"> <li>- Yes</li> </ul>
11.	Jitter buffer	<ul style="list-style-type: none"> <li>- Yes</li> </ul>
12.	sRTP support	<ul style="list-style-type: none"> <li>- Yes</li> </ul>
13.	CNG support	<ul style="list-style-type: none"> <li>- Yes</li> </ul>
14.	VAD support	<ul style="list-style-type: none"> <li>- Yes</li> </ul>
15.	DNS support	<ul style="list-style-type: none"> <li>- Yes</li> </ul>
16.	STUN support	<ul style="list-style-type: none"> <li>- Yes</li> </ul>

TONE CADENCE & FREQUENCIES*		
1.	Dial Tone (500 Hz.)	Continuous
2.	Ring back Tone (500 Hz.)	1500 msec on, 3500 msec off
3.	Busy Tone (500 Hz.)	500 msec on, 500 msec off
4.	DISA Dial Tone (500 Hz.)	300 msec on, 300 msec off, 300 msec on, 300 msec off, 300 msec on, 2000 msec off
5.	Dial Tone with Message Waiting (500 Hz.)	300 msec on, 300 msec off, 300 msec on, 300 msec off, 300 msec on, 2000 msec off
6.	Error Tone (500 Hz.)	300 msec on, 300 msec off, 300 msec on, 300 msec off, 300 msec on, 300 msec off, 700 msec on, 300 msec off
7.	Dial Tone (Reminder Active)	1000 msec 500 Hz., 1000 msec 250 Hz.
8.	Special Dial Tone (250 Hz.)	Continuous
9.	Overflow Tone (2000 Hz.)	700 msec on, 200 msec off
10.	Warning Tone (250 Hz)	20 msec on, 1500 msec off

\* Some tone and cadence values can be modified via the ComSer programming interface.

## RING CADENCES\*

1.	External Call, Call Back, Reminder/Wake Up Calls	1500 msec on, 3500 msec off
2.	Internal Call	400 msec on, 350 msec off, 400 msec on, 3500 msec off

\*These values can be changed via the programming interface.

## DTMF TONES:

		High Frequency Group (- 7 dBm)		
		1209 Hz	1336 Hz	1477 Hz
Low	697 Hz	1	2	3
Frequency	770 Hz	4	5	6
Assembly	852 Hz	7	8	9
( - 9 dBm)	941 Hz	*	0	#

The Nominal Frequencies of the IPV10 may deviate, by +/- 2.5 %, from the values listed above.