KAREL IPV20

IPV20 TECHNICAL REFERENCE & INSTALLATION GUIDE

13/06/2012

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: UL7IS00BIPV20. 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 IPV20] 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: UL7IS00BIPV20], 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: UL7IS00BIPV20] 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]

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: UL7IS00BIPV20]

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: UL7IS00BIPV20] indicates the REN would be 0.0B.

CAUTION

SINCE IPV20 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!

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 chance 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^{o} 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.

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INTRODUCTION

IPV20 – IP PBX FOR SMALL OFFICES AND HOME OFFICES

IPV20 — A hybrid IP-PBX for small offices, home offices and remote offices.

The IPV20 also offers a hybrid solution option (combining VOIP application with standard telecom equipment) for those companies not yet ready for a standalone VoIP (IP Telephony) solution.

APPLICATIONS

IP PBX FEATURES

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

EXTERNAL APPEARANCE

The Front Face

Nr.	Description	
1.	Green Light	Indicates a normal connection to the power cable.
2.	Green Light	Indicates that the server system is running properly.
3.	Green Light	Indicates that the Internet WAN is in use.
4.	Green Light	Indicates that the Internet LAN is in use.
5.	Red light	An indicator for the FXO port

A flashing red light indicates that the FXO port is not connected to a line.

A slow red and green blinking light indicates an incoming call on the FXO port.

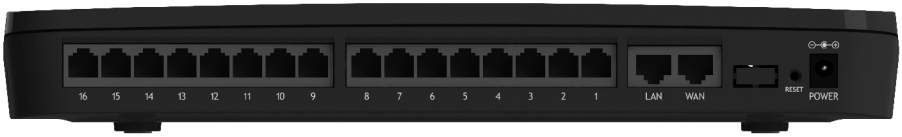
A quickly flashing red and green light indicates that the FXO port is in use.

A green light is an indicator for the FXS port.

A blinking green and red light indicates an incoming call on the FXS port.

A quickly flashing green and red light indicates that a call is ongoing on the FXS port.

Back



LAN-WAN: Ethernet (RJ45)

1-8: Line Ports (RJ11)

9-16: Analog Telephone Ports (RJ11)

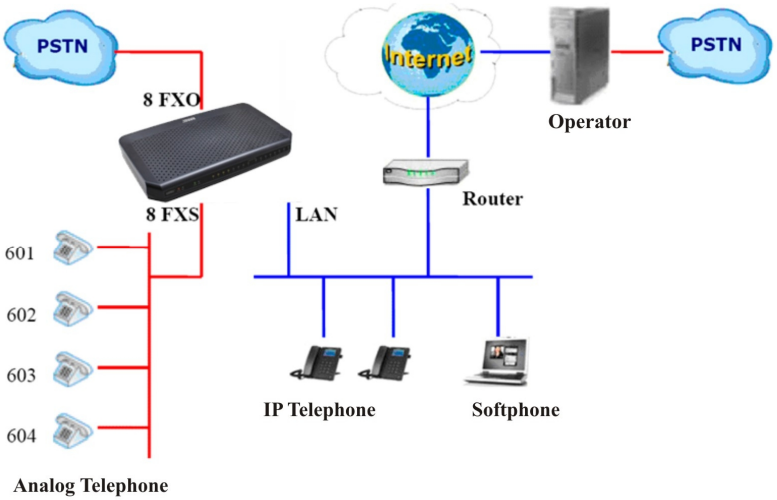
PARTS LIST ON DELIVERY

- IPV20 server unit
- Power source
- Internet cable
- Some telephone cables [RJ-11]

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

SYSTEM SETUP

CONNECTION DIAGRAM



Connecting the Ethernet Cable

The IPV20 has two (IPV20'de ilki adet port var. IPV10'da 1 adet port var) (10/100M) Ethernet ports with accompanying 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 IPV20'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 IPV20 system:

AC Input: 100~240V

DC Output: 12V, 3 A

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

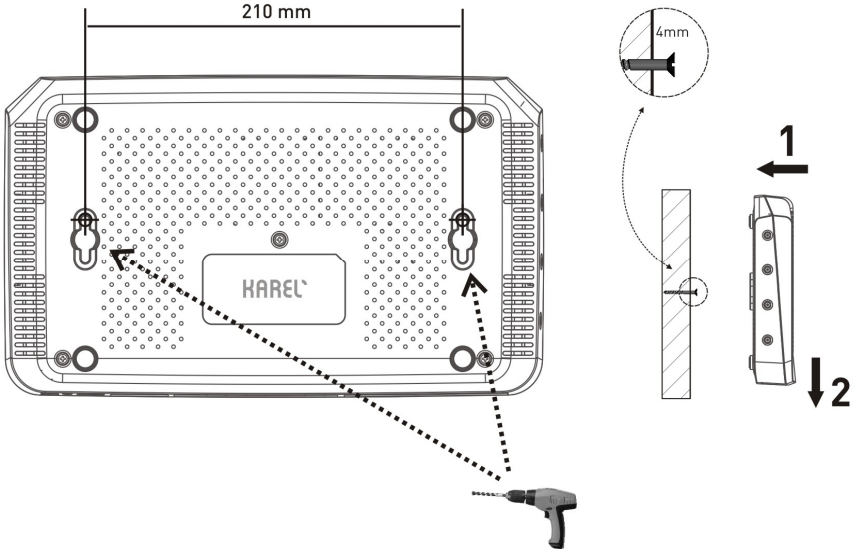
1.Insert one end of the power cable into the input port on the back panel of IPV20. Insert the other end into a 220V electric socket.

2. After connecting the Power, please check if the Power LED on the front panel lights up. A lit LED indicates that the power is properly connected. If the LED does not light up then please repeat all of the steps, from step one to step three.

IPV20 EXCHANGE WALL INSTALLATION:

Take the following steps to install the box to a wall:

1. Use IPV20 Exchange "Installation Illustration" 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.

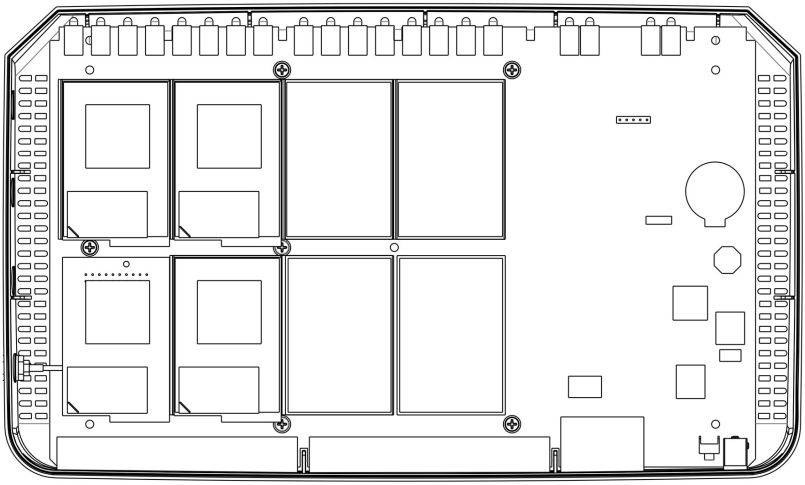


Installation Template

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 above device hang on the wall by hitting hanger holes and screw heads.

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 must be removed in order to remove the card.



MANAGEMENT OF THE IPV20

ADMINISTRATOR LOGIN

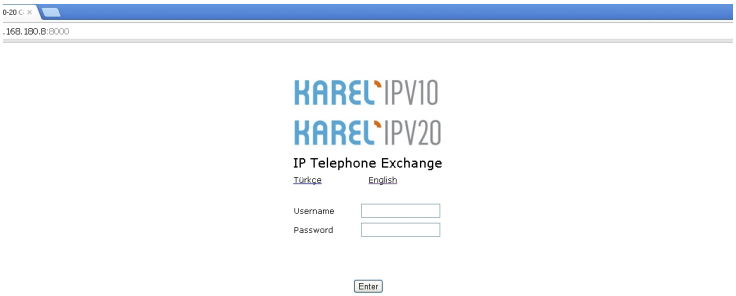
An IPV20 system has many application properties. These services have been designed in a flexible manner to order to satisfy all users' various expectations. All services can be programmed via the IPV20's administration interface: ComSer. To do this, double click on your PC's Internet browser icon to open a browser page, and then enter the IP address of the IPV20 into the address bar.

For the first-time configuration of an IPV20, please use the IPV20's default login details to log in

IP Address: http://192.168.180.18:8000

User Name: admin

Password: karel



SOFTWARE STRUCTURE

THE IPV20'S OPERATING SYSTEM

The operating system of the IPV20 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 Rapsody (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.

The IPV20'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.

The IPV20'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 PC's web browser to the Web Server on the IPV20 (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 EXTENSION AND LINE SERVICES

One of the most important features of the IPV20 IP Telephone PBX is the provision of integrated support for IP Extensions and IP Lines.

A maximum of 40 IP Extensions and 8 VoIP channels with associated IP Lines are supported by an IPV20 PBX's integrated IP Extension and Line support.

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. That is, **8** analog and IP channels can make simultaneous calls.

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:

- Common Pool Records / Call in common pool
- Call Parking
- Call Pick Up / Group Call Pick Up
- Call Forwarding

- Conference
- Call Back
- Authorization Transfer
- CLIR Activation
- CLOR Activation
- Executive-Secretary Feature
- Leaving a Message to an Extension

For further information on all the services supported by IP Extensions, please refer to the IPV20 Series User's Guide.

An IPV20 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 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 IPV20 IP Telephone PBX requires private 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 IPV20 IP Telephone PBX, by default:

Twelve (12) 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 IPV20'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 IPV20 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 IPV20'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 IPV20's maintenance, programming and monitoring actions can all be realized, in real-time, from any remote PC on the same network as the IPV20.

To do this, a WEB server, ComSer, has been designed for the IPV20, thus eliminating the need for any special software while, at the same time, allowing access to the PBX from any web browser.

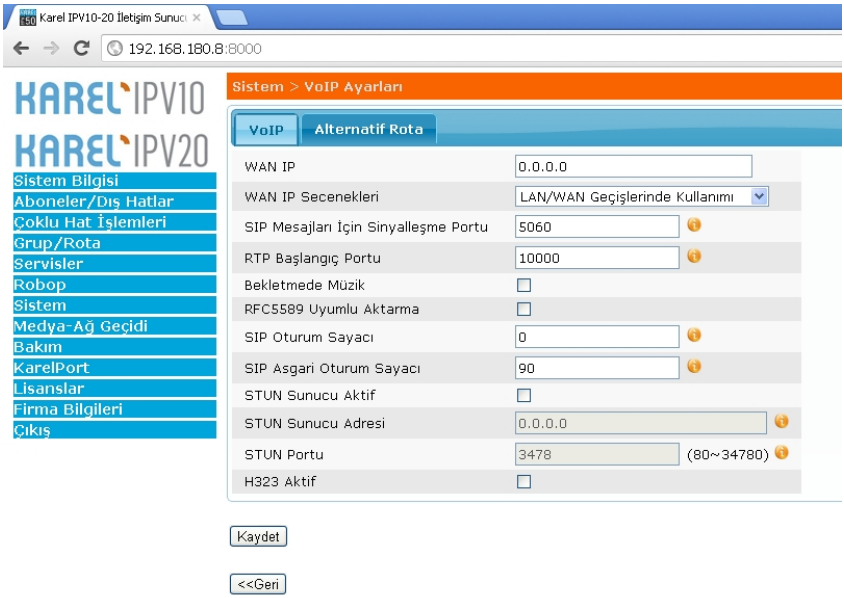
Thus each user can utilize the PBX's functionality from his or her computer, given the appropriate authorization. Moreover, because the web server is an integrated component of the IPV20's operating system, there will not be any incompatibility between application versions.

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

The following window of the ComSer programming interface appears:



SPECIFICATIONS

GENERAL SPECIFICATIONS		
1.	Capacity (TDM) Capacity (IP)	- 16 lines on each individual system - A maximum of . 40 IP lines
2.	Testing	- Blackfin DSP
3.	Switching	- PCM/TDM A rule - IP
4.	Power	- 230 VAC – 50 Hz. - Mainboard + CPU module Stand-by Power Consumption: 1W - EXP20 Stand-by Power Consumption: 0.5W - Max. Power Consumption: 20W
5.	Dialing	- Dual Tone Multi Frequency Dialing (DTMF) 140 msec (analog lines) - Digital (info)
6.	Dialing Conversions	- IP (RFC283 info) - DTMF – DP - RFC283 – info elements
7.	Speech Channels (TDM) Speech Channels (IP)	- 32 x 32 - **8** channels
8.	MF Receiver Capacity	- 12
9.	MF Producer Capacity	- 4
10.	CRL Capacity	- Approximately 2000 Calls
CONNECTIONS		
1.	Connectors	- Lines and Extensions: RJ11 type - Ethernet: RJ45 type
2.	External Connections	- Standard Telephones: 2-wire - PC: 4-wire (ethernet)
3.	CRL (Call Record Listing)	- WEB-CM - Net-CM

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:	- $0C^0$ – $40C^0$, Humidity 10%–80% non-condensing
14.	Dimensions	- 280x175x33mm
15.	Weight	- 700 g
16.	Maintenance	- Embedded Self Test / Solution - Local / Remote Programming

IP CHARACTERISTICS		
1.	Voice compression (Codec support)	- G711 a/u-law - G729A/B - G723.1 - iLBC
2.	Echo removal - period	- 16 msec EC (conforms to the G.168 standards)
3.	In-band support	- Yes
4.	Out-of-band	- RF2833 support - INFO support
5.	Telephone	- Standard SIP softphone - IP phones
6.	Web server support	- Yes
7.	System Management/Monitoring	- HTTP, Telnet, TFTP
8.	SNTP	- Yes
9.	NAT support	- Yes
10.	QoS support	- Yes
11.	Jitter buffer	- Yes
12.	sRTP support	- Yes
13.	CNG support	- Yes
14.	VAD support	- Yes
15.	DNS support	- Yes
16.	STUN support	- Yes

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 IPV20 may deviate, by ± 2.5 %, from the values listed above.

06/2012