SERVER BASED IP COMMUNICATION PLATFORM

KAREL IPG SERIES: IPG500 | IPG1000
Outlook integration and collaboration. IPG communication platform runs on SUSE Linux 12.2 operating system, which provides an open-ended architecture as well as lower processing requirements. Field tests show that even a low performance server with 1.6 GHz single-core processor and 512 MB RAM is enough to install a fully featured IPG communication platform serving to 2000 IP subscribers. Evidently, increasing the processing power increases the maximum capacity of the system.

CONVERGENCE
Developments in information technologies have already brought the concept of convergence. Today, it is not possible to think of a modern communication system independent of IT infrastructure. A telephone directory is now only a piece of data stored in organisation’s LDAP (Lightweight Directory Access Protocol) server. Likewise, authentication of a user to log into a software component through RADIUS (Remote Authentication Dial In User Service) server is also applicable for authentication of IP phones.

BACKWARD COMPATIBILITY
IPG communication platform is an ideal solution for organisations that require backward compatibility while migrating to future technologies. Compliance both with IPv4 and IPv6 is only an example.

KAREL IPG is a modular and server based IP communication platform designed to meet the needs of medium and large organizations.

FLEXIBLE STRUCTURE
Karel IPG communication platform meets different interface requirements and integrates with pure IP infrastructures, as well as hybrid and traditional TDM networks.

HARDWARE FEATURES
Depending on the interface and capacity requirements, IPG communication platform offers different hardware options. For pure IP configurations, the system runs on industry standard servers and provides a maximum capacity of 32000 IP ports. If traditional telephony interfaces are also required, IPG500 and IPG1000 racks serve as media gateways giving a maximum of 32000 ports for TDM. Therefore, the maximum system capacity becomes 64000 ports. There is also a compact usage of IPG500 and IPG1000 racks without requiring a server. This way, a single IPG500 rack can provide 224 TDM & 500 IP ports and a 3-rack-stacked configuration of IPG1000 system can provide a maximum of 1056 TDM & 2000 IP ports.

SYSTEM FEATURES
Communication platform is an essential component of an organisation's work processes and plays a critical role in efficiency. IPG communication platform simplifies the work processes in an organisation by integrating several services such as integrated voice response, voice mail, voice mail to email, voice logger, video/audio conferencing, presence, instant messaging, Microsoft Outlook integration and collaboration. IPG communication platform can be configured as a softswitch (server), a compact IP based system with integrated media gateway or a combination of server and media gateway racks.
DISTRIBUTED ARCHITECTURE

Standalone components of IPG communication platform are location independent. Server, redundant server or media gateway racks can all be distributed to different locations. In addition to typical trunking protocols such as SIP or H.323, IPG platform employs IPCC, a proprietary protocol developed by Karel, for seamless integration of servers and racks (media gateways) through an IP network. IPCC lets the distributed components of the system to work as a single communication platform.

In case of a failure in communication between server and media gateways, media gateways automatically switch to self-survival mode and continue providing the same services over the internal server. This internal server is in the form of a CPU card with Qseven module and redundancy for this CPU card is also available in the system.

USER INTERFACES

All user interfaces of IPG communication platform are web based and compatible with all popular web browsers including the browsers of mobile devices such as smartphones or tablets. This gives the convenience of becoming location independent when using or managing the system remotely.

FUTURE PROOF

IPG communication platform allows growing organizations to expand their communication systems cost effectively over time.
IP APPLICATIONS & UNIFIED COMMUNICATIONS

MOBILITY
IPG Series provide a reliable and cost effective communication platform to mobile workers. Karel’s smartphone or softphone applications extend the unified communications features to smartphones, tablets or laptops through 3G or Wi-Fi networks.

To keep pace with desk free people at work, IPG communication platform provides coverage through DECT base stations or Wi-Fi access points and enables a reliable cordless communication at every point.

Organisations are becoming location independent and often all workers are not in the office at the same time. Besides, some people in the office rarely need a phone. This brings the idea of saving from office resources and sharing of a telephone device. Hot desking feature of IPG communication platform lets the users share an IP phone by logging in with their own accounts. After logging in, a common IP phone becomes the personal phone of the user with his/her own extension number and customized settings. Reports of calls through these common phones will be kept as per users’ specific extension numbers. With hot desking feature, a common phone in a meeting room often used to ask for refreshments can immediately become an executive phone with extensive calling permissions and features.

USER WEB PAGE (WEB-CONSOLE)
With IPG communication platform, telephony experience of users is not limited to a telephone device. Each user of IPG communication platform has a web based interface for making calls and managing their accounts from their PCs, tablets or smartphones. Users can initiate calls, manage conference rooms, set call forwarding parameters, monitor call history, view missed calls or receive voice mails through web-console interface.

MICROSOFT OUTLOOK® INTEGRATION
IPG communication platform integrates with Microsoft Outlook® software. Users of IPG communication platform can perform call tasks through their email software.

CONFERENCE ROOMS
Conferencing facility lets the organisations save from travel costs and time. Users can define passwords for restricted access to their conference rooms or manage conferences through their web based interfaces.

INSTANT MESSAGING
IP phone users of IPG communication platform can send and receive instant text messages.

PRESENCE
Presence states of all users can be monitored through web interfaces or phones having BLF (Busy Lamp Field).

VIDEO COMMUNICATION
All IP extensions of IPG communication platform can enjoy video communication by using IP video phones or Karel’s smartphone/softphone applications.

IN ADDITION TO STANDARD FEATURES OF SIP TELEPHONY, IPG COMMUNICATION PLATFORM PROVIDES UNIFIED COMMUNICATIONS TO ALL USERS THROUGH COMPATIBLE IP PHONES AND MOBILE DEVICES.
validity of a specific tariff plan can be programmed as per various
date and time parameters.

FAX SERVER
IPG communication platform supports T.38 protocol for
transmission of fax messages over IP lines and employs a fax
server for distribution of fax messages through email.

GSM GATEWAY & SMART CALL BACK
IPG communication platform is fully compatible with Karel GT40M
GSM gateway. A common drawback of having a missed call from
an organisation’s GSM gateway occurs when the called party
wants to call back. As the initial call to the mobile phone has
passed through the GSM gateway, called party would only see the
common phone number of the SIM card installed in the GSM
gateway.

Therefore, if the called party calls back the missed number, the
call would be most probably answered by the operator or the auto
attendant, but not by the specific person who initiated the first call.
For such cases, IPG communication platform automatically diverts
the call-back of missed mobile call to the initial caller.

INTEGRATION WITH OTHER SYSTEMS
It is possible to integrate IPG communication platform with various
solutions through standard interfaces and protocols. Integration
facilities include hotel/property management systems such as
Fidelio, video conferencing, collaboration solutions, security
solutions, customer relationship management solutions or call
centers.
WIDEA
WIDEA is the web based management software of IPG communication platform for programming, maintenance and alarm management. Different authority levels can be assigned to different administrator accounts using WIDEA. As the software is web based, administrators have the flexibility of having remote access to the system through PC's, tablets or smartphones.

REMOTE SOFTWARE UPDATE
All software components of IPG communication platform can be remotely loaded to the system. By just having an Ethernet access to the system, administrators can perform all the software related issues from a remote location.

AUTO CONFIGURATION
Depending on the quantity of IP phones in an organisation, reconfiguring all the IP phones one-by-one may become practically impossible. Auto configuration feature of IPG communication platform lets IP phones to be configured all together or as groups.

WEB BASED USER INTERFACES
All computer interfaces of IPG communication platform are web based. Any device with a compatible web browser can be used for accessing the system from any location.

COMPATIBILITY WITH IT ENVIRONMENT
Hardware components of IPG communication platform perfectly fit into the IT room. Servers and racks are compatible with 19" standard cabinets. As the communication between the standalone units of the platform are purely through IP, integrating them require only standard network elements or cables such as CAT5/6 or fiber optics. All interface ports of the platform (including TDM ports) require only the standard RJ45 connectors.

OPERATING SYSTEM AND COMPUTER PERIPHERALS
SUSE Linux 12.2 operating system provides an open-ended architecture and lower processing requirements to IPG communication platform. It is also possible to directly connect computer peripherals such as monitor, keyboard or mouse to servers or racks of IPG communication platform.

IPv6 COMPATIBILITY
In order to provide a future proof solution, Karel IPG communication platform is compatible with IPv4, IPv6 as well as hybrid networks that utilize both IPv4 and IPv6.

DIRECT FIBEROPTIC CONNECTIVITY & INTERNAL ETHERNET SWITCHES
IPG communication platform does not require any external devices for fiber optic connectivity. It is possible to directly terminate fiber optic cable on IPG500 or IPG1000 racks. Also, the platform is equipped with built-in Ethernet switches on CPU, media gateway and fiber optic cards. As IPG platform does not require an external Ethernet switch or fiber optic converter, related complexities of feeding or maintaining these critical components are eliminated.

ALARM AND FAILURE MANAGEMENT
IPG communication platform is equipped with an integrated alarm and failure management system. This system lets system administrators to monitor (real time), report (real time) or log the
possible system faults or link/port failures. Depending on the importance of fault conditions, alarm actions may include triggering calls, SMS or email messages to predefined recipients or initiating audiovisual signals on the alarm panel. It is also possible to monitor the alarms of distributed systems on a map through the alarm interface.

With four additional alarm inputs, IPG communication platform also acts as an alarm communication hub for other alarms to be triggered by other systems in the organisation such as UPS, fire alarms, burglar alarms or a like.

**SNMP**

IPG communication platform supports Simple Network Management Protocol. For organisations with a varying amount of IT equipment, managing all this equipment with different proprietary interfaces may become too difficult and time consuming. SNMP sets a simple platform for system administrators to manage of all supported devices on IP networks.

**RADIUS / ACTIVE DIRECTORY SUPPORT**

IPG communication platform seamlessly integrates with RADIUS and Active Directory services.

**INTEGRATION WITH LDAP**

Organisations using an LDAP (Lightweight Directory Access Protocol) server do not need to care about creating or updating a separate directory for IPG communication platform, which is compatible with LDAP.

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**SECURITY**

In order to ensure a secure communication platform, Karel IPG series support the following features:

- Encryption (sRTP, TLS)
- Protection against DDOS attacks
- Password aging
- Different administrator account levels

**RTP PROXY – REMOTE IP EXTENSIONS WITHOUT VPN**

Communication with remote IP phones behind a NAT (Network Address Translator) is a common difficulty in VoIP platforms. RTP proxy feature of IPG communication platform allows the system administrators to bridge the VoIP communication between the server and remote IP phones behind a NAT without requiring a VPN (Virtual Private Network).
### ANALOG PHONES

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
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<tbody>
<tr>
<td>TM124</td>
<td>Single Line Telephone; 10 memory keys; wall mountable; message indicator; handsfree; hold; transfer; redial; mute</td>
</tr>
<tr>
<td>TM131</td>
<td>Single Line Telephone with Caller ID; 2 memory keys; power-over-line; received call list up to 80 records; dialed call list up to 10 records; phonebook up to 70 records; handsfree; hold, transfer, redial, mute</td>
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### PROPRIETARY PHONES

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
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<tbody>
<tr>
<td>NT10D</td>
<td>2-line x 20 character display; phonebook up to 50 records; 8 flexible speed dial keys; illuminated handsfree, message warning &amp; mute keys; displays up to 10 call records (dialed/received/missed calls)</td>
</tr>
<tr>
<td>NT30D</td>
<td>8-line x 24 character backlight LCD; adjustable display angle; phonebook up to 120 records; navigator keys (4 directions); 8 function keys for easy access to frequently used features (phonebook, call log, menu, function, redial, conference, park, transfer); handsfree; mute; optional DSS modules with 24 flexible keys (LCD or paper label)</td>
</tr>
<tr>
<td>ST26</td>
<td>4-line x 20 character LCD; phonebook up to 50 records; 16 flexible keys with two-color LEDs for monitoring the status of assigned extensions / lines; 6 function keys for easy access to frequently used features (phonebook, menu, redial, flash, park, transfer); handsfree; mute; optional DSS module with 28 flexible keys</td>
</tr>
<tr>
<td>ST30</td>
<td>8-line x 24 character backlight LCD; adjustable display angle; phonebook up to 50 records; 16 flexible keys with two-color LEDs for monitoring the status of assigned extensions / lines; 6 function keys for easy access to frequently used features (phonebook, menu, redial, flash, park, transfer); handsfree; mute; optional DSS module with 28 flexible keys; optional Bluetooth® support</td>
</tr>
<tr>
<td>FT20</td>
<td>2-line x 20 character or 4-line x 20 character LCD options; phonebook up to 100 records; 16 flexible keys with two color LEDs for monitoring the status of assigned extensions / lines; 6 function keys for easy access to frequently used features (phonebook, menu, redial, flash, park, transfer); handsfree; mute; optional DSS modules with 28 flexible keys or busy display panel (displays status of 200 extensions in single unit)</td>
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### IP PHONE SETS

<table>
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<tr>
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<th>Description</th>
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<tr>
<td>IP121</td>
<td>5-line LCD; two-port 10/100 Ethernet switch; optional PoE support; 1 SIP account; headset support; wall mountable; call &amp; message waiting indication; local 3-way conferencing; phonebook up to 1000 records; 6 feature keys (message, headset, redial, transfer, mute, handsfree); 5 navigation keys</td>
</tr>
<tr>
<td>IP111</td>
<td>HD voice; 5-line LCD; two-port 10/100 Ethernet switch; optional PoE support; up to 2 SIP accounts; headset support; wall mountable; call &amp; message waiting indication; local 3-way conferencing; phonebook up to 1000 records; 6 features keys (message, headset, redial, transfer, mute, handsfree); 6 navigation keys; 2 line keys with LED</td>
</tr>
</tbody>
</table>
## IP PHONE SETS

**IP112**  
HD voice; 5-line LCD; two-port 10/100 Ethernet switch; optional PoE support; up to 3 SIP accounts; headset support; wall mountable; call & message waiting indication; local 3-way conferencing; phonebook up to 300 records; 5 feature keys (message, headset, redial, transfer, handsfree); 6 navigation keys; 3 line keys with LED

**IP116**  
HD voice; 320x160 LCD; two-port 10/100 Ethernet switch; optional PoE support; up to 6 SIP accounts; headset support; call & message waiting indication; local 3-way conferencing; phonebook up to 1000 records; 8 feature keys (message, headset, hold, mute, transfer, redial, conference, handsfree); 16 flexible keys with two color LEDs for monitoring the status of the assigned extensions/lines

**IP136**  
HD voice; dual-port Gigabit Ethernet; 4.3" 480 x 272-pixel color display with backlight; built-in USB port; Bluetooth headset support (through USB Dongle); up to 6 SIP accounts; paper label free design; PoE; headset support; stand with 2 adjustable angles; wall mountable; call & message waiting indication; wallpaper; CID with name, number & photo; 3-way conferencing; phonebook up to 1000 records; 10 line keys with LED; 10 line keys can be programmed up to 27 various features (3-page view); 7 feature keys (message, headset, hold, mute, transfer, redial); handsfree; 6 navigation keys

**IP138**  
HD voice; dual-port Gigabit Ethernet; POE; 7" 800 x 480-pixel color touch screen with backlight; built-in USB port; Bluetooth headset support (through USB Dongle); up to 16 SIP accounts; paper label free design; headset support; wall mountable; call & message waiting indication; wallpaper; CID with name, number & photo; 3-way conferencing; phonebook up to 1000 records; 29 one-touch DSS keys; 7 feature keys (message, headset, hold, mute, transfer, redial); handsfree; 6 navigation keys

**NT32I**  
HD voice; 4-line LCD; two-port 10/100 Ethernet switch; up to 4 SIP accounts; message waiting indicator; 6 speed dial keys; 3-way conferencing; mute; handsfree; phonebook up to 128 records; 4 navigation keys; standard/proprietary IP; optional DSS modules with 24 flexible keys (LCD or paper label)

**NT42I**  
HD voice; TFT LCD display (480x272, 24-bit); touch screen; two-port 10/100 Ethernet switch; up to 4 SIP accounts; message waiting indicator; 3-way conferencing; mute; handsfree; phonebook up to 128 records; 4 navigation keys; standard/proprietary IP; optional DSS modules with 24 flexible keys (LCD or paper label)

**VP116**  
HD voice; 7" digital TFT-LCD, touch screen; 2M rotatable CMOS sensor camera; two-port 10/100 Ethernet switch; up to 4 SIP accounts; 3-way video conferencing; 18 one-touch soft DSS keys; door phone and IP camera application; Picture-in-Picture (PiP); message waiting indicator; phonebook with contact picture; wallpaper; 6 feature keys (mute, camera, phonebook, transfer, redial, handsfree); USB2.0 port; SD card slot

## SOFTPHONE APPLICATION

**YT500**  
YT Series PC/laptop application for various communication requirements such as audio call, video conference, instant messaging and presence. Available in 3 versions with different feature sets: YT510 (audio call, 2 way audio conferencing), YT520 (audio & video call, 3 way audio & 2 way video conferencing), YT530 (audio & video call, 6 way audio & 4 way video conferencing)

**Karel Mobile**  
Softphone client for smartphones and tablets (available for Android and iOS). Turns your smart phone into a full-featured IP softphone of your PBX.
### Wi-Fi Phone

**ICW-1000G**  
SIP-based Wi-Fi phone, allows you to become an extension of Karel PBX and make calls over a wireless network with powerful specifications and features like long-lasting battery, polyphonic MIDI ring / vibration ringer, simultaneous bell & vibration effects, phonebook that supports up to 500 records with 30 groups, 98 speed dial, phonebook search during call, call mute, call hold, CID, CID blocking.

### IP DECT Systems

**DB211**  
IP DECT base station; SIP support, plug-and-play installation, PoE or local power supply, air synchronization, internal multi-directional antenna, maximum 1000 base stations and 10,000 handsets can be used.

**DE242**  
Handset for DB211; GAP-compliant, vibration, wideband audio quality, mute, navigation keys, phonebook for storing 250 entries, central phonebook support.

**DE243**  
Handset for DB211; GAP-compliant, color display, vibration, wideband audio (G.722), mute, navigation keys, phonebook for storing 250 entries, water resistant (Ingress Protection: IP44), central phonebook support, messaging (optional).

**DB260**  
IP DECT base station; SIP support, plug-and-play installation, internal multi-directional antenna, air synchronization, 30 users can be registered in a base, maximum 40 base stations and 200 handsets can be used.

**DR265**  
Repeater for DB260; Extending the DECT coverage, worldwide DECT support, repeater to repeater registration (max. 3 repeaters in daisy chain), handling of 5 active narrow-band calls or 2 active wide-band calls simultaneously.

**DE255**  
Handset for DB260; HD audio support (G.722), 1.44" TFT display (128 x 128), polyphonic ringtones, central phonebook support (LDAP), local phonebook with 50 entries, firmware upgradable over-the-air, wideband speakerphone.

**DE260**  
Handset for DB260; GAP and CAT-iq compliant, color display, vibration, wideband audio (G.722), polyphonic ringtones, headset connector (3.5mm), software update with air synchronization.

### GSM Gateway

**GT40M**  
Provides simultaneous services from 4 different GSM operators with a single terminal, parallel ringing, echo canceller, noise suppression, call diversion, call barring, maximum 256 lines in a single system.
TECHNICAL SPECIFICATIONS

SYSTEM CAPACITY
Independent Switching Units
IPG500: 224 TDM & 500 IP ports
IPG1000: 1056 TDM & 2000 IP ports (with three racks)

Total IPG Platform
3200 IP ports (Server)
3200 TDM ports (Combination of IPG500 and IPG1000 racks)

INTERFACE CARDS
Analog Extension Card (FSK Caller ID)
Analog Line Card (FSK or DTMF Caller ID)
Proprietary Digital Extension Card
Hybrid Card
E1 Line Card (PRI, R2 or QSIG)
E&M Line Card
MGW Card (for the interconnection of IP and TDM ports)
VRC Card (for auto attendant, voice mail and voice logger (call recording))
FOC Card (Fiber Optic Converter with 4 RJ-45 and 1 SC connectors)
FCT Card (GSM Interface Module for Karel GT40M GSM Gateways)
I/O Card (with 2 analog extension ports, alarm inputs, door opener, music source connector, paging port, RS232 port)

PROCESSOR
Stored program control (SPC)
Distributed processor architecture
High system reliability
Optional CPU redundancy (for IPG1000)

HARDWARE SPECIFICATIONS
Ethernet Interface: 10/100/1000 Base-TX
IP Protocols: H. 323 (for lines), SIP (for lines/extensions)
Analog Extension Interface: Caller ID, DP/DTMF signaling, 12 KHz metering pulse generation, polarity reversal, automatic gain adjustment, automatic line control
Analog Line Interface: Caller ID, DP/DTMF signaling, 12/16 KHz metering pulse & polarity reversal detection
E1 Interface: ETSI EN 300 402
PRI ISDN Interface: DSS1 (Q921 & Q931) - ETSI EN 300 403
R2 Digital Interface: DC Loop or Pulse signaling
E&M Interface: Types 1/ 2/3/4/5, 2-wire/4-wire audio connections, wink/immediate/delay start signaling, DP/DTMF number dialing.
USB: 2xUSB 2.0
Power: 48 VDC, max 350 Watt/rack

Connectors: RJ45 (Ethernet, Lines / Extensions), 623K4 (Relay/Music Source), RJ11 (RS232), Pin type-2 pin (External Devices)
Peripherals: Standard Telephones, Karel Feature Phones (FT20), Karel Digital Phones (ST26, ST30, NT30D, NT10D), Karel DSS Modules (DSS20-00, DSS20-28, DSS25-28, DSS3K-24, DSS3L-24), PC/Serial Printer, Alarm, Paging
CRL (Call Record Listing): PC Interface (LAN or PC), Serial Printer Interface

SOFTWARE SPECIFICATIONS
Servers: Embedded Proxy, Registrar, Presence & IM
Operating System: Linux Suse 12.2
CRL Capacity: 7,250,000 (for IPG1000) – 1,000,000 (for IPG500)

PHYSICAL SPECIFICATIONS
IPG500
3U chassis, 19” compatible or wall-mountable
268 (w) x 131 (h) x 387 (d) (mm)
483 (w) x 131 (h) x 387 (d) (mm) (including support brackets)
Weight: 7 kg

IPG1000 (per rack)
19” 3U chassis
440 (w) x 132.5 (h) x 440 (d) (mm)
480 (w) x 132.5 (h) x 462 (d) (mm) (including power supply)
Weight: 10 kg

AMBIENT CONDITIONS
Temperature: -5°C to +40°C, Humidity: 20% to 80%

See Karel manuals for more information.