MD110 Convergence Communications System

Ericsson's MD110 business communi-cation system delivers a new architec-ture to support an increasingly mobile work force. The MD110 is a converged communication system, offering powerful solutions for today's and tomorrow's networks. This unique system combines Ericsson's world-leading expertise in switching, net-works and mobile communications to deliver the benefits that users demand.

The Converged Communications System

MD110 provides the foundations for a converged network where voice, data and multimedia applications all share the same converged IP-based network. A more optimal utilization of available resources is obtained. Furthermore, MD110 offers advanced mobility features making the mobile enterprise a reality. With the Mobile Extensions, mobile phones are integrated into the office system with full access to all serv-ices for the extension. The attendant MD110 is the ideal solution for offices with 50-20,000 people and even more in a networked environment.

ERICSSON ⧫

MD110 may be built with one to four stackable modules, placed side-by-side or back-to-back.

The Mobile Enterprise

With the introduction of the MD110 the grand vision of the Mobile Enterprise has materialized. Mobility through integration of cellular mobile phones (Mobile Extension) or DECT for local radio coverage is available along with the wealth of mobility features and functionality provided on the MD110 platform.

Ericsson's MD110 stands out as an exceptional system that prepares you for the future while providing a cost-effective solution for today's business communication needs. Whatever your requirements are, today or tomorrow, an MD110 solution will exceed your expectations. Today, there are more than 20 million business users who rely on the MD110 and who have placed their confidence in Ericsson to protect their investment in the future through continuous system enhancements.

Full-blown IP Telephony

Uncompromised telephony functionality is a prerequisite when applying telephony over the IP-network. This implies full telephony feature richness as well as mechanisms to guarantee, monitor and present voice quality.

MD110, in the latest release, offers a full-blown IP telephony solution. Both IP extensions and IP networking with peer-to-peer switching are offered. You can go for an all out IP telephony solution for your organization while maintaining all the advanced telephony functionality of one of the world's most renowned PBX-systems.

Furthermore, MD110 is an excellent choice if you want to start introducing IP telephony on a small scale and expand later. MD110 already possesses an outstanding functionality for the circuit switch telephony world. Now, MD110 can also constitute the bridge between the circuit world and the new packet oriented IP-world. This means that you can introduce IP telephony by adding the functionality to your existing system and introduce IP telephony on a departmental basis. Gradually, IP Telephony can be expanded at your own pace and under your own control while keeping cost and operational efficiency in the foreground. Fully supported by MD110, you can switch to 100 percent IP telephony, making a graceful convergence under your own control a reality. The clear migration path of MD110 is also a major asset in this context. In the constantly upgraded MD110, IP telephony has been gradually and gracefully introduced. Subsequent steps include a server-based solution based on open software.

The Distributed Concept of MD110

The cornerstone of MD110 is its distributed architecture. The system is built around self-contained modules, which are interconnected to create systems of up to 30,000 extensions. The basic module is called a Line Interface Module (LIM). The LIMs are distributed via traditional 2 mbit links, but can be as easily distributed over an IP network. A LIM can be located in branch-node office and connected via an IP-connection to the main office and the other LIMs in the same system.

Each LIM is totally self-supporting with its own software and hardware including all device units. The processing power is fully distributed. All telephony and system features are fully transparent.
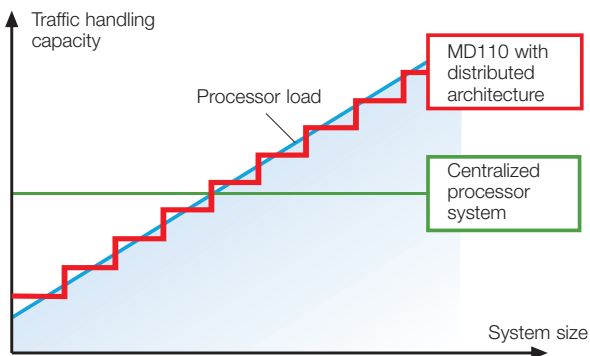
MD110 distributed architecture provides flexible processor power, allowing you to dimension traffic handling capacity and system size to exactly match your requirements.

Power Consumption

	Internal power	External power
Alternative solution per fully equipped stack, including digital telephones	150 – 1,400 W	150 – 1,800 W
Heat dissipation per fully equipped stack, including digital telephones	115 – 180 W	115 – 350 W

Dimensions and Weight

	1 module	*2 modules*	*3 modules*	*4 modules*
Height (mm/in)	630/24.8	1030/40.5	1430/56.3	1830/72.0
Width (mm/in)	598/23.5	598/23.5	598/23.5	598/23.5
Depth (mm/in)	355/14.0	355/14.0	355/14.0	355/14.0
Weight (kg/lbs)	45/99	85/187	125/275	165/363

Key Characteristics

These key design principles and the modular system structure give the MD110 its unique benchmarks and provide customers with benefits in terms of:

- Scalability
- Flexibility
- Reliability and availability
- Decentralization
- Migration and upgrading

Scalability

The modular and distributed concept makes MD110 extremely scalable. You can start with a small system and upgrade as the need arises.

You can easily reconfigure your system to your preferences. Thanks to the modular concept, you can move equipment from one site, where activity is decreasing, to a site that is expanding. Investments already made are protected and new expenditure is avoided.

Flexibility

With distributed processing and switching, there is always enough power in the system to provide the required performance to end-users in an optimized manner, independent of system size.

Reliability and Availability

Since full processing and switching power is distributed to all LIMs, a fault in hardware or software only affects services within the malfunctioning LIM,

not the entire system. The processing and switching power in the LIMs may optionally be duplicated to ensure even greater reliability. Similarly the Group Switch may be fully duplicated.

Distributed System on the Premises or Campus

The modules can be flexibly distributed over a campus or office area, maintaining 100 percent feature transparency. This is now also true for an IP-environment.

Migration and Upgrading

A major asset of MD110 is its ability to absorb new technology. Every MD110 installation can always be upgraded to the latest release. This also holds true when IP technology is introduced.

System Functionality

Mobile Extension – integration of cellular mobile phones

Wireless access allowing you to travel around and still be able to be reached is a fundamental element of mobility.

But supporting mobile behavior requires much more. You need access, but you also need applications, services, support and flexibility.

The MD110 Mobile Extension is a unique function, fully integrated into the software of the MD110. This extension will bring you both wireless access and the services needed to allow your employees to become truly mobile.

A mobile subscriber, be it 2G, 2.5G or 3G or any standard GSM, CDMA,

DAMPS or UMTS, can be made an extension in MD110. The same applies to any fixed line subscription supporting touch-tone signaling and calling line identification. This means that today's frustration of not having full access to the corporate network when using the cellular phone or when out of the office is eliminated.

The mobile extension is more than just call forwarding. For your secretary, for your operators, for your colleagues and for any incoming calls you are simply another MD110 extension. This means that services such as abbreviated dialing, camp-on, intrusion, callback or conference all work for both the mobile user and the other MD110 users.
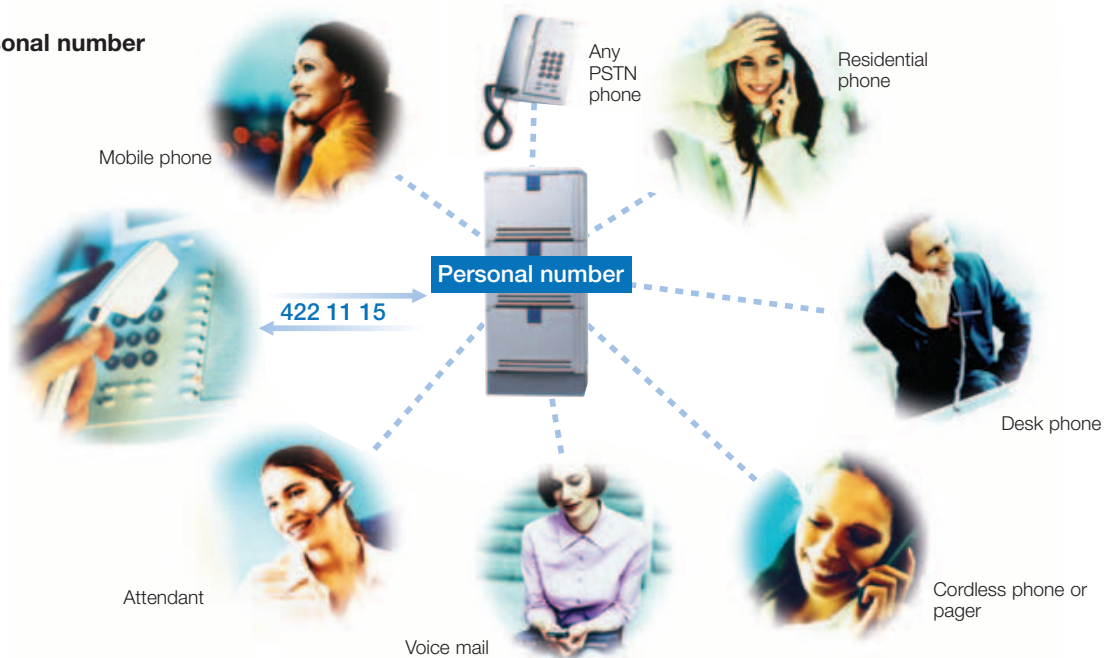
Telephony over IP

The IP Telephony in MD110 is based on the H.323-standard. It offers the same advanced functionality as MD110 always has offered. Full support is provided for business operations.

The implementation is based on peer-to-peer switching, thereby avoiding all unnecessary gateways, strengthening efficient use of the network and improving voice quality. This applies both on the internal extension side and the networking side.

The very strong networking functionality of MD110 has been extended to an IP-environment. Peer-to-peer switching is available via connections throughout the entire network ensuring efficient use of available bandwidth. No inefficient gateways are used within the IP-network. The inherent distributed architecture makes MD110 the ideal networking solution for an IP scenario.

Personal number

Mobile phone

Any PSTN phone

Residential phone

Personal number

422 11 15

Desk phone

Attendant

Voice mail

Cordless phone or pager

To ensure voice quality, priority mechanisms need to be supported both in the underlying IP-network and in the telephony application. MD110 includes the appropriate mechanisms. Traffic data delays, jitter and packet loss are reported for each telephony session. To ensure that real-time traffic is prioritized, standards like DiffServ and 802.1p are supported.

Ericsson Communication Client – the easy to use IP phone client

Bundled with the Ericsson Communication Client (ECC) comes client software with which you can make and receive calls directly from your PC just as easily as from your office phone. All you need, in addition to a headset, a microphone and a sound card, is to be connected to your corporate LAN/WAN. From its easy-to-use graphical user interface it is also possible to have access to the corporate directory and manage your message diversions and personal profile. Using ECC office assistants you can even monitor and perform call handling for other users (MD110 extensions).

Cordless Mobility with DECT

The integrated cordless phone (DECT) solution takes full advantage of the distributed MD110 architecture and supports up to 30,000 cordless users in one system.

Users are thus mobile anywhere in the coverage area of the office base stations, which may include multiple sites. Roaming and seamless handover are supported by the system. With the MD110 Personal Number service, mobility can be enhanced to entail other systems in the company net-

work, allowing the cordless phone users to respond to business calls wherever they are.

Alarm Messaging

MD110 offers the possibility of building DECT-based Short Message Services (SMS), thus enabling transmission of text messages from or to the cordless terminals. Messages can also be generated automatically based on events or alarms. Customized applications can be made for a variety of connections, including the Internet or other external interfaces such as e-mail, alarm inputs or contacts. These applications are intended for organizations that need to alert special teams, for example, in case of an emergency. Typical environments for these applications are production plants, the processing industry and hospitals – in general, organizations where the staff may need to be alerted in case of emergency. In hotels, guests or managers can send urgent messages to service personnel when an immediate response is required. It can also be used the other way around.

Cordless phones equipped with alarm functions can send alarm messages to the messaging modules. It is now also possible to add the location of the host base station, that is, the base station the cordless phone is registered on at the moment the alarm is generated. The user can either manually add the location information or an approximate position can be given by the host base station.

### Personal Number – one number on your business card

Callers do not have to search for the called person on home, mobile and office phones. Instead, they simply have to remember one personal number.

Personal Number is an enterprise service for mobile communications that combines different access methods (wired extensions, business cordless, cellular, PSTN, pager, voice mail and colleagues or assistants) with a new generation of personal services to support mobility and to help users manage their calls.

The Personal Number service keeps track of where to locate the user. Each user may have up to five personal profiles, which may be activated according to the situation—in the office, traveling or at home. The profile determines what happens to incoming calls and which calls will be forwarded to different telephones in a predefined order or transferred to a back-up service. Users may activate a specific profile via a dial-up service over the telephone, over the Internet using the web based Ericsson Communication Assistant, using a mobile phone with the WAP based DNA Mobile Executive or the IP SoftPhone client, or the Ericsson Communication Client user interface. Personal Number is a system function in the MD110 software, available throughout the system.

Free Seating – log on to any phone

Free Seating or "desk sharing" targets the needs of companies with a mobile workforce which only occasionally works from the office. A typical example would be a consulting company.
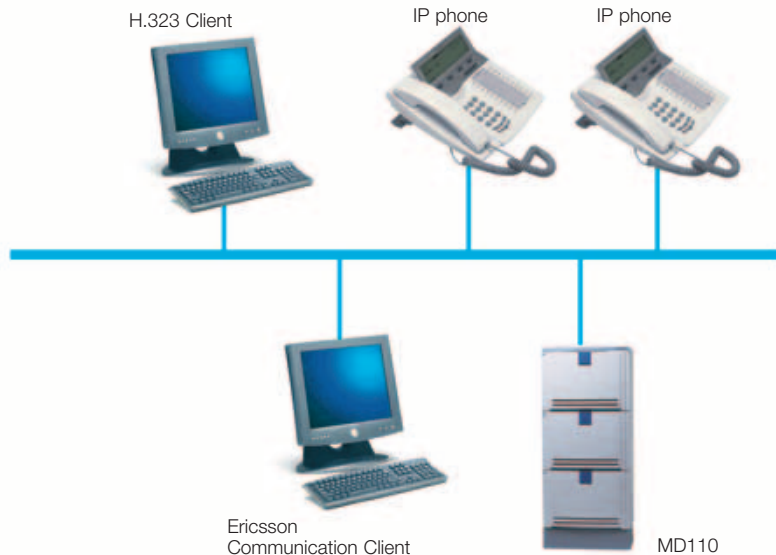
IP Telephony in the Office

When free-seating users need to work from the office, they simply log on to any free telephone. This telephone then has the toll-bearing class, message waiting indications and a call log of all outgoing calls for that logged-on user. When calls are made from this telephone, the user's name and number are displayed to the called parties.

Incoming callers will only see the virtual number and name (not the telephone that the user is seated at). Upon leaving the office the user simply logs out.

Dialog 4425 IP Vision

Sony Ericsson T68i

Integrated Voice Mail

The MD110 communications system offers integrated voice mail functionality as a system option. Each card supports up to 300 mailboxes and 16 simultaneous sessions. Up to 72 hours of voice-mail messages can be stored on a separate memory card. The functionality includes storing, scrolling, retrieving and deleting messages. Users may record personal greetings.

Dialog 4000 Telephones

The new set of desktop terminals—the Dialog 4000 telephones—consist of several models using different technologies and to meet various needs: Digital telephones (DTS) supporting MD110 proprietary 2B+D including the attendant version (Operator), IP telephones with built-in Ethernet switch and a range of analog phones.

MD110 supports a sophisticated user interface where frequently used services are easily accessible and where the user is guided through the procedures needed to use these services. Since commonly used services such as setting up a conference or making a call transfer are user-friendly, risk of losing a call is virtually eliminated. Call list and a phone book are accessible from the display menu.

Ericsson Communication Assistant (ECA) – control your calls

Handling of calls can be made an easier task for the end-user with ECA, Ericsson Communication Assistant. Call handling for any MD110 extension, whether it is analog, digital, cordless, mobile or IP, becomes easier as functions and services become accessible through a Web browser.

Calls can be handled straight from the directory. The ECA also facilitates setting up the Personal Number profile. Services like call scheduling and message diverting can also be performed on screen.

Networking

The MD110 is specially designed to provide the foundation for a unified network that supports integrated voice, data and multimedia applications. Full transparency throughout the network and across multiple sites for all voice, data and multimedia services has always been a defining feature of the MD110.

Full QSIG-based networking functionality is available. Networking now also includes feature transparency with BusinessPhone via an IP connection.

Please refer to the datasheet 'MD110 Networking' for a detailed description of the MD110 networking functionalities.

From Call Center to Contact Center

The MD110 with Automatic Call Distribution (ACD) software provides an ideal platform for large organizations that handle hundreds or thousands of calls daily. This function not only routes incoming calls to the correct person and department but also organizes extensions into call groups, which may be in the same office or in different locations.

Depending on your requirements, various options are available for call-group supervisors and agents, including Call Center Manager and Agent Desktop applications. The call center solutions

The illustration shows an example of how the stackable modules can be arranged for a 3-LIM exchange.

from Ericsson Enterprise are the traditional MD110 call center and the state-of-the-art contact center Solidus eCare™.

Open Interfaces

Open interfaces make it possible to supplement MD110 with numerous applications, developed by us or together with or by third parties. Examples are call center solutions, unified messaging and customer-specific developments. In the latest release, SMS-based alarm messaging can be added to the list of applications. MD110 supports all generally available standards like CTI/CSTA, TAPI and TSAPI. A number of specific open interfaces are also available for the development of applications by third parties. Examples are billing systems, voice mail and operator support systems. Connectivity is normally provided over IP/Ethernet, in some cases V.24 is used.

Network Administration

The management system for the entire network is based on industry standards such as SNMP (Simple Network

Management Protocol) for fault handling. The connection to MD110 is made via TCP/IP over LAN or PPP over a modem connection. Management tools provided by the Dynamic Network Administration suite (D.N.A.) include Directory Manager, Extension Manager, Performance Manager, Node Manager and Event Manager, as well as the D.N.A. server, which is common to all applications.

Module Mechanical Structure of MD110

The MD110 is built on a modular mechanical structure that allows a high degree of flexibility. The mechanical structure is based on stackable modules that can be mounted in a number of ways in order to adapt an installation to the available room or floor space.

The modules can be mounted on top of each other, adapting the height to the ceiling. If preferable, the modules can be wall-mounted, separately or side-by-side. It is also possible to mount modules on a wall at a distance from each other, so that they blend with the interior décor of the room.

Dimensions and weight
(with cover)

Height: (mm/in.)	460/18.1
Width: (mm/in.)	598/23.5
Depth: (mm/in.)	355/14
Weight: (excl. batteries)	35 kg (77 lbs.)
(incl. batteries)	55 kg (121 lbs.)

Power consumption

1 cabinet	320 VA
2 cabinets	640 VA
Heat dissipation:	70–120 W per Cabinet

MD110 is prepackaged for small to medium-sized companies and branch offices.

Technical Specifications

When delivered, MD110 is automatically configured to a complete system according to customer specifications. The modules included in this configuration are:

MD110 modules

PSM – Processor Switch Module

- Common control, including processing, switching (1,024 time slots), and OS/AS (Operating System/Application Software)

- Flash memory or hard disk software back-up media

- 10 free accessible universal board positions for interfaces of any type of internal or external access

- Interface for S&NM

IFM – Interface Module

- Switching for 256 time slots

- 17 free accessible board positions

PWM – Power Module

- 2 x 12.5 A x 48 V (nominal) 1,200 W

- Cost-effective power for up to 600 digital extensions

- One PWM can support up to four modules (PSM or IFM)

- Built in

PBM – Power Back-up Module

- 2 x 26 Ah

OAM – Optional Application Module

- An empty module for optional hardware or other applications using 19-in. building practice

GSM – Group Switch Module

- Built-in magazine for a maximum of 31 MD110 PBX feature links. The Group Switch can be expanded to a maximum of 8 GSM modules

Typical MD110 All-Contained Module Configurations[1]

Stand-alone or branch node	1 cabinet	2 cabinets
Digital trunks	30	60
Analog + digital extensions	80 + 16	192 + 16
Cordless + analog + digital extensions	170 + 16 + 16	340 + 32 + 132
Analog trunks	16	40
Analog + digital extensions	80 + 16	170 + 16
Cordless + analog + digital extensions	170 + 16 + 16	340 + 32 + 32
Campus node or building hub	1 cabinet	
Feature links/channels	2/60	
Analog + digital extensions	80 + 16	
Cordless + analog + digital extensions	160 + 16 + 16	

1) The stand-alone configuration includes interface boards for S&NM and a hard-disk unit for software back-up.

PDM – Power Distribution Module for External Power

• Includes current limiting units for 10, 20 or 30 modules

ACM – All Contained Module

• Contains both the PSM, power supply and battery back-up. In the ACM, the power supply, cable chute and batteries are mounted in the base to make optimal use of space.

MDM – Main Distribution Module

• A small-system internal MDF alternative to the external MDF. The module capacity is 416 lines on the exchange side (digital and/or analog telephone and/or trunk line extensions) and 520 lines on the line side of the MDF.

Mains supply

115–230 V AC, ±15%, 50 – 60 Hz

Complies with IEC 950

Storage

DRAM. Integrated Flash memory or hard disk for memory back-up.

Environment data

During operation

Temperature:	+5°C – +40°C (41°F – 104°F)
Relative humidity:	20 – 80%

No forced cooling required.

Line protection

Interface protected by transformers.

Analog extension line data

Current feed resistance
  2x400 ohms, 48V

Loop resistance
  1,800 ohms, including telephone

Recall button signaling
  Timed break pulse or grounding one speech wire

Digital extension line data

Two wires
  Line length 1,000 m (3,280 ft.)

Switching network
  Time Division Multiplex (TDM)

Single-stage physical non-blocking switch

Analog trunk-line data

Loop resistance

Lines to public exchange
  1,800 ohms

Tie lines   2,000 ohms

Transmission data

Market adaptable impedance and relative levels

Coding
  A-law PCM coding according to CCITT G.711

Crosstalk attenuation
  According to CCITT Q.517

Multi-node networking

Full facility transparency using feature link, standard 2 Mb, PCM, G.703

MD110 configurations

LIM consisting of a typical stack of 4 modules can support up to 640 extensions (cordless, digital or analog) or up to 1000 users with Mobile Extension or IP extensions and 256 trunk lines.

MD110 application servers

The MD110 PBX has a modern system architecture that supports the connection of special purpose servers for such applications as voice mail, mobility services (Business Personal Communication Services) and other equipment for group functions.

VoIP

Codecs	G.711, G.729a, G.729ab, GSM efr
RTCP	IETF RFC 3550
QoS packet prioritization/tagging	TOS/DiffServ, IEEE802.1p&q
Ethernet Interface	10/100 Mbit (Autosense)
H.323 V2	According to ITU-standard H.323.

Visit us on our website
www.ericsson.com/enterprise