The VoiceSaver/Ericsson MD-110

Project Memorandum

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INTRODUCTION

This guide provides support for the integration of the VoiceSaver™ Voice Massaging System, with the Ericsson MD-110 Private Branch Exchange. The integration procedures described in this guide are strictly based on the SMDI interface between the VoiceSaver™ and the MD-110 switch, via an RS-232 Serial Communication Port.

This guide is intended for the System Programmer or the System Administrator and it is assumed that he is already familiar with the terminology and concept described in the integration and the MD-110 programming process.

This guide also includes a Hardware Connectivity Section which intends to provide a step by step strategic approach to the installation and hardware configuration of the VoiceSaver™ and Ericsson MD-110.

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1. Overview

The VoiceSaver™ integrates with the Ericsson MD-110 via an RS-232 Serial Communication Port to facilitate the use of the VoiceSaver™ Automated Attendant feature. This document will explicitly describe the theory related to the process.

The serial communication between the VoiceSaver™ and the Ericsson MD-110

the communication protocols and sequences, used between the VoiceSaver™ and the Ericsson MD-110, are also implied in a separate section. This section also describes the structure of every communication protocol transmitted by the Ericsson MD-110.

In addition to the RS-232 serial communication, the automated attendant feature of the VoiceSaver™ can also be utilized by the Ericsson MD-110 by the ACCUCALL call progress recognition utility. For a step by step guide to this process refer to the VoiceSaver™/Accucall Guide.

2. Hardware Installation

VoiceSaver™

The following description will direct you through a step by step guide for the VoiceSaver™ and hardware installation into the voicemail PC. You will need to install the following in the VoiceSaver™ System:

i.   Power-Off the voicemail system and remove the cover on the PC.

ii.   Set the I/O Port Address and the IRQ on the Rhetorex/Dialogic Voice Board. (Address=300 for 1st Board, IRQ=5).

iii.   Insert the Rhetorex/Dialogic Voice Processing Board in an appropriate 8-Bit or 16-Bit slot and tighten the board securely into the PC.

iv.   Replace the cover on the voicemail PC.

v.   Connect the single line RJ-14 cables from the Ericsson MD-110 to the back of the Rhetorex/Dialogic Voice Board.

vi.   Power-On the system and boot up to the dos prompt.

QDLE (Programming/Interception Computer)

The following steps will guide you through the Hardware Installation of the Interception Computer used for the Ericsson MD-110 programming.

i.   Power-Off the QDLE Interception Computer and remove the cover on the PC.

ii.   Set the I/O Port Address on the QDLE Board (Default=258H, see the Ericsson MD-110 Extra Facility Manual for details).

iii.   Insert the QDLE Board in an appropriate 16-Bit slot in the Interception Computer and tighten the board securely.

iv. Make sure that COMPORT-1 (COM-1) in the Interception Computer is enabled.

v. Replace the cover, and connect the Power, Monitor and Keyboard connections to the system.

vi. Connect the QDLE PC-Backup data cable from the Ericsson MD-110 IOU Board (ROF 131828/2) to the QDLE Board in the Interception Computer.

vii. Connect the Serial Port cable from the Ericsson MD-110 IOU Board to COM-1 on the Interception Computer. This cable is connected to the Lower Connector (Pins 17-32) on the ROF 131828/2 Board in the MD-110.

viii. Power-On the Interception Computer and bring up the QDLE386 software by typing:

QDLE386/A   < enter >

x. Set the Com-Port settings by < ALT-P > and save them.

xi. Initialize the MD-110 load sequence from the PBX switch. (Section IV)

3. Software Installation

i. To install the VoiceSaver™ voice massaging system into your voicemail PC, insert the disk labelled VoiceSaver™ Program Disk 1/2 into drive A: and type;

A:INSTALL   < enter >

ii. The install program will ask you several questions before beginning the installation process.

iii. You will then be prompted to insert the VoiceSaver™ Prompts Disk 2/2 into drive A: and to conclude the installation process you will again be prompted for the VoiceSaver™ Program Disk 1/2.

iv.   Make sure that the CONFIG.SYS file in the system has the following statements;

FILES=40
BUFFERS=12

These values are the minimum requirements for a 4-Port VoiceSaver™ system and can be set to higher values relating to the number of ports in the system.

v.   To bring up the VoiceSaver™ program, reboot the system and type;

VT

at the DOS prompt, in the program sub-directory. The screen should display the status for each active port.

4. Ericsson MD-110

The following is a description of the hardware connections between the Ericsson MD-110, the QDLE Interception Computer and VoiceSaver™ Voice Massaging System. All connections between these systems are described in a step-by-step procedure.

The following terminology is used:

(a)   **Single Line Card (ELU11) ROF 137 5216/4**

Ericsson MD-110 hardware that handles all the Single Line Keysets connected to the MD-110.

(b)   **ICU (SMDI Interface Unit) ROF 131 4421/2**

The ICU board transmits and receives all the SMDI data between the Voicemail Computer and the Ericsson MD-110. For example the call re-direction code and the mailbox information.

(c)   IOU (Programming and Interception Computer Interface) ROF 131828/2

The IOU board communicates with the Interception Terminal with MICROSIS FIOL or QDLE386 software. This board connects to the Interception Computer via the RS-232 Serial Port and the QDLE 50-Pin Connector.

(d)   Digital Keyset Card (ELU5) ROF 131833/5

Ericsson MD-110 hardware that handles all the Digital and Multiline Keysets connected to the MD-110.

(e)   LPU2 ROF 131 4228/5

This board initiates the software loading and start-up process for the MD-110 from the QDLE PC-Backup system. The start-up process is initialized by pressing the button on the LPU2 board twice.

(f)   Interception Computer

The Programming Computer that is installed with the QDLE Board and Software or the MICROSIS FIOL Software, and is connected to the Ericsson MD-110 via an RS-232 Serial Communication Port and the QDLE Board Interface Connector.

(g)   SMDI Interface and Information Computer

The Voicemail SMDI Computer that receives information containing the call re-direction code and the mailbox number from the MD-110 and takes a message for the appropriate mailbox. This interface is also used to turn on and off the Message Waiting indication if the MD-110 is programmed to activate the feature.

(h)   QDLE PC-Backup/Microsis Fiol

The Interception System software that contributes to the programming and maintenance of the Ericsson MD-110 features. The QDLE or FIOL programs are installed the system that has the QDLE hardware in it.
The communication between the Interception System and the MD-110 takes place on twin platforms protocol;
- the QDLE hardware connections to the Ericsson IOU board (ROF131828/2) and
- the standard RS-232 serial communication protocol.

(i)   Signalling Channel and RS-232 Communication

The RS-232 is a set of standards specifying various communication characteristics between the Interception System, the Ericsson MD-110 and the VoiceSaver™ Voice Massaging System. The VoiceSaver™ and MD-110 are connected via an RS-232 connection scheme, which here is also referred to as a Signalling Channel (V.24 Interface).

(j)   Single Line Keysets

Telephone instruments for the Ericsson MD-110 which can access only one line at a time. All special features of the MD-110 are accessed in these sets by using specific numeric codes, since they have no special keys.

Digital Keysets

A full-featured digital key telephone unit that connects to the Keyset card on the MD-110. The digital keyset has a number of additional keys to access the special features of the MD-110.

Message Waiting Light

An LED indication on the digital or single line keyset that is turned-on by the voicemail or the switch operator whenever the owner of that extension has a new message. This message can also be in the voicemail box related to the extension.

(m)   Mailbox and Subscriber

A term used in the voicemail system, that refers to an area in the system storage assigned to a specific voicemail user. This area can be accessed by the subscriber or voicemail user by a unique passcode to retrieve his messages.

(n)   SMDI - Information Strings

The information transmitted from the Signalling Channel on the MD-110 via an RS-232 port. This information is a string of digits containing the mailbox number, the re-direction code, port number being used for the transferred call, etc.

Hardware Installation and Integration

1. Connects all the cards in the Ericsson MD-110 and install the Digital Multi-line and the Single Line Keysets to the switch.

2. Connect the QDLE data cable from the top section of the IOU board connector (pins 01 through 32) to the QDLE hardware in the Interception or Programming Computer.

3. Connect the RS-232 serial cable from the bottom section of the IOU board (pins 17 through 32) to the Communication Port in the Interception or Programming Computer. This cable carries out all the command ordered from the Interception Computer to program the MD-110.

4. Make sure the VoiceSaver™ Voice Massaging System is turned on and ready to receive calls. Now connect the RS-232 serial communication cable from the ICU board (ROF 131 4421/2) on the Ericsson MD-110 to **COM PORT 1** on the VoiceSaver™ Voice Massaging System. This connection will relay all the SMDI information between the VoiceSaver™ and the Ericsson MD-110.

5. Power-on the Ericsson MD-110 from the Main Power Source and all the switches on the MD-110 itself.

6. Initiate the Ericsson MD-110 software load sequence from the Interception Computer with the QDLE386 software or the Microsis FIOL program. (Refer to the Software configuration and Loading section)

Software Configuration and Load Sequence

1. Using QDLE386 as the programming software and the MD-110 loading utility, in your Interception/Programming Computer make a sub-directory and called "QDLE".

2. Install the QDLE386 software into the Interception Computer, in the QDLE sub-directory.

3. Bring up the QDLE software by typing the following in the QDLE sub-directory:

    QDLE386/A < enter >

    at the DOS prompt.

4. Access the QDLE software configurations menu by pressing < Alt-H >.
    Now, set the software COM PORT configurations and other hardware/software settings, this is done by pressing < Alt-P >. Save the settings and exit the configuration mode.

    Once the QDLE software is set to the appropriate hardware/software configuration, start the MD-110 software load sequence.

    Make sure all the power sources are ON in the Ericsson MD-110 system. Confirm that the QDLE software is loaded and active in the Interception/Programming Computer. Re-check all the connections from the MD-110 to the Interception Computer and the VoiceSaver™ Voice Massaging System.

    After powering-on the MD-110, press the Button on the LPU2 board TWICE. The Red LED on the LPU2 board will light-up and the Hard Disk LED on the Interception Computer will signify that the software is being loaded onto the MD-110. The end of the load is indicated by the turning-off of the Red LED on the LPU2 board.

    NOTE: When the load sequence is complete, it can be verified by the functioning of the keysets. All keysets will a Dial Tone only after the load is complete.

5. VoiceSaver/Ericsson Integration Programming

To integrate the VoiceSaver™ with the MD-110, the Ericsson MD-110 has to programmed to activate the voicemail function in the switch. This procedure is described in the following paragraph:

1. After completing the MD-110 load sequence, log into the QDLE-110 programming mode. Load the QDLE software, (see Software Configuration & Load Sequence, Step #3).

2. Set and activate the COM 1 serial port in the QDLE software, (see Software Configurations....., Step #4).

3. After setting the COM Port, observe the following procedure to login into the MD-110 programming mode and obtain the System Ready prompt:

   (a) Turn on the NUM LOCK key on the Keyboard.

   (b) At the QDLE screen, Press the "S" key and hold it down until a string of S's appear on the command line, (approximately 10-12 "S" characters). End the string by a semi-colon and press <Enter>.
   Note: All Command lines and Statements used in Ericsson MD-110 programming should be ended with a Semi-Colon.

   (c) When prompted for a Passcode, enter HELP; or your valid passcode. (Please note that the passcode is ended with a semi-colon, "HELP;")

   (d) After the passcode is validated, the system is now ready to receive addition programming commands. The system ready prompt will be ">".

4. At the System Ready prompt type in the following command line to initiate the ICU Individual Port connecting the MD-110 to the Interception or Programming Computer. Use the ICFUI; command with the following parameters to initiate the ICU port:

ICFUI:ICUIND=,EQU=,RATE=,DFMT=,UPDFCN=,PARITY=,CCHECK=,TXC=;

The values applied to these parameters are:

ICUIND=0
EQU=1-0-30-00
RATE=1200
DFMT=3
UPDFCN=YES
PARITY=EVEN
CCHECK=YES
TXC=NO   (End the command line by a semi-colon, ";")

5. The next step is to initiate the voicemail function in the Ericsson MD-110. In order to do this the following command is ordered:

VMFUI:ICUIND=;VMF=,POFMT=;

The values applied to these parameters are:

ICUIND=0
VMFUI=EXTND
POFMT=2 **(End the command line by a semi-colon, ";")**

Note: This command initiates the MD-110 voicemail function in EXTENDED mode.

6. Next, assign and initiate the voicemail extension (directory number) and the voicemail port number. The command line for this program will be:

VMPOI:DIR=,PORT=;

The values applied to these parameters are:

DIR=103 **(or your desired voicemail extension)**
PORT=01 **(or the desired voicemail port to be assigned)**

(In this command line, extension 103 has been assigned as the voicemail port number 1).

7. Now verify the RS-232 serial SMDI connection between the MD-110 and the VoiceSaver™ voicemail system. Use the following command:

ICUPI; (No parameters are used)

This command, if successfully transmitted, returns with a confirmation message that prompts:

ORDERED

This serial communication port is now usable for exchange of SMDI information containing mailbox and call transfer information, between the MD-110 and the VoiceSaver™.

8. Since the voicemail function in the MD-110 has been successfully initiated, you can now order diversion commands and assign DIVERTEE positions for all voicemail subscribers. The command used to assign these positions will be:

CDINI:DIR=100,DIV=103;

Here, the divertee position assigned for extension 100 is the voicemail extension 103. Therefore all calls diverted from extension 100 will be forwarded to the voicemail extension 103 (voicemail port number 1). This diverted call will be accompanied SMDI data transmitted via the serial port.

8. ACCUCALL

Generating a tone-table using the Accucall Plus utility

INTRODUCTION

The following memorandum explains the complete process of generating a table of call progress tones on the Rhetorex voice processing boards with the help of the Accucall Plus call progress training utility.

CONCEPT OF APPLICATION

The basic and most common theory behind the working of any call progress monitoring equipment depends on the tones received, which were generated by the Key System, Telephone Switch or the Central Office switch as a result of the call progress session.

The Accucall Plus call progression utility uses these progress tones to generate a tone-table. This tone-table is then used by the Rhetorex voice board driver to identify and recognize the different states of the call. According to the tones received and the "State of Call" declared, the voice driver gives a PCPM identification code to the voice processing software. The voice processing software then handles the call appropriately, based on the PCPM code received.

GETTING STARTED

Before you start to work with the Accucall Plus utility, please verify the different kinds of tones that your telephone system (PBX, Key System or Central Office) generates to specify the status of the call. The most common types of tones generated by different telephone systems are, Standard Busy, Standard Ring, Fast-Busy, Dual-Ring, DND (Do not disturb).

SETTING UP FOR TONE RECOGNITION

To make Accucall Plus capable of recognizing the different types of progress tones generated by the Key System Source or the Central Office, there might be a need to adjust some parameters in the Accucall Plus utility software. A detailed description of some important parameters to be adjusted is explained in the step-by-step procedure guide.

GENERAL SETUP AND THE ACCUCALL PROCESS

The first step for general setup is to insert a Rhetorex voice processing board in the voicemail PC and load the appropriate Rhetorex voice driver. This is done by typing; RHETDRV, at the DOS prompt. Also, verify that an RJ-11 or an RJ-14, single-line telephone cable from the Key System source or the Central Office is connected to the jack at the rear of the Rhetorex voice processing board. The system is now set to run Accucall Plus.

Please observe the following steps;

STEP 1:   At the DOS prompt type; ACCUCALL   <enter>
You will now be at the Accucall main menu with the following choices;

F1	HELP
F2	RUN
F3	FILTERS
F4	-----
F5	SETUP
F6	AUTO-RUN
F7	FILE
F8	EDIT TONES
F9	-----
F10	EXIT

STEP 2:   The initial step is to configure the voice board and identify it to the Accucall Plus software. To do this, at the main menu press <F5> for SETUP. Set the voice board hardware interrupt level or the IRQ Level to 5.

STEP 3:   Next, set the parameters to successfully log all results to your hard disk. (set "LOG RESULTS TO DISK" to "YES". Note: the <Spacebar> toggles the through the available selections.

STEP 4:   Specify a valid telephone number or extension number in the PHONE NO. field to be used by Accucall Plus to determine the call progress tones.

STEP 5: For certain call progress tones there might be a need to adjust the **SPIKE** and **GLITCH** values in the channel parameters. The default values for the these parameters are:
GLITCH   150
SPIKE   190
The GLITCH parameter sets the limit for the minimum level of silence that must be detected for a valid OFF CADENCE, and the SPIKE parameter sets the limit for a valid ON CADENCE to be detected.

STEP 6: Check the default values of all the parameters and save the current parameter settings by pressing <F7>.

STEP 7: Switch to the AUTO-RUN mode by pressing <F6>, and verify that you have a valid outdial phone number mentioned in the AUTO-RUN setup. (derived from the <F5> setup screen)

STEP 8: Make sure that the phone number mentioned in the AUTO-RUN setup is in ON-HOOK position, and then press <F9> to start calling. This will start the frequency scan for the "No Answer Ring" Tone.

Monitor the CADENCE window on the right side of the AUTO-RUN screen, and determine if the ring pattern has a uniform structure. This information will be used in the subsequent procedures.

Note: If you get an error message after pressing <F9>, please check that the phone line is connected to the correct port number on the Rhetorex board. Also check your outdial channel number setting in the <F5> setup screen.

STEP 9: When the frequency scan for the Ring Tone is completed, you will be prompted to press <F8> to save this tone table.

STEP 10:   Press <F8>. Assign a temporary name for the "Ring Tone", (e.g; Panaring etc). Check the tone TYPE in the graphical display and verify if the graphic shape matches with the type of tone detected. If the ring pattern detected in the CADENCE window was uniform, then set CADENCE to YES. This makes the call progress monitor capable of determining the tone by analyzing only the cadence, and the frequency can be ignored. Set the PCPM Code to 8 for a ring tone. The PCPM identification code is used by the voice processing software to determine the "State of the Call".

STEP 11:   Save the tone setup by pressing <F8>. You will be prompted to press <F8> again to confirm the action. After saving the ring tone, return to the AUTO-RUN mode by pressing <F6>.

STEP 12:   Now put the same phone in the OFF-HOOK position to create a "Busy" situation, and press <F9> to start the frequency scan.

STEP 13:   After the frequency scan has completed, press <F8> to go to "Save Setup" screen.

STEP 14:   Follow the same procedures as for saving the ring tone. Assign a unique name for the "Busy Tone" (e.g; Panabusy or ESPbusy etc.) The CADENCE should be set to yes if the frequency scan detected was uniform. Set the PCPM identification code to 7 for busy tone, and save these values by pressing <F8>.

STEP 15:   If your telephone system has the DND (Do Not Disturb) feature, and generates a unique tone for a DND situation, then follow the same procedure to detect a DND tone on the test phone set. On the save setup screen, assign a PCPM Code of 18 for DND tone. Save this tone and return to the main menu by pressing <F10>.

STEP 16:   There might be some undefined filters in the tones detected. These filter values can be set by pressing <F3>. If any of the undefined values are too close to each other, then define only the lower value in the Filter Table. Ignore all warning messages about undefined value in filters.

STEP 17:   After defining all the filter values, verify the results by testing the tone table constructed by the Accucall Plus utility. Press <F2> to go to RUN mode. The RUN session will examine all the call progress tones, compare them to the tone table produced and present the appropriate PCPM code for the kind of tone detected. Make sure all the tones detected match with the PCPM codes presented.

STEP 18:   After testing the tone table, return to the main menu and save the tone table before exiting the Accucall Plus utility. To save the tone table press <F8>, type in a unique name for the table (for example; PANA616.TON or PREMIER.TON etc). Then press <F7> to save. After saving your tone table, you can exit the Accucall Plus utility by pressing <F10>.

Note: A warning message about undefined filters might occur when saving the tone file. This message can be ignored.

6. THE CONFIG FILE

Make sure that your Rhetorex CONFIG file is configured to operate on the appropriate tone file. To do this, add the following lines in the CONFIG File:

TONETABLE=XXXXXXXX.XXX
FILTERTABLE=XXXXXXXX.XXX

(XXXXXXXX.XXX refers to the name of the tone file produced by the Accucall Plus utility).