

MiVoice MX-ONE

Installing Hardware Overview - Installation Instruction

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Contents

Chapter: 1	Introduction	1
	Scope	1
	Target Group	1
	Prerequisites	1
	Training	1
	Electrical Connections	1
	Safety	2
	Site Planning	2
	Grounding and Earthing	2
Chapter: 2	Overview MiVoice MX-ONE Products	3
	Boards in MiVoice MX-ONE	3
	Mitel MX-ONE Chassis	4
	MX-ONE 1U chassis, Prod No. 87L00032BAA-A	4
	MX-ONE Lite, 3U chassis, Prod No. 87L00039BAA-A	4
	MX-ONE Classic, 7U chassis	5
	Fan Unit (for 7U Chassis)	6
	Servers	7
	AC/DC Power Units	7
	51305282, 2U Power Unit	7
	ABB (GE) 48V Power Unit (SPS - 48V Slimline Power Shelf)	8
	Battery String	8
	Cables	8
Chapter: 3	Environmental Requirements	9
Chapter: 4	Installation Preparation	10
	Unpacking	10
Chapter: 5	Earthing	11

Chapter: 6	Installing Chassis in a Cabinet	12
		1
Chapter: 7	Cabling	14
Chapter: 8	Connection of External Cables	15
Chapter: 9	Alarm Installation	16
Chapter: 10	Software Installation and Configuration	17
Chapter: 11	Installation Test	18
		1
		1
Chapter: 12	Concluding Routines	19

Introduction

MX-ONE is a communication solution for enterprises. MX-ONE integrates voice communication in fixed and mobile networks for public as well as private service. MX-ONE can be integrated into an existing Local Area Network (LAN) infrastructure. MX-ONE supports both IP telephony and functions found in classic circuit-switched PBXes (Private Branch Exchanges).

Scope

This document describes the MX-ONE installation procedure structure and shows the steps needed for a HW installation. For details of each area, see the following documents:

- *Installation preparation and Earthing*, 19/1531-ASP11301
- *Installation chassis in a Cabinet*, 20/1531-ASP11301
- *Installation boards and Cabling*, 21/1531-ASP11301

Target Group

The target group for this document is personnel involved in installing the MX-ONE.

Prerequisites

This section lists requirements that must be fulfilled before the installation starts.

Training

Personnel working with Mitel MX-ONE systems must have the training required to perform their tasks correctly.

It is recommended for engineers installing the MX-ONE to be acquainted with the following areas:

- MX-ONE Service Node
- Media Gateway in MX-ONE
- Certification
- TCP/IP Networks

Electrical Connections

Installation procedures involving connection of power cables, batteries and earthing, must be performed according to local regulations.

Safety

All personnel involved in installation must read and understand the safety instructions prior to installation, see the description document for *SAFETY*.

Site Planning

Read through each device installation documentation, and from there, conclude where the equipment shall be installed.

Special conditions are valid for the Nordic countries; Sweden, Norway and Finland, where the MiVoice MX-ONE must be installed in a Restricted Access Location (RAL).

For MX-ONE, an analogue trunk line generates a touch or leakage current which if there are several analogue trunk lines installed, it calls for the installation to be in a “*Restricted Access Location*”. The MX-ONE 3U and 7U chassis are marked with a warning text “*High voltage current...*” to reflect this.

Grounding and Earthing

In this document the expressions grounding and earthing have the same meaning.

Overview MiVoice MX-ONE Products

Boards in MiVoice MX-ONE

The following circuit boards can be used in the exchange. For technical data about the boards, see document 20/1531-ASP11301, *INSTALLATION CHASSIS and CABINET*.

Table 2.1: Boards (Sheet 1 of 2)

Board	Product number	Information
ALU2	ROF 137 5373/11	Alarm unit for external alarms
ASU Lite	ROF 137 6307/31	Mitel Server Unit, Lite. 8 GB
ASU-II	ROF 137 6307/4	Mitel Server Unit. 16 GB
ASU-III	ROF137 6307/5	Mitel Server Unit. 32 GB
DC/DC	ROF 137 6303/1	Power unit for 7U chassis
ELU26	ROF 137 5321/12	ISDN-S digital extensions
ELU31	ROF 137 5412/4	DECT extensions, Base stations
ELU33	ROF 137 5062/1	Digital extensions
ELU34	ROF 137 5064/x	Analog extensions with message waiting
FTU2	ROF 137 5415/11	Failure Transfer Unit
MFU	ROF 137 5348/x	Multi frequency unit
MGU2	ROF 137 6304/4	Media Gateway Unit, 4 E1/T1
TLU76	ROF 137 5338/x	Digital trunk, ISDN, E1, DPNSS, CAS, SS7
TLU77	ROF 137 5387/x	ISDN, T1, DPNSS, CAS depending on version
TLU79	ROF 137 5349/11	ISDN-T 2B+D trunk line
TLU80	ROF 137 5406/11	4-wire analog trunk using E&M signaling. NOTE: This board is used in MX-ONE Classic (7U), MX-ONE Lite (3U) and MX-ONE Slim (1U).

Table 2.1: Boards (Continued) (Sheet 2 of 2)

Board	Product number	Information
TLU83	ROF 137 6305/1	Analog trunk line (loop start, ground start, call metering. CLI with FSK and DTMF)
TMU	ROF 137 5335/x	Tone and Multi part Unit. DTMF

NOTE: When ASU is stated, it means both versions of ASUs are applicable, that is, ASU Lite, ASU-II, and ASU-III.

Mitel MX-ONE Chassis

MX-ONE 1U chassis, Prod No. 87L00032BAA-A

The MX-ONE 1U (prod. No. 87L00032BAA-A) is a 1U high chassis with space for 1pcs of 40mm board or 2 pcs of 20mm boards mounted horizontally. It has 3 cooling fans (on the left hand side).

Figure 2.1: The MX-ONE 1U chassis equipped with MGU2 and ELU34



The 1U chassis can be fed with both -48VDC and 115/230VAC. All inlets are on rear side.

The 1U chassis can have input voltage in the range - 42VDC to - 56VDC.

The mounting brackets can be rotated to support either metric or 19-inch rack systems.

NOTE: There is no -5V provided in the backplane which means that e.g. TLU80 can be used in MX-ONE 1U chassis.

NOTE: The maximum power supply is 125 W. For power calculations see document *POWER CONSUMPTION*.

MX-ONE Lite, 3U chassis, Prod No. 87L00039BAA-A

This MX-ONE Lite is a chassis with boards mounted horizontally, and 2pcs of cooling fans (on the left hand side). The chassis can be equipped with up to 6pcs of 20mm boards.

MX-ONE Lite has board positions/Time slots 00, MGU/10, 20, 30, 40 and 50 counted from lowest position.

See MX-ONE Lite, 87L00039BAA-A, equipped with MGU2, ASU and 3 additional boards.

The chassis have the Fans in a unit that is easily switched if needed.

NOTE:

- Slot MGU/10 can only be used for MGU boards.
- The unit has replaceable fuses on the -48 V power supply voltages One (1) on the -48 V input and one (1) from the internal AC/DC power supply.
- There is no -5V provided in the backplane which means that e.g. TLU80 can be used in MX-ONE Lite.

If a 40mm building height server board (ASU) is installed, together with MGU2 with its 20mm front, three slots are left for an arbitrary MX-ONE board, for example an ELU33, ELU34 and TMU/12. See Figure 2:MX-ONE Lite, 87L00039BAA-A, equipped with MGU2, ASU and 3 additional boards.

The 3U chassis can have input voltage in the range - 46VDC to - 56VDC.

NOTE: The maximum power supply is 250 W. For power calculations see document *POWER CONSUMPTION*.

Figure 2.2: MX-ONE Lite, 87L00039BAA-A, equipped with MGU2, ASU and 3 additional boards

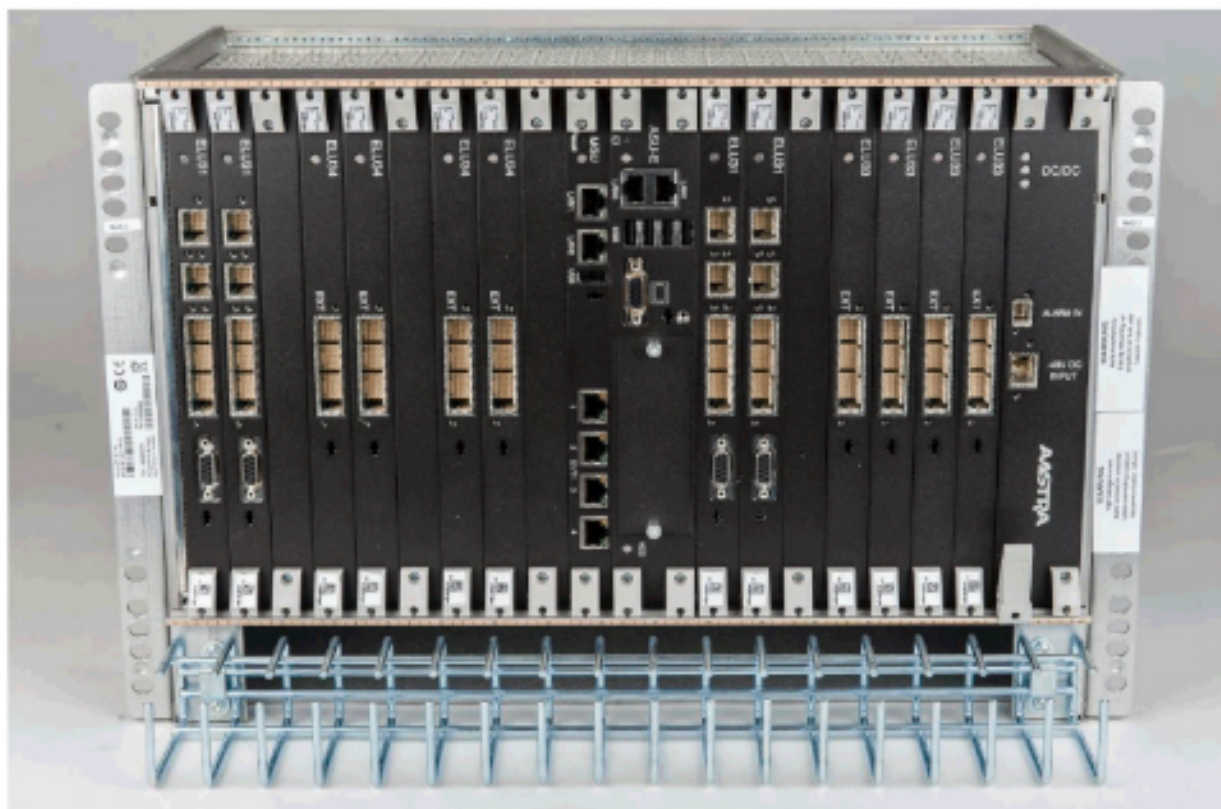


MX-ONE Classic, 7U chassis

In the MX-ONE Classic (prod. No. BFD76140/x) the boards are mounted vertically in this 19 inch wide chassis. This chassis need additional Fan Unit. See *Fan Unit (for 7U chassis)* on page 8 . The chassis can only be feed by -48V in the front of the DC/DC-board.

The MGU board goes in the middle at a dedicated position. It is recommended to place the ASU on the right side of the MGU.

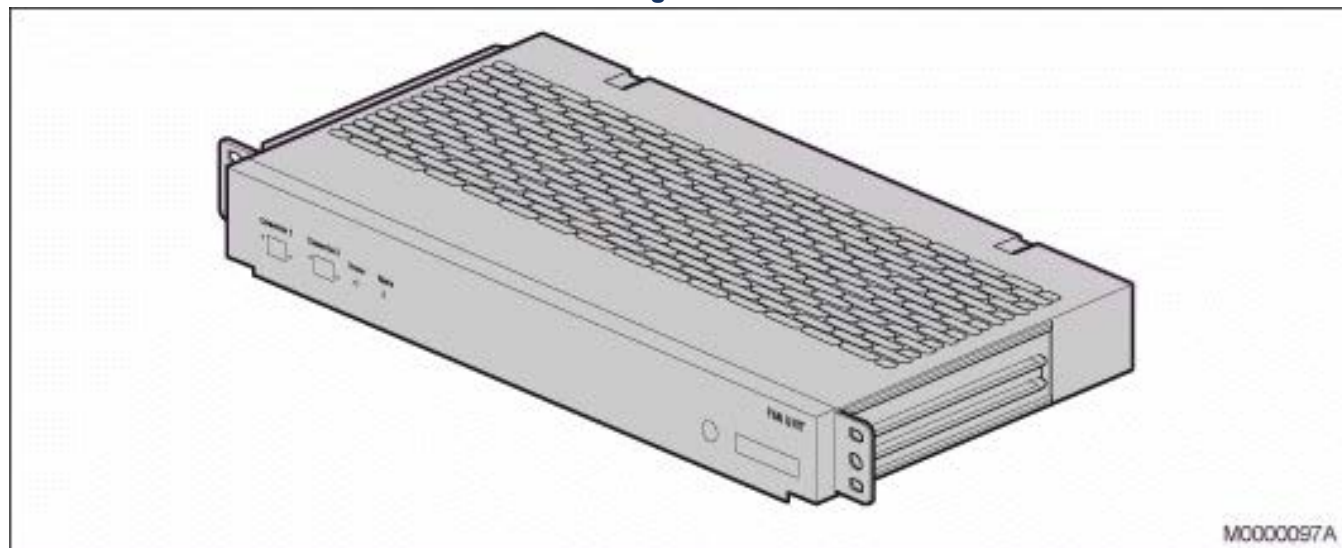
The MX-ONE Classic has time slots marked on the top label. The marking is 00, 10,..., 70 starting from board position 01 and from board position 45. These positions are intended for the device boards.

Figure 2.3: MGU2 and ASU in the 7U high, 19 inch chassis

NOTE: To fulfill the demands on Fire Enclosure for the 7U chassis, the Air plate SXA1122330/1 included in NTM144262 have to be mounted. See document 20/1531-ASP11301, *Installing Chassis in a Cabinet*.

Fan Unit (for 7U Chassis)

The fan unit provides forced cooling of the MX-ONE Classic media gateway boards in the 7U chassis. One fan can be used to serve two 7U- chassis on top of each others.

Figure 2.4: Fan Unit

Servers

There are several types of servers used in the MX-ONE. The ASU Servers in two versions and the Standard Servers.

For technical data about the servers, see document *INSTALLATION CHASSIS IN A RACK*.

Figure 2.5: ASU in a MX-ONE 1U chassis



The ASU Server consists of an Server board (ASU) slid into the MX-ONE 1U chassis.

AC/DC Power Units

The AC/DC power units converts the power from the AC power supply network (mains) to DC output for the batteries and for the 1U, 3U and 7U chassis.

For installation of these Power Units it is important to follow the suppliers Installation Instructions/Manuals.

51305282, 2U Power Unit

The Aspiro 2U height Power Unit is delivered with one 800W rectifier module with a spare slot for one extra rectifier to support a total of 1600W. Optional Controller (PCC) and cables for battery, battery supervision and Alarm handling are available.

NOTE: The PCC is needed to control batteries.

Figure 2.6: 2U height AC/DC Power Unit, 800-1600W



NOTE: The AC/DC above is equipped with 2x800W rectifier and the PCC-unit.

ABB (GE) 48V Power Unit (SPS - 48V Slimline Power Shelf)

A new 48 Volt power supply unit introduced as an alternative to the present UniPower (2U) system. The new unit is from ABB (former GE) and is called SPS-48V Slimline Power Rack. This comes with SNMP support.

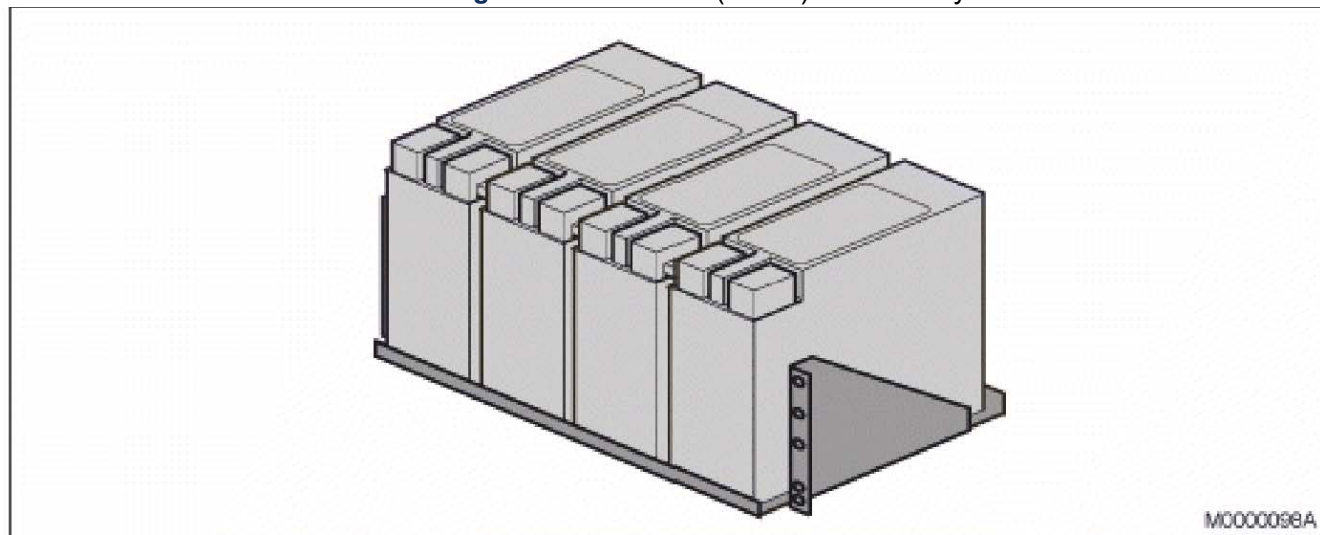
Figure 2.7: 2U height AC/DC Power Unit, 800-1600W



Battery String

The batteries provide backup power to the system. Two types of batteries are available, 31 Ah and 62 Ah.

Figure 2.8: Batteries (62 Ah) and Battery Shelf



For technical data about the batteries, see document *INSTALLATION CHASSIS IN A RACK* .

Cables

Cables for each board, power and batteries see document 21/1531-ASP11301/*INSTALLATION BOARDS AND CABLING*.

Environmental Requirements

Read through each device installation documentation, and from there, conclude that all of the equipment can be installed.

NOTE: Values below are relevant for MX-ONE products. For other products see suppliers Technical Specification.

The exchange room must meet the following requirements:

- The air shall not contain any dust, smoke, gases or acid fumes
- Temperature +5 to +40 °C (+41 to +104 ° F)
- Relative air humidity 20-80%
- The relationship between temperature and air humidity shall not cause condensation
- The equipment must not be exposed to direct sunlight
- Ensure that the floor withstands the mass of the PBX
- For concrete floor, the distributed load is the total mass of equipment in the room divided by the area of the room
- For wooden floor, extra caution must be taken concerning the spot load of the cabinets
- The floor should be covered by an earthed anti-static carpet in order to reduce the risk of the exchange being exposed to interference caused by static electricity

If the batteries are to be installed in the exchange room, they must be of a type which does not produce gases or acid fumes.

If the batteries are to be installed in a room outside the exchange room, the environmental conditions must comply with the battery suppliers instructions.

The PBX operators room should be of standard office design, but the floor as in the exchange room should be covered by an anti-static carpet.

Installation Preparation

The site is prepared mostly during the site planning stage, as described in the environmental spec for *MX-ONE SITE PLANNING*. Should these preparations not be complete, perform the following steps before starting the installation:

1. Mark where to position the equipment and where to mount wall supports (if required).
2. Drill holes for anchoring the rack to the floor (use the rack and the tip protection as a template).
3. If necessary, make holes for the running of cables between rooms.
4. If required, set up cable chutes in the site.
5. Clean the room before unpacking the equipment.
6. Check that needed tools are available. For more details, see installation instructions for *Installation preparation and Earthing*.
7. Check that ESD-straps are available. For more details, see installation instructions for *Installation preparation and Earthing*.

Unpacking

Check that you have received all part and products according to the delivery slip.

Be careful when open the packing, so no parts are damaged by sharp tools.

Secure that no parts remains in the packing

Recycle the packing material according to local recommendations.

For more details about Installation Preparation, see installation instructions for *Installation preparation and Earthing*.

Earthing

It is vital that all MX-ONE hardware building blocks are properly connected to a common earth.

Ensure that the different units, the MX-ONE Service Node, the Standard Server, the MX-ONE Lite, the MX-ONE Classic, the AC/DC unit and the fan unit, are connected to the common earth when these units are screwed into a 19" rack.

Also ensure that MX-ONE equipment that is located outside of the racks, like, for example, voice recording equipment, are properly connected to the common earth.

At both ends of the grounding conductor the units shall be free from paint or other insulating material.

NOTE: The earth resistance shall not exceed 10 milli ohms.

For more details about Earthing, see installation instructions for *INSTALLATION PREPARATION AND EARTHING*.

Installing Chassis in a Cabinet

These chapters describes the installation of hardware components in the BYB 501 cabinet. The recommended installation order is from the bottom of the cabinet to the top.

For details see doc 20/1531-ASP11301 *Installing Chassis in a Cabinet*

Depending on the configuration, some pieces of hardware can be pre-installed. Therefore, some installation steps may be irrelevant. In that case, ignore the irrelevant step and proceed to the next one.

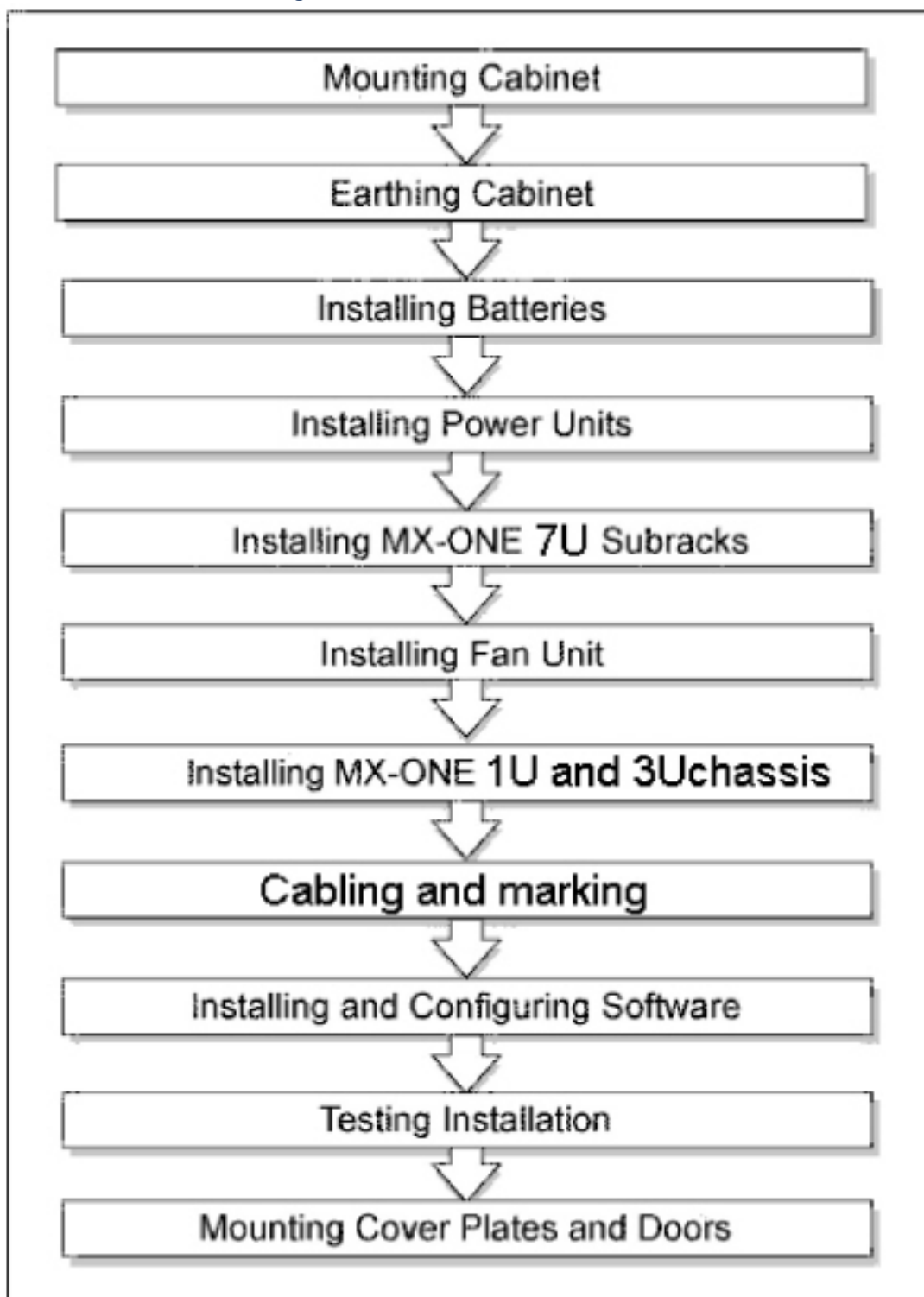
It is recommended to install the hardware at the cabinet locations described in the instructions. Although not recommended, it is possible to change the hardware placement in the cabinet. In that case, the following constraints must be regarded:

- The batteries must be placed at the lowest position in the cabinet.
- The fan unit must always be installed directly above the 7U sub-racks.
- If two 7U sub-racks are mounted, they must be mounted closely, one above the other, and with a fan unit on top.

NOTE: The instructions describe a hardware installation in the BYB 501 cabinet. When installing the hardware in other type of cabinets, refer to manufacturer instructions.

Overview

The following flow diagram shows the installation procedure step-by-step.

Figure 6.1: Work-flow for the MX-ONE Installation

Cabling

Cabling involves both internal and external connections on site.

External cabling is the routing of cables for grounding, to power equipment and other external devices.

Internal cabling is the routing of cables within a cabinet or between cabinets.

For details about cables, cable connection and marking see document 21/1531-ASP11301, *INSTALLATION BOARDS AND CABLING*, chapter 3.

Use the fastener straps (cable tie) provided in material set 25/BYB 501/1 to fasten the cables to the rack, cable chutes, rear sides of chassis and so on.

Connection of External Cables

Cabling to the MDF uses prefabricated cables.

Twisted, shielded, pair-cables are to be used for cabling between the PBX and MDF or between two PBXes (Media Gateway - Media Gateway).

For information about cables see document 21/1531-ASP11301, *INSTALLATION BOARDS AND CABLING*.

Alarm Installation

General alarms can be monitored in several ways depending on how the system is configured. In systems with MX-ONE Classic (7U chassis) and MGU board, the simplest way is to use the alarm input on the DC/DC-board and configure the MGU board.

When many external alarm shall be monitored or when system is not equipped with MGU board, an ALU2 board can be used.

If more in- or out- signals are required, the number of ALU2 boards can be increased. Alarm indications are normally transferred to the PBX operator consoles when using ALU2.

In systems with MGU boards, the system can supervise several alarms, both external and internal.

For details about alarm and the installation, see document *INSTALLATION BOARDS AND CABLING*.

Software Installation and Configuration

For software installation and configuration of MX-ONE, see the installation instructions for *INSTALLING AND CONFIGURING MIVOICE MX-ONE*.

For software installation and configuration of MX-ONE Messaging, see the installation instructions for *Fax Mail* and *Voice Mail*.

Installation Test

This section describes installation test at the end of the installation procedure.

Basic Installation Test

This section specifies basic check for correct installation of hardware components, mechanics, and cables.

1. Ensure that all internal, external, power and network cables are correctly connected.
2. Ensure that all cable connector screws are firmly tightened.

Installation Test for MiVoice MX-ONE

To check functionality for the MX-ONE telephones (if available) proceed as follows:

1. Make calls from an IP telephone to another IP telephone, to an analog telephone, to a cordless DECT phone, to a digital telephone and to a external number.
2. Make calls from an IP telephone to another IP telephone, to an analog telephone, to a cordless DECT phone, to a digital telephone and to a external number.
3. Make calls from a Digital telephone to another Digital telephone, to an analog telephone, to a DECT phone, to a IP telephone and to a external number.
4. Make a call from an external number to a Digital telephone.
5. Make calls from an analog telephone to another analog telephone, to a IP telephone, to a DECT phone, to a digital telephone and to a external number.
6. Make a call from an external number to a analog telephone.
7. Make calls from a DECT telephone to another DECT telephone, to an analog telephone, to a IP phone, to a digital telephone and to a external number.
8. Make a call from an external number to a DECT telephone.
9. Make calls to and from an Operators terminal to above different terminals (if available) and to and from an external number.

Concluding Routines

Before leaving the installation site, complete the following steps:

1. Clean up the site and remove objects like wrapping paper and cable pieces.
2. Dispose of waste material according to local regulations.
3. Print one copy of the safety document, and place it visible on site, see the description for *SAFETY*.
4. Place the battery service instruction sheet (included in NTM 144 265 see Mounting set for Battery) visible on site.
5. Ensure that the warning label (SVB 131 75) is fastened visible and close to the AC/DC unit.
6. Ensure that all cables to and from the chassis have earth connections mounted and that no cable shields are damaged.
7. Ensure that no internal cables are going outside the containment.

