

Remote Extension

INSTALLATION INSTRUCTION



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INTRODUCTION

The remote extension feature makes it possible to have public terminals as extensions in the MX-ONE Service Node. This installation instruction covers both public TDM trunk and public SIP trunk implementations.

This document contains installation instructions for the boards required for the mobile remote extension feature for MX-ONE Classic LIM systems. For Media Gateway LIMs, no hardware needs to be installed.

For a detailed description of the remote extension feature, see the description for *REMOTE EXTENSION*.

1.1

TARGET GROUPS

This document is intended for personnel installing boards in the MX-ONE Service Node.

1.2

GLOSSARY

For a complete list of abbreviations and glossary, see the description for *ACRONYMS, ABBREVIATIONS AND GLOSSARY*.

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GENERAL

It is necessary to have a connection to the PSTN or PLMN from the PBX. The signaling schemes that are supported are the following:

- ISDN/QSIG using a TLU76/11 or TLU77/1 board or MGU. Note that MGU2-X do not provide any ISDN interfaces.
- H.323 (trunk) using a IPLU board or an MGU
- DASS/DPNSS using a TLU 76/12 or TLU 77/2 board
- DT/DTMF/R2-MFC using a TLU 76/13 or TLU77/3 board
- SS7 using a TLU 76/14 board
- SIP (trunk) using an MGU or IPLU board

The ISDN/QSIG or H.323 scenario is shown below, see 1 ISDN or H.323 Scenario on page 4.

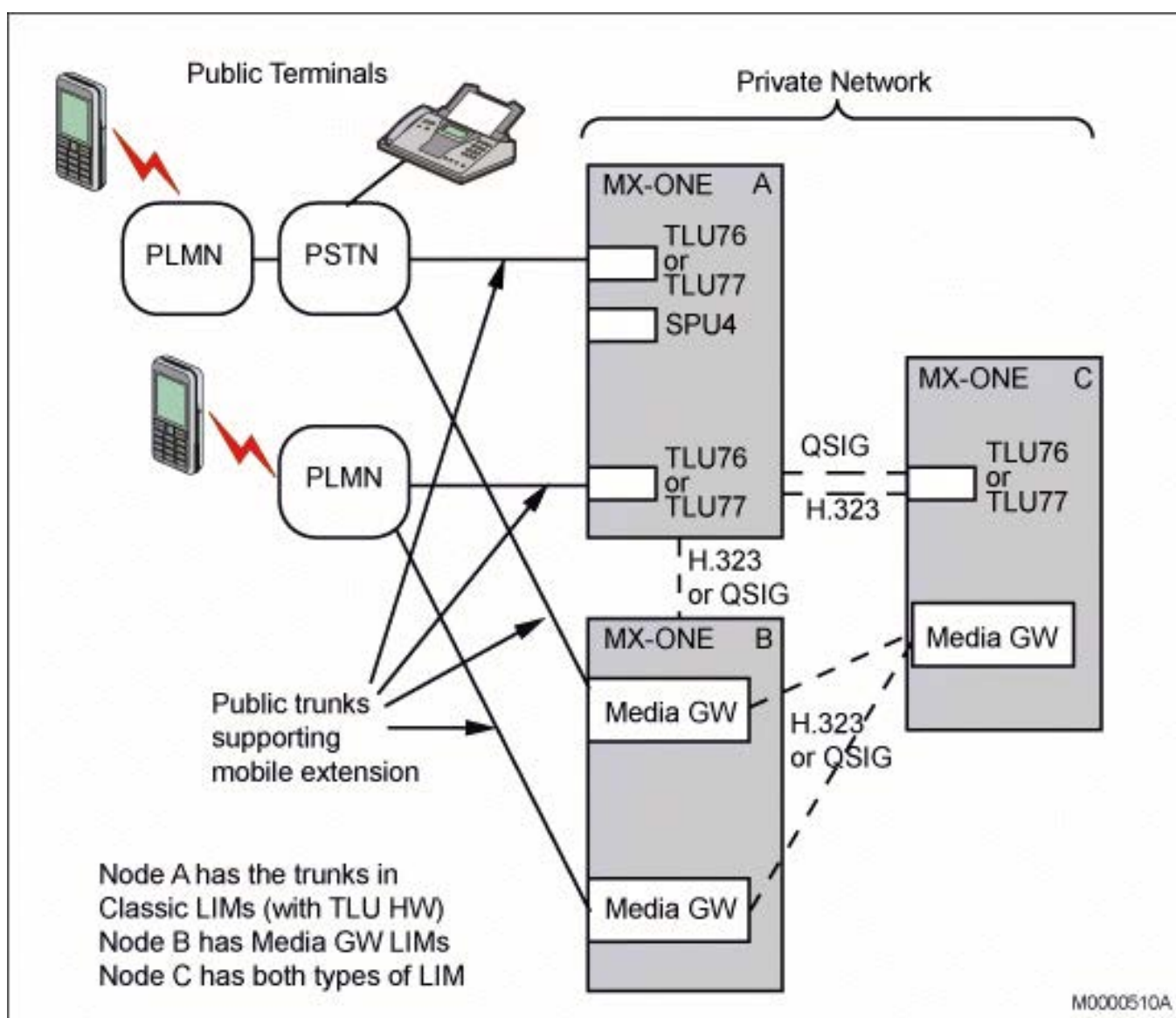


Figure 1: ISDN or H.323 Scenario

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TOOLS

An earthing wrist strap is needed for installation.

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PREREQUISITES

Verify with the command `license_status` that the MX-ONE system has a valid license for remote extensions. The status printout should be `MOBILE-EXTENSION`, which is the license that is valid for all remote extensions (mobile or fix).

If a license is missing or needs to be upgraded, contact the purchase office where the MX-ONE system was bought. When a new license file is received, see operational directions for *ADMINISTRATOR USER'S GUIDE* section LICENSE HANDLING.

Prepare exchange data for the remote extension in accordance with the operational directions for *REMOTE EXTENSION, RE*.

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DIMENSIONING

The following table shows the recommended number of SPU4 boards per trunk ports per remote extension initiated in the system for a 1% grade of service, with several values of traffic call rate from remote extensions.

Table 1 Dimensioning Table

No. of SPU4 boards per TLU76 trunk ports	No. of SPU4 boards per TLU77 trunk ports	Traffic call rate for remote extension (Erlang)				
		0.25	0.2 *	0.15	0.1	0.05
1 / 30	1 / 23	80	100	130	200	400
2 / 60	2 / 46	190	240	310	480	900
3 / 90	3 / 69	300	380	500	750	1000
4 / 120	4 / 92	410	520	690	1030	2060
5 / 150	5 / 115	530	660	880	1320	2630
6 / 180	6 / 138	650	810	1070	1610	3210
7 / 210	7 / 161	760	950	1270	1900	3790
8 / 240	8 / 184	880	1100	1460	2190	4380
9 / 270	9 / 207	1000	1240	1660	2480	4960
10 / 300	10 / 230	1110	1390	1850	2780	5550
11 / 330	11 / 253	1230	1540	2050	3070	6140
12 / 360	12 / 276	1350	1690	2250	3370	6720
13 / 390	13 / 299	1470	1830	2440	3660	7320
14 / 420	14 / 322	1590	1980	2640	3960	7910
15 / 450	15 / 345	1710	2130	2840	4250	8500
16 / 480	16 / 368	1820	2280	3030	4550	9090
17 / 510	17 / 391	1940	2430	3230	4850	9680
18 / 540	18 / 414	2060	2580	3430	5140	10280
19 / 570	19 / 437	2180	2720	3630	5440	10870

No. of SPU4 boards per TLU76 trunk ports	No. of SPU4 boards per TLU77 trunk ports	Traffic call rate for remote extension (Erlang)				
		2300	2870	3830	5740	11470
20 / 600	20 / 460	2300	2870	3830	5740	11470
21 / 630	21 / 483	2420	3020	4030	6040	12060
22 / 660	22 / 506	2540	3170	4220	6330	12660
23 / 690	23 / 529	2660	3320	4420	6630	13260
24 / 720	24 / 552	2780	3470	4620	6930	13850
25 / 750	25 / 575	2900	3620	4820	7230	14450
Each 1/30 more	Each 1/23 more	+120	+150	+200	+300	+600

Note: *) For typical dimensioning the 0.2 Erlang value is used.

Example 1:

For 200 Remote Extensions with 0.2 Erlang traffic, the nearest value in the table is 240. This gives two SPU4 boards and two TLU76 boards (30+30=60 trunk lines) or two TLU77 boards (23+23=46 trunk lines).

Example 2:

For 5,000 Remote Extensions with 0.25 Erlang traffic, 25 SPU4 boards and 750 trunk lines should be needed for the first 2,900 Remote Extensions (according to the previous dimensioning table). For the remaining 2,100 remote extensions, 19 SPU4 boards are needed.

In total, 25+19=44 SPU4 and TLU76 or TLU77 (with 1530 or 1173 trunk lines) are needed for 5000 remote extensions.

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SPACE REQUIREMENTS

The remote extension feature requires an increased number of DTMF-tone receivers, since it has the possibility to activate features like Inquiry, Alternation and Conference. To be able to detect the DTMF tones, a key code receiver has to be connected during speech state to receive orders from the remote extension (both mobile and fix).

If MGU is used, no SPU4s are needed, but additional SPU4s can be used, for example for capacity reasons, and will then be selected before the MGU key code receiver resources.

The hardware for DTMF-tone receivers in MX-ONE Classic is one or more SPU4 boards. Each board uses a board position and occupies 32 time slots. The boards should be placed in the slots ending with zero (for example 00,10,20,...) and are located under the ESD-protection cover.

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MOUNTING

7.1

MOUNTING THE SPU4

The SPU4 boards are to be placed in free device board positions under the ESD cover. An SPU4 board supplies 32 key code receivers and a maximum of 32 SPU4 boards can be installed in a LIM.

While carrying out service on the system it is recommended that Electrostatic Discharge (ESD) wristbands are used. For more information about using ESD wristbands, see installation instructions for *INSTALLING MX-ONE*.

For additional information about safety, see the description for *SAFETY*.

Note: At least one SPU4-board is needed in each MX-ONE Classic (in a multi gateway scenario), that has an incoming trunk. If MGU is used, no SPU4s are needed.

The following is required:

- SPU4 boards must be placed in all MX-ONE Classic, where trunk lines are installed.
- The HLR for a remote extension should be initiated in the LIM where trunk lines are installed in order to avoid extra inter-LIM signaling.

For information about how to install boards in the magazine, see installation instructions for *INSTALLING MX-ONE*.

7.2

POWER EQUIPMENT

No external power supply is needed for the SPU4 boards.

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POST INSTALLATION MEASURES

Any doors or other mechanical parts that have been removed should be replaced in their original positions.

SPU4 has several on-board LEDs, both for normal operation (four LEDs placed close to the board front) and debugging purposes (placed internally on the board), 2 SPU4 LEDs when the Board is in Normal Operation on page 9.

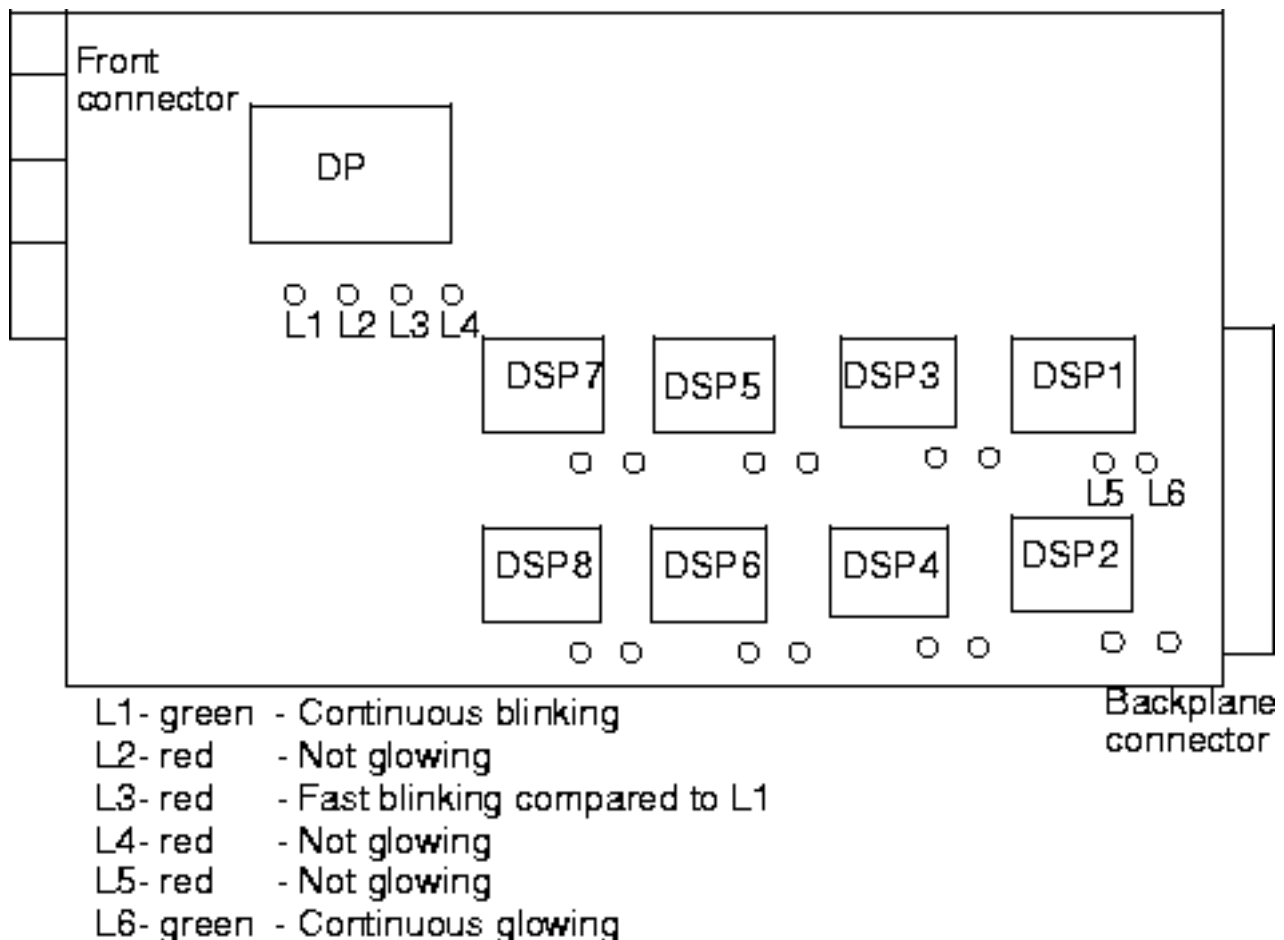


Figure 2: SPU4 LEDs when the Board is in Normal Operation

LEDs can be checked to see if the board is in normal operation (see the above figure):

- The four LEDs placed close to the front of the board shows the status of the Ethernet interface. (the DTMF32 application does not use this interface).
- The internal LEDs (L5 and L6) glow intermittently as an indication that the device processors and Digital Signal Processors (DSPs) are working properly.