



Avaya Solution & Interoperability Test Lab

Application Notes for Configuring Intermedia XMU+ with Avaya Communication Server 1000E R7.5 using a T1 Line Side Connection – Issue 1.0

Abstract

These Application Notes describe the configuration steps for provisioning Intermedia's XMU+ system to successfully interoperate with Avaya Communication Server 1000E R7.5 using a T1 line side connection. Intermedia's XMU+ is a voice application platform that supports Recorded Announcements, Music on Hold and basic IVR technology.

Information in these Application Notes has been obtained through DevConnect Compliance Testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe the compliance tested configuration using Intermedia's XMU+ solution with Avaya Communication Server 1000E (CS1000E) R7.5 using a T1 Line Side Card on the Avaya Communication Server 1000E. Included with every Intermedia's XMU+ is the XMUCOM+ administration software, a windows-based configuration and communication software that helps administrators directly manage Intermedia's XMU+ systems onsite. The software has a GUI interface, editor browser and pull-down menus with tools administrators need to schedule messages, simultaneously download configuration files/messages to multiple Intermedia's XMU+ systems, and review statistics.

Typical Intermedia's XMU+ applications include.

- ACD/UCD announcements
- Auto attendant
- Information Lines
- Music on hold (MOH)

The Intermedia system used for the test consists of an Intermedia XMU+ server connected to the Avaya Communication Server 1000E R7.5.

2. General Test Approach and Test Results

2.1. Interoperability Compliance Testing

The interoperability compliance test included both feature and functionality testing. The feature and functionality testing focused on verifying that the voice application response is activated on the XMU+ in various scenarios. The testing includes:

- Verification of connectivity between the CS1000E and XMU+
- Verification that basic Recorded Announcements (RAN) in various telephony operations using RAN announcement applications on the XMU+
- Verification that interactive voice response occurs in various telephony operations using Information Lines application on the XMU+

The compliance testing focused on testing a T1 connection to the CS1000E. The testing was performed using a series of group hunt lists associated with various XMU+ unique applications.

Note: The CS1000E was configured for μ Companding Law

2.2. Test Results

The test approach was to validate the correct operation of typical interactive voice response applications such as ACD Announcements, etc. The following results were obtained:

- Confirmation that interactive voice messages are played as expected in different call scenarios
- Confirmation that messages are routed successfully as expected
- Confirmation of good quality audio in all test cases

The tests were all functional in nature and performance testing was not included. All the test cases passed successfully.

2.3. Support

Technical support for Avaya products can be obtained from <http://support.avaya.com>. Technical support for the XMU+ can be obtained as follows;

- Email: support@interalia.com
- Website: www.interalia.com
- Phone: +1 800 531 0115 (Toll Free)

3. Reference Configuration

Figure 1 shows the network topology during compliance testing. The Communication Server 1000E running R7.5 software on a CPPM card was used as the hosting PBX. Session Manager R6.1 was used to register SIP phones and the System Manager R6.1 was used to configure the System Manager. The XMU+ is connected to the hosting PBX using a T1 connection. The XMU+ has a T1 card installed in the rear of the chassis which is connected to the T1 Line Side card on the Communication Server 1000E. XMUCOM+ is management software installed on a client PC. For compliance testing the XMUCOM+ was installed on a Windows XP operating system.

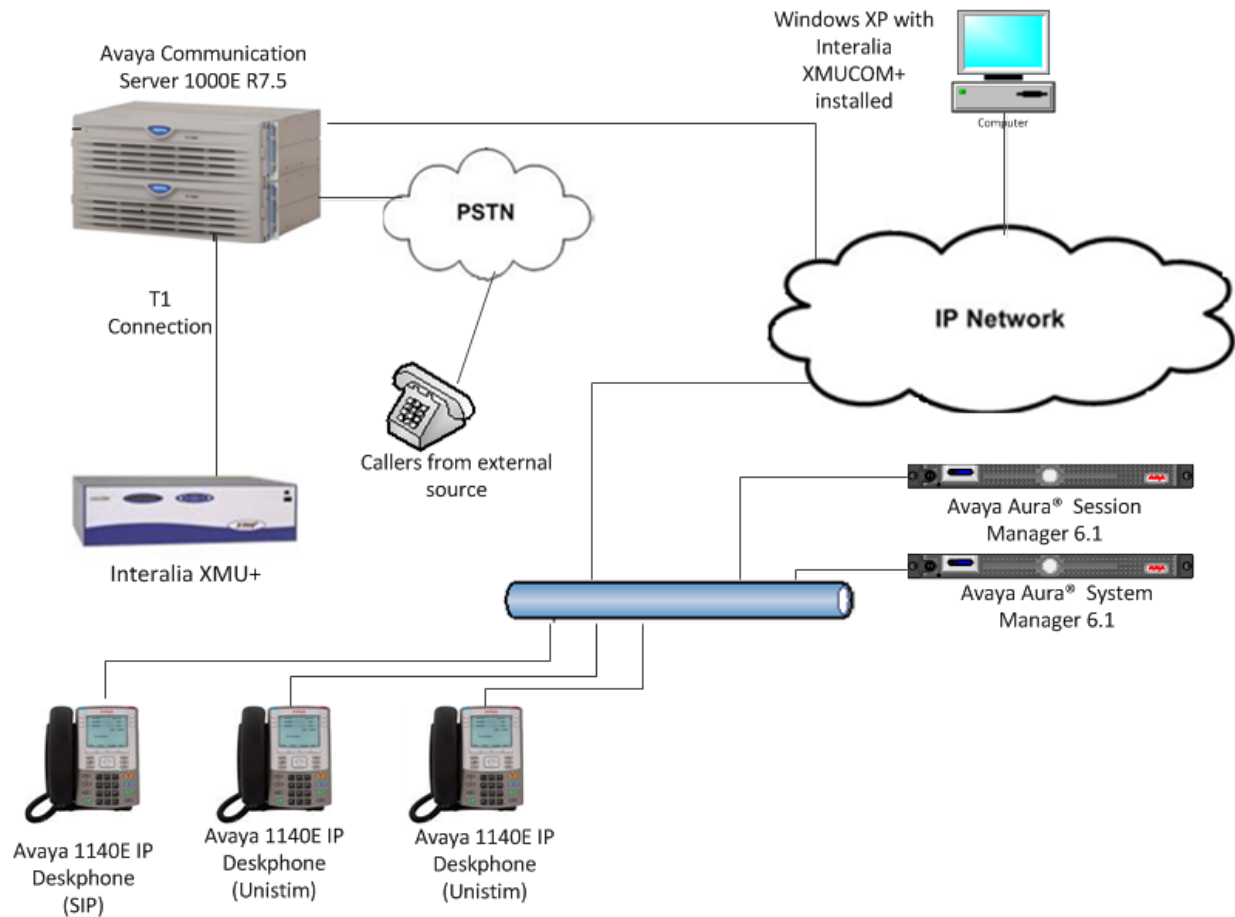


Figure 1: Network Topology and Connectivity for Intermedia XMU+ and Avaya CS1000E

4. Equipment and Software Validated

All the hardware and associated software used in the compliance testing is listed below.

Equipment	Software/Firmware
Avaya PBX Products	
Avaya Communication Server 1000E CPPM	Avaya Communication Server 1000E R7.5 SP1
Line Side T1 interface	NT5D11
Avaya S8800 Media Server	Avaya Aura [®] System Manager R6.1 Build 6.1.0023
Avaya S8800 Media Server	Avaya Aura [®] Session Manager R6.1 Build 6.1.0012
Avaya 1140E IP Deskphone	UNISTim 4.3 SIP V04.00
Interalia's Equipment	
Interalia XMU+	Firmware Version: 6.85 XMUCOM 7.25 on Windows XP
Interalia T1 Card	47367

5. Configure Avaya Communication Server 1000E

Configuration and verification operations on the CS1000E illustrated in this section were all performed using terminal access over a serial link to a TTY port on the CS1000E using Telnet. The information provided in this section describes the configuration of the CS1000E for this solution. For all other provisioning information such as initial installation and configuration, please refer to the product documentation in **Section 9**.

Note: The configuration of the PRI interface to the PSTN is outside the scope of these Application Notes.

5.1. T1 Connection between Interalia XMU+ and Avaya Communication Server 1000E

Before placing the T1 Line side card in a free slot in the CS100E Chassis some dip switch setting need to be set. On the CS1000E T1 card there are 2 switches with 8 settings on each. The XMU+ T1 card has 1 switch with 8 settings. Following is settings on both the CS1000E T1 card and the XMU T1 card.

CS1000E S1 →	off,off,off,off,off,off,off,off
CS1000E S2 →	off,off,on,off,off,on,off,on
XMU+ →	off,on,on,off,off,on,on,on

5.2. Creating Extensions for the T1

A number of analog extensions are created to connect to the IVR Auto Attendant channels on the XMU+. The number of Analog extensions on the CS1000E to create depends on the number of channels that are configured for IVR Auto Attendant on the XMU. In order to create a new analog extension **overlay 20** on the CS1000E is used. Use the **NEW** command in **LD 20** to create new analog extensions. The set type will be **500**. The Class of service (**CLS**) must allow transfer (**XFA**). Subsets of these commands are illustrated below.

Note: In the Telnet screenshots below only the unique prompt inputs are shown. Carriage Return all other prompts to set default values.

LD 20

Prompt	Response	Description
>	LD 20	Enter Overlay 20
REQ	NEW	Create New
TYPE	500	Analog set
CUST	0	Customer Number as defined in LD15
TNB	4 0 7 0	Loop Shelf Card Unit
DN	3220	Extension Number
CLS	XFA	Transfer Allowed

5.3. Creating a Group Hunt List Pilot DN

If there are a number of channels on the XMU associated with the same service, then these channels can be added to a group hunt on the CS1000E in order to access using a single route point or Pilot DN. For compliance testing four ports were used for IVR front line services and these corresponding extensions were placed into a Group Hunt List. To create a pilot DN overlay 57 is used on the CS1000E. Use the **CHG** command in **LD 57**. Subsets of these commands are listed below.

LD 57

Prompt	Response	Description
>	LD 57	Enter Overlay 57
REQ	CHG	Change existing
TYPE	FFC	Flexible Feature Codes Data Block
CODE	PLDN	Pilot DN (Group hunt access DN)
USE	GPHT	Use is Group Hunt
LSNO	x	Use the list number created section 5.4
HTYP	LIN/RRB	Linear or Round Robin

5.4. Adding the Analog Extensions into the Group Hunt

To create a group hunt list, overlay 18 is used. Use the **NEW** command in **LD 18** to create a new group hunt list. Subsets of these commands are listed below.

LD 18

Prompt	Response	Description
>	LD 18	Enter Overlay 18
REQ	NEW	Create new
TYPE	GHT	Group Hunt
LSNO	1	Group Hunt List Number
CUST	0	Customer Number as defined in LD15
SIZE	1-96	Amount of entries in the GHT
STOR number	0 3220	0 is the entry number and 3220 is the Ext

5.5. Creating a Pilot DN

Create a pilot DN which is the number associated with the hunt group. Use the **NEW** command in **LD 57**.

Note: The List Number (**LSNO**) used is the one created in **Section 5.4**.

LD 57

Prompt	Response	Description
>	LD 57	Enter Overlay 57
REQ	NEW	
TYPE	FFC	Flexible Feature Codes Data Block
CODE	2200	Pilot DN (Group hunt access DN)
USE	GPHT	Use is Group Hunt
LSNO	1	Use the list number created in section 5.4
HTYP	LIN/RRB	Linear or Round Robin

6. Configure the Intermedia XMU+

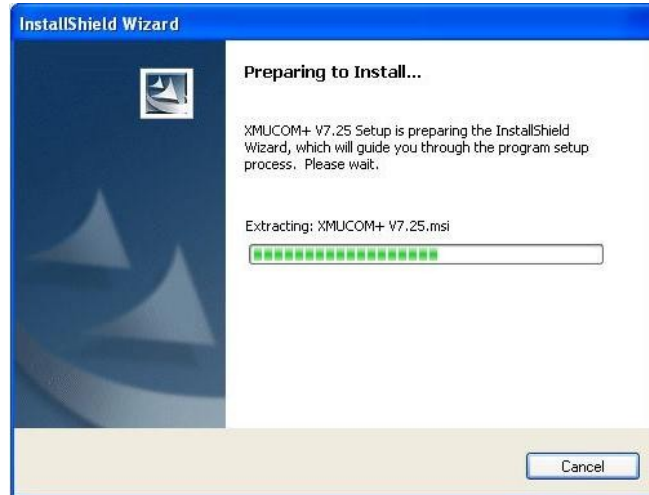
The following section documents the necessary steps taken to configure the XMU+.

6.1.1. Installing Intermedia XMU+

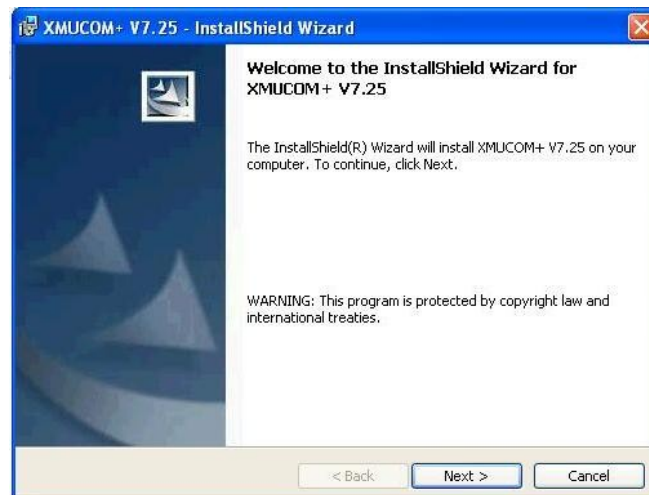
The installation of the XMU+ is from a CD containing the software. After placing the CD into a PC it automatically starts to the following screen. Click on **Install XMUCOM+ (XMU+/SBX)** highlighted.



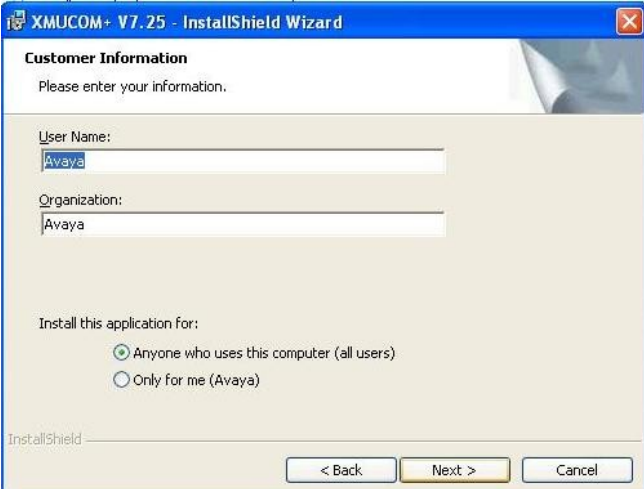
A **Preparing to Install** screen appears below.



A welcome screen appears. Click **Next** to continue with the install.

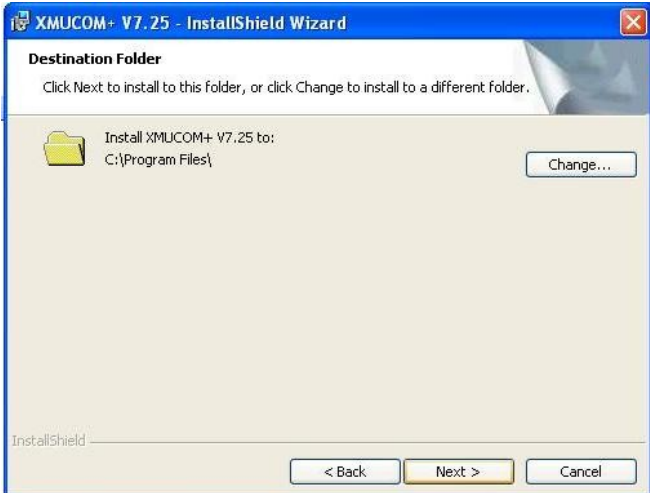


On the **Customer Information** screen, enter **User Name** and **Organization** and click the **Next** button.



The screenshot shows the 'Customer Information' screen of the XMUCOM+ V7.25 - InstallShield Wizard. The window title is 'XMUCOM+ V7.25 - InstallShield Wizard'. The main heading is 'Customer Information' with the instruction 'Please enter your information.' Below this, there are two text input fields: 'User Name:' with 'Avaya' entered, and 'Organization:' with 'Avaya' entered. Underneath, there is a section 'Install this application for:' with two radio button options: 'Anyone who uses this computer (all users)' (which is selected) and 'Only for me (Avaya)'. At the bottom left, it says 'InstallShield'. At the bottom right, there are three buttons: '< Back', 'Next >', and 'Cancel'.

Choose the default destination on the **Destination Folder** screen and the **Next** button.



The screenshot shows the 'Destination Folder' screen of the XMUCOM+ V7.25 - InstallShield Wizard. The window title is 'XMUCOM+ V7.25 - InstallShield Wizard'. The main heading is 'Destination Folder' with the instruction 'Click Next to install to this folder, or click Change to install to a different folder.' Below this, there is a folder icon and the text 'Install XMUCOM+ V7.25 to: C:\Program Files\'. To the right of this text is a 'Change...' button. At the bottom left, it says 'InstallShield'. At the bottom right, there are three buttons: '< Back', 'Next >', and 'Cancel'.

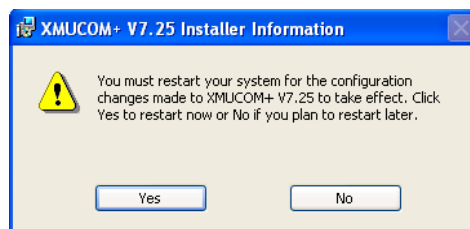
Review the selected settings and click **Install**.



A screen appears to indicate the successful install of the product. Click **Finish** to complete it.

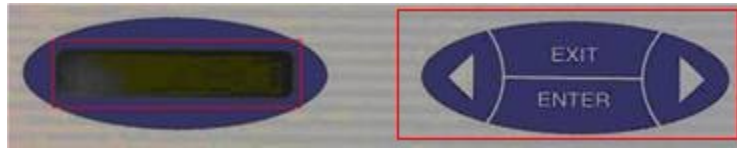


Restart the PC to allow configuration changes to take effect. Choose the **Yes** button to restart.



6.2. Setting the IP Information on the Interalia XMU+

The IP information of the XMU+ is set from the menu on the front of the box by navigating through the menu using the left and right arrows and clicking **Enter** for each section that needs changing as highlighted below.

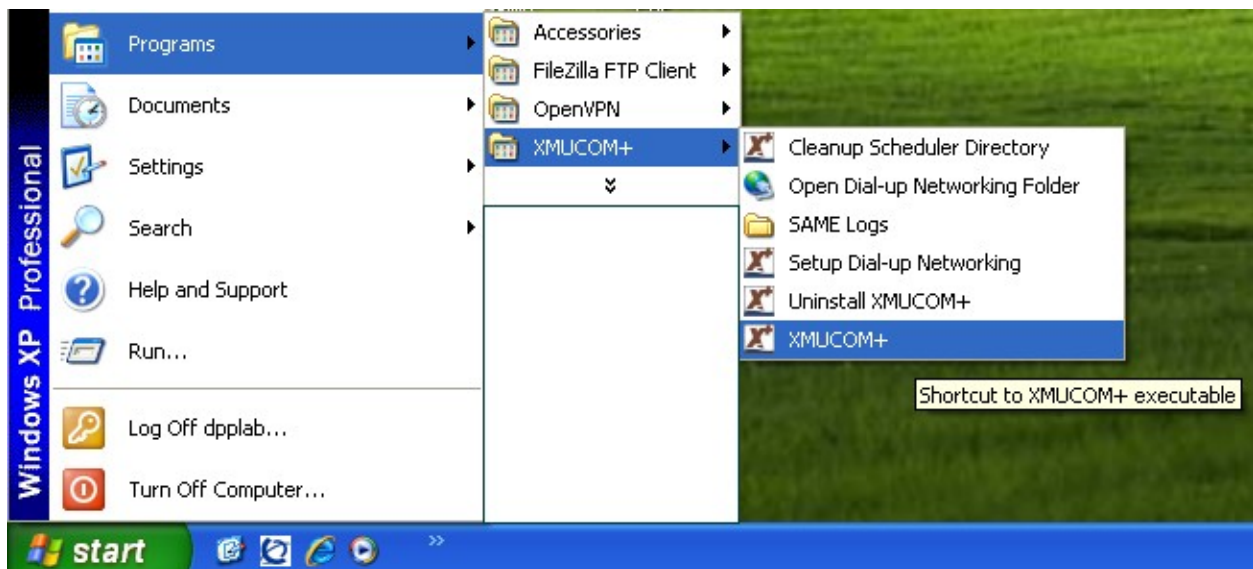


To set the IP information carry out the following steps:

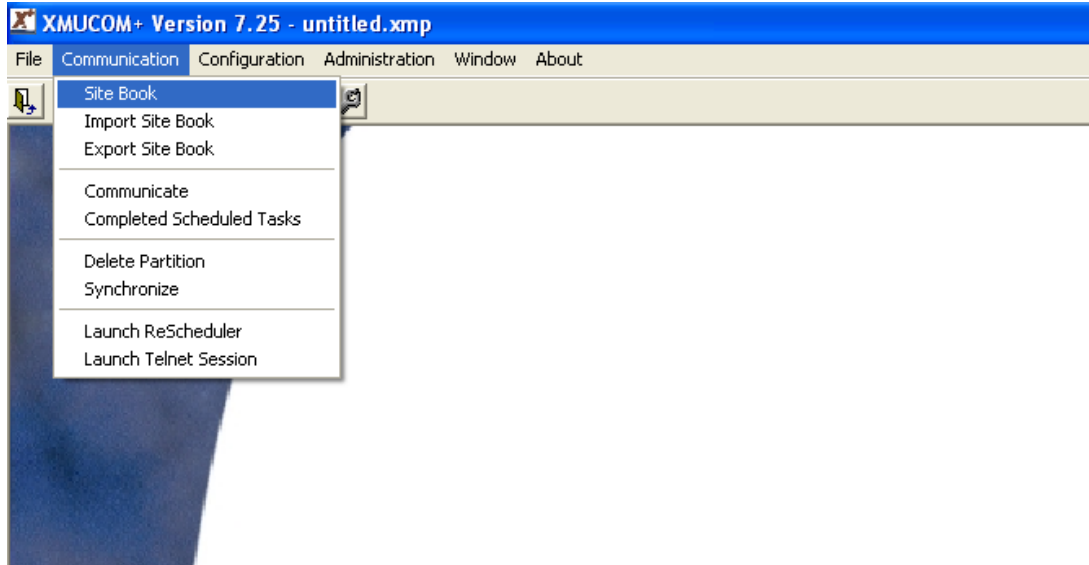
- Navigate to **Main System Menu** and press **Enter**
- Navigate to **System Communications** and press **Enter**
- Navigate to **Communications Ethernet** and press **Enter**
- Navigate to **Ethernet IP address**, enter the IP address and press **Enter**
- Navigate to **Ethernet IP mask**, enter the Subnet Mask and press **Enter**
- Navigate to **Gateway** enter the Default Gateway and press **Enter**

6.3. Create a Site Book on the Interalia XMU+

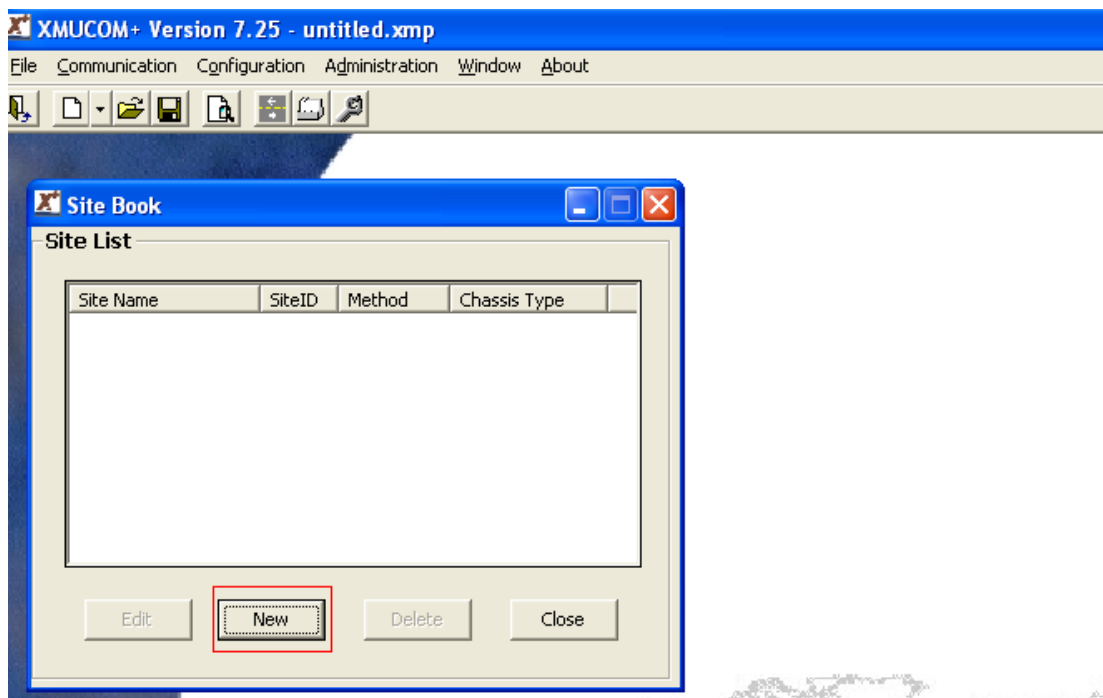
Once installed the XMUCOM+ program can be run from a shortcut on the desktop or by selecting the program as shown below.



Choose the **Communication** menu and select **Site Book** from the drop down menu.



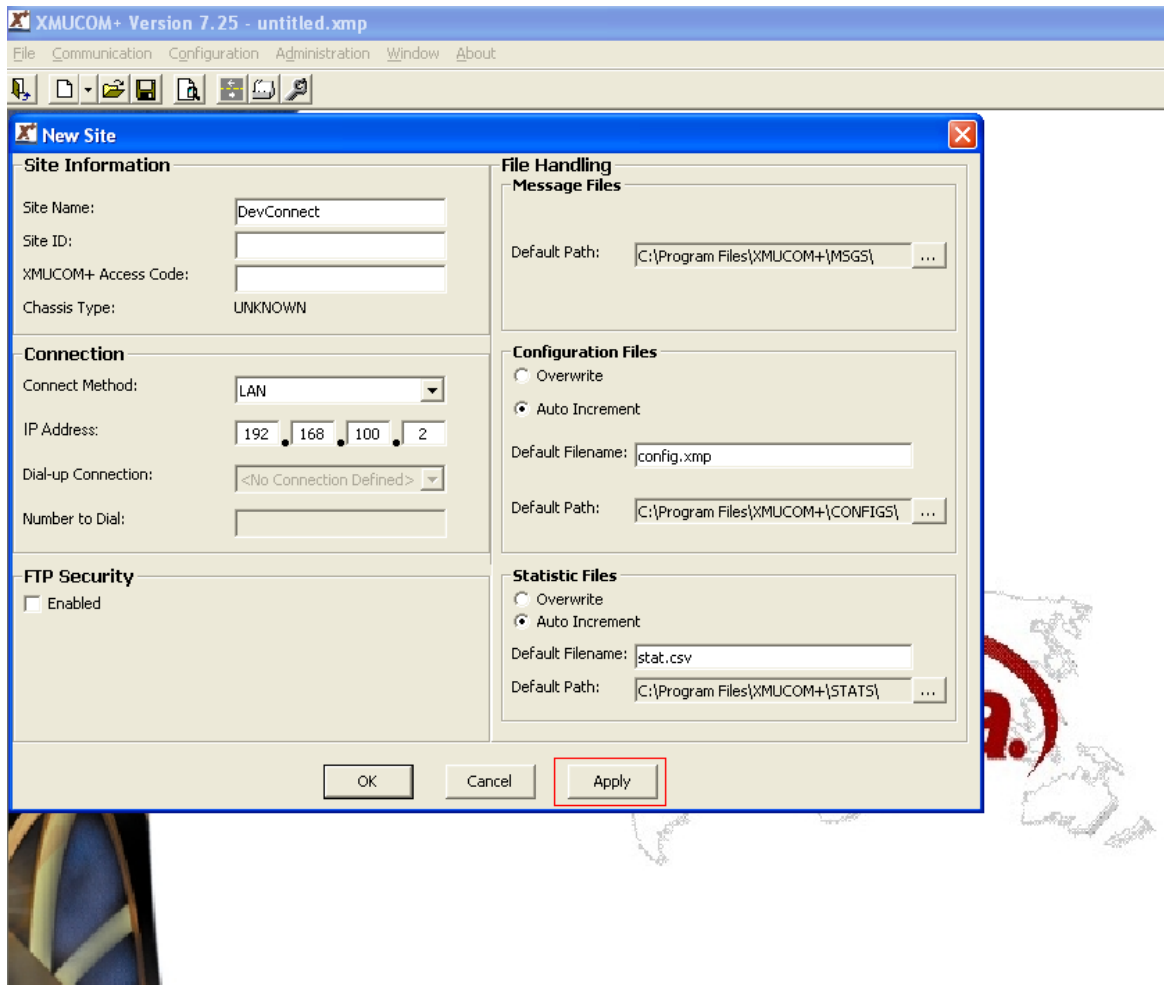
Click on the **New** button.



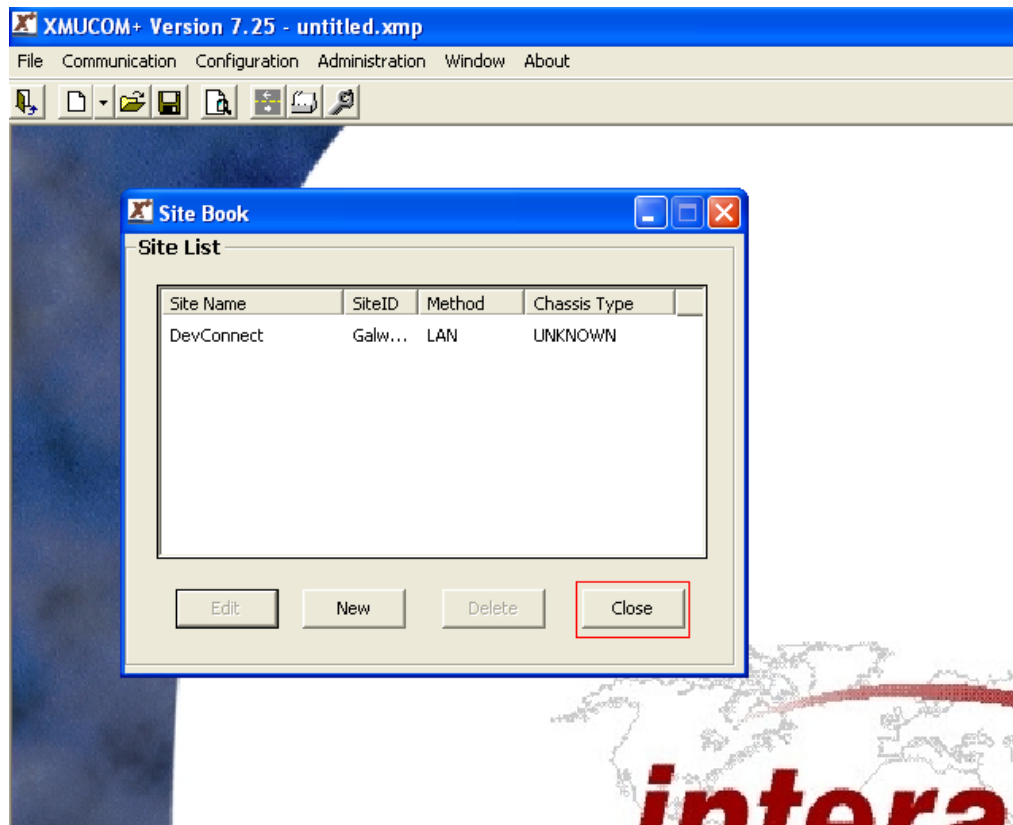
Enter the following.

- **Site Name** Enter a Name for the Site Name
- **Connect Method** LAN was used for Compliance testing
- **IP Address** Enter the IP Address of the XMU+

The **Site ID** and **XMUCOM+ Access Code** can be left blank. Select **Apply** followed by **OK** when all information is entered.



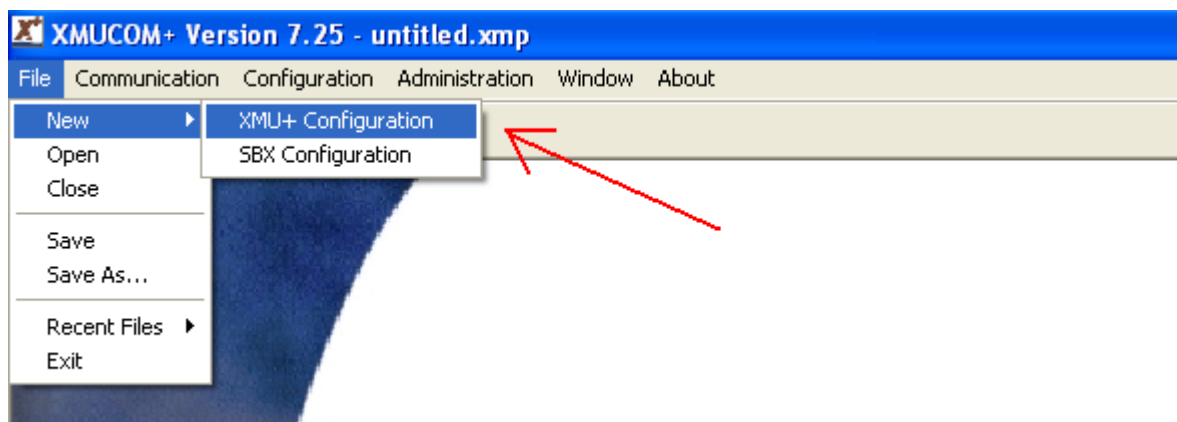
Click the **Close** button. Once the **Site Book** is created it is now possible to continue with the rest of the XMU+ configuration.



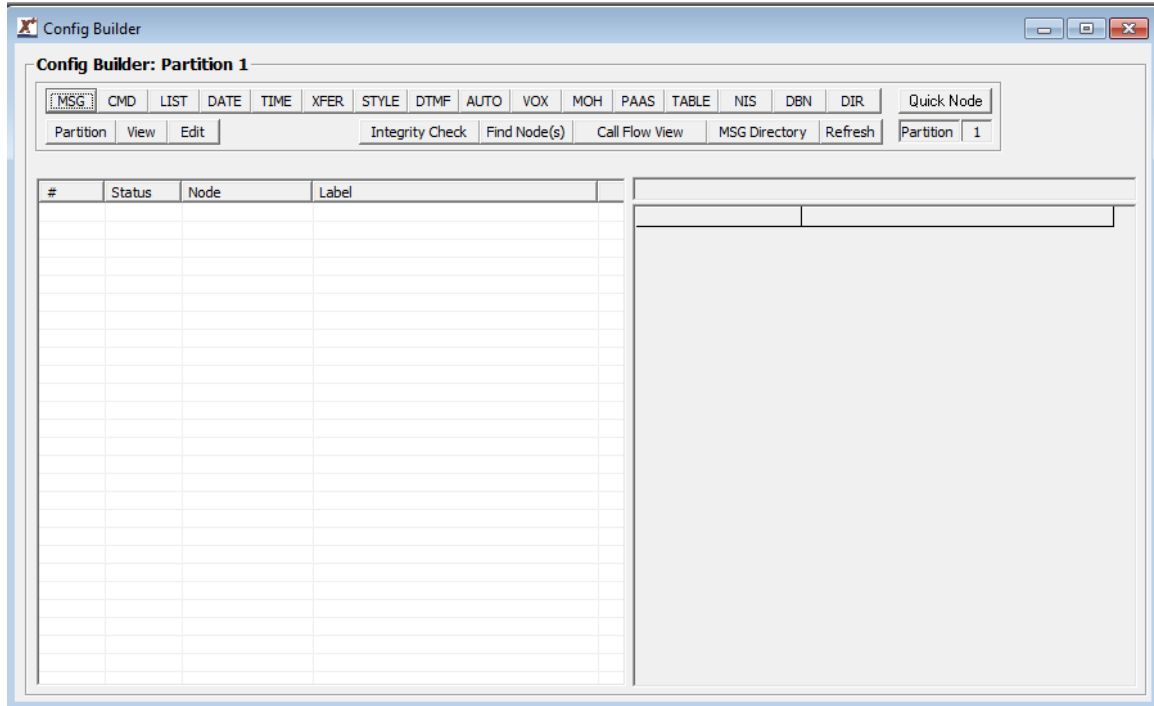
6.4. Configuring Interlalia XMU+ for RAN Announcements

Select **File** → **New** → **XMU+ Configuration**.

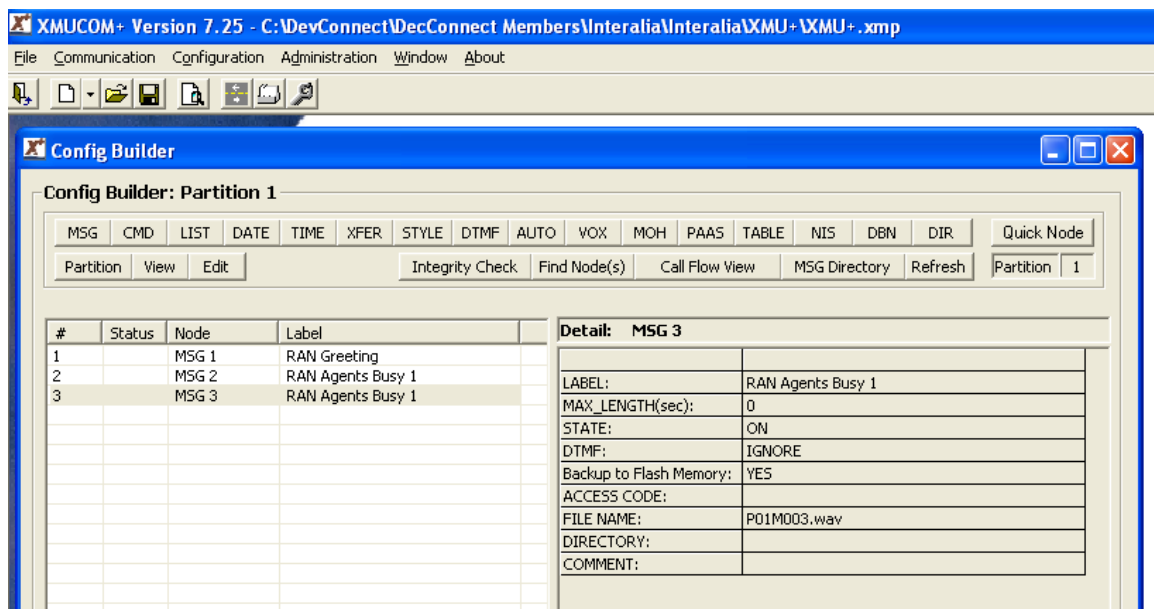
Note: The same program is used to configure the SBX and the XMU+ and the same screen options appear for both.



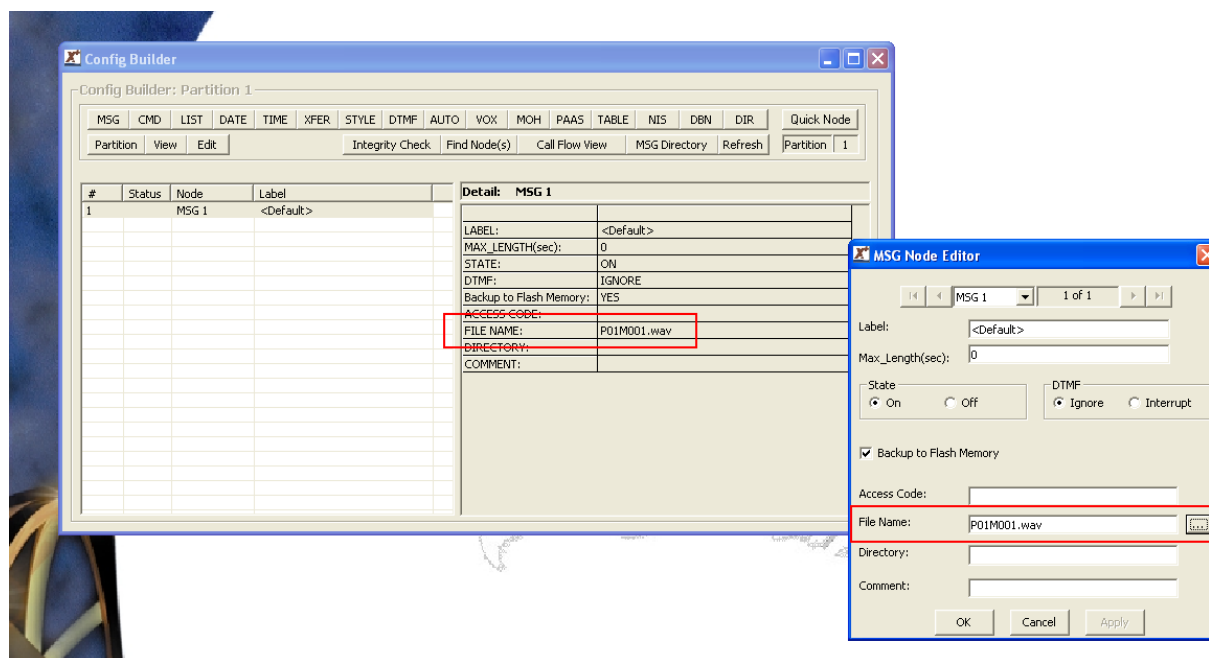
The software then opens with the following blank **Config Builder**.



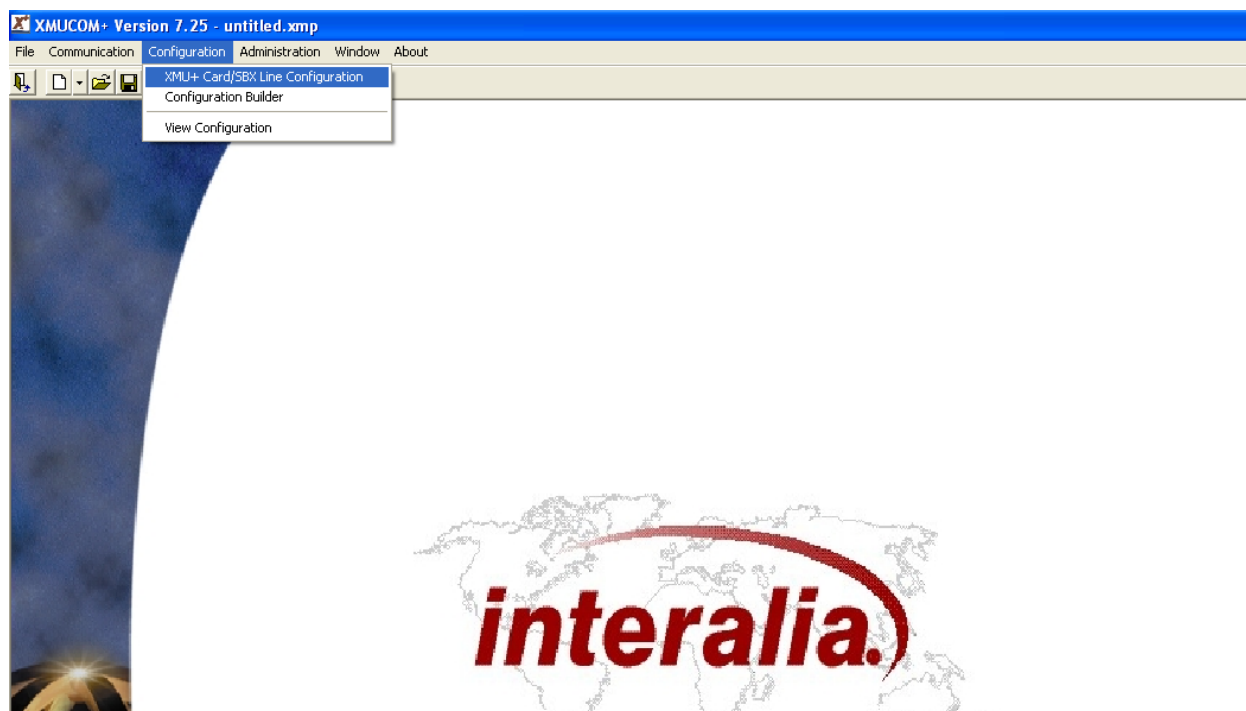
To create 3 simple messages as RAN announcements for an initial greeting and two waiting in queue announcements click on the **MSG** button as highlighted below.



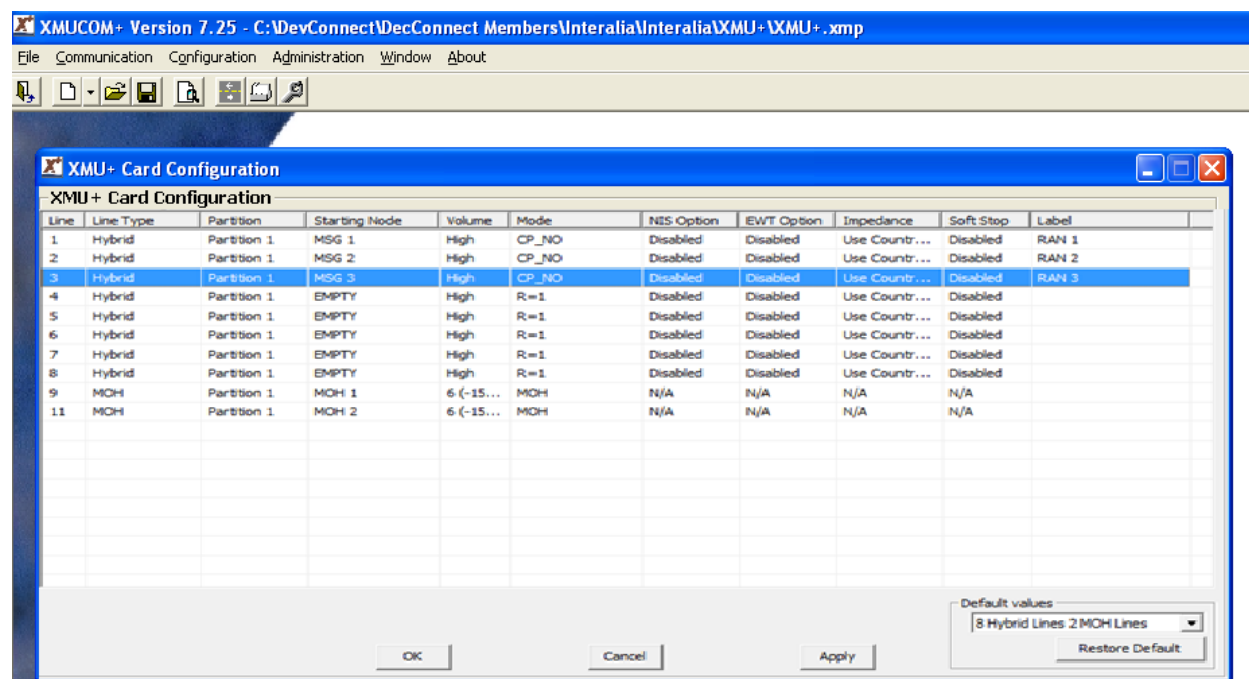
To add specific announcement messages double click on **FILE NAME** highlighted below. This opens the **MSG Node Editor** window. Beside the **File Name** browse to saved announcements in WAV format.



To assign these messages to the XMU+ ports, enter the XMU+ line configuration as shown below.



The XMU+ card set up shows only the first 3 ports in use as the RAN announcements that were previously setup. These can be heard from the PBX by dialing the corresponding extensions on the MP118.



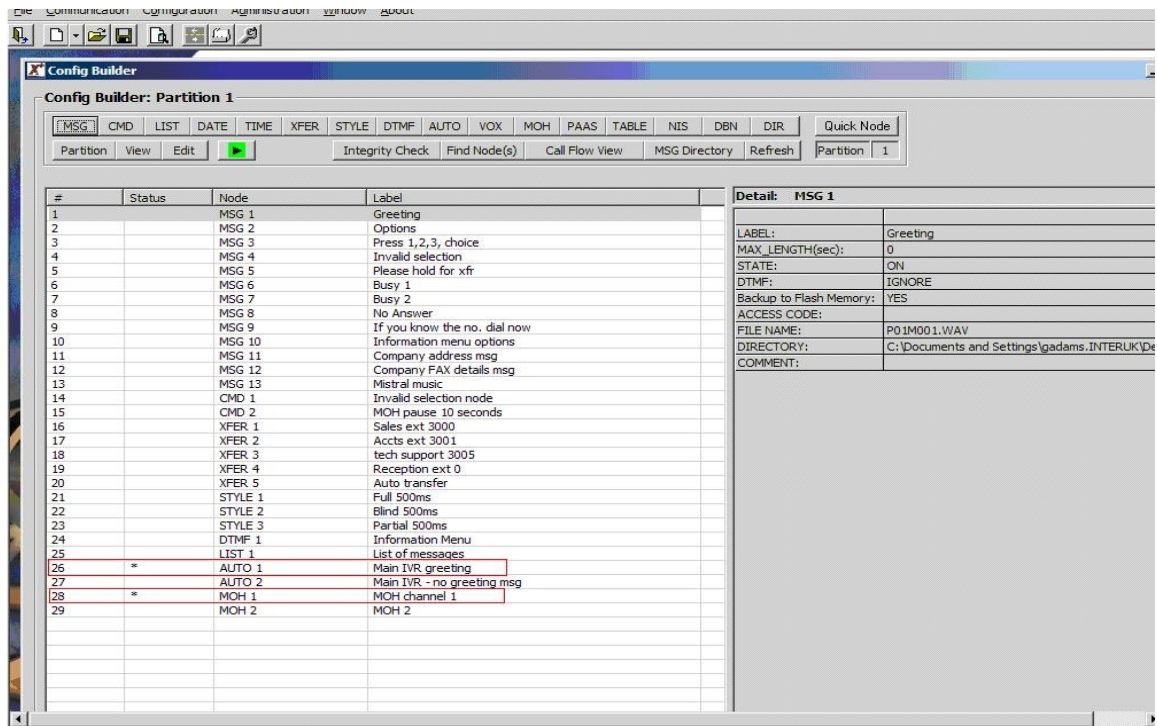
6.5. Configuring the Auto Attendant on the Intermedia XMU+

Open the XMUCOM+ program from the desktop shortcut as before. The **Config Builder** form is displayed which is the main IVR\Auto-Attendant configuration screen. One can populate this form with music and message files as well as IVR greetings. A completed form is displayed below.

#	Status	Node	Label
1		MSG 1	Greeting
2		MSG 2	Options
3		MSG 3	Press 1,2,3, choice
4		MSG 4	Invalid selection
5		MSG 5	Please hold for xfr
6		MSG 6	Busy 1
7		MSG 7	Busy 2
8		MSG 8	No Answer
9		MSG 9	If you know the no. dial now
10		MSG 10	Information menu options
11		MSG 11	Company address msg
12		MSG 12	Company FAX details msg
13		MSG 13	Mistral music
14		CMD 1	Invalid selection node
15		CMD 2	MOH pause 10 seconds
16		XFER 1	Sales ext 3000
17		XFER 2	Accts ext 3001
18		XFER 3	tech support 3005
19		XFER 4	Reception ext 0
20		XFER 5	Auto transfer
21		STYLE 1	Full 500ms
22		STYLE 2	Blind 500ms
23		STYLE 3	Partial 500ms
24		DTMF 1	Information Menu
25		LIST 1	List of messages
26	*	AUTO 1	Main IVR greeting
27		AUTO 2	Main IVR - no greeting msg
28	*	MOH 1	MOH channel 1
29		MOH 2	MOH 2

Detail: MSG 1	
LABEL:	Greeting
MAX_LENGTH(sec):	0
STATE:	ON
DTMF:	IGNORE
Backup to Flash Memory:	YES
ACCESS CODE:	
FILE NAME:	P01M001.WAV
DIRECTORY:	C:\Documents and Settings\lgadams\INTERUK\De
COMMENT:	

Note the highlighted entries in the screen above with an * as their **Status**. Once the configuration is built, the line card needs to be set to **AUTO 1** (shown on the next screen below) as this is the starting node and is shown by the * against its status in the screen **shot** above.



Double-click the entry for the **Node** displaying **AUTO 1** from the **Config Builder** screen above to open it for editing and the **AUTO Node Editor** screen appears as shown below. The screen displays set **Prompts**, **Actions** and **Exceptions**.

Below are examples that were used in testing.

The screenshot shows the **AUTO Node Editor** window. At the top, there's a title bar and a navigation area with buttons for back, forward, and a dropdown menu showing **AUTO 1** and **1 of 2**. The main area is divided into three sections: **Prompts**, **Actions**, and **Exceptions**, each with a table and control buttons.

Prompts Section:

Order	Command/Node	Label
1	MSG 1	Greeting
2	MSG 9	If you know the ...
3	MSG 2	Options

Buttons: Add, Insert, Remove, Edit, Up, Down, Quick Assign.

Actions Section:

Entry	Command/Node	Label
1-1	XFER 1	Sales ext 3000
2-2	XFER 2	Accts ext 3001
3-3	XFER 3	tech support 3005
4-4	DTMF 1	Information Menu
3000-3010	XFER 5	Auto transfer
62000-63000	XFER 5	Auto transfer

Buttons: Add, Insert, Remove, Edit, Up, Down, Quick Assign.

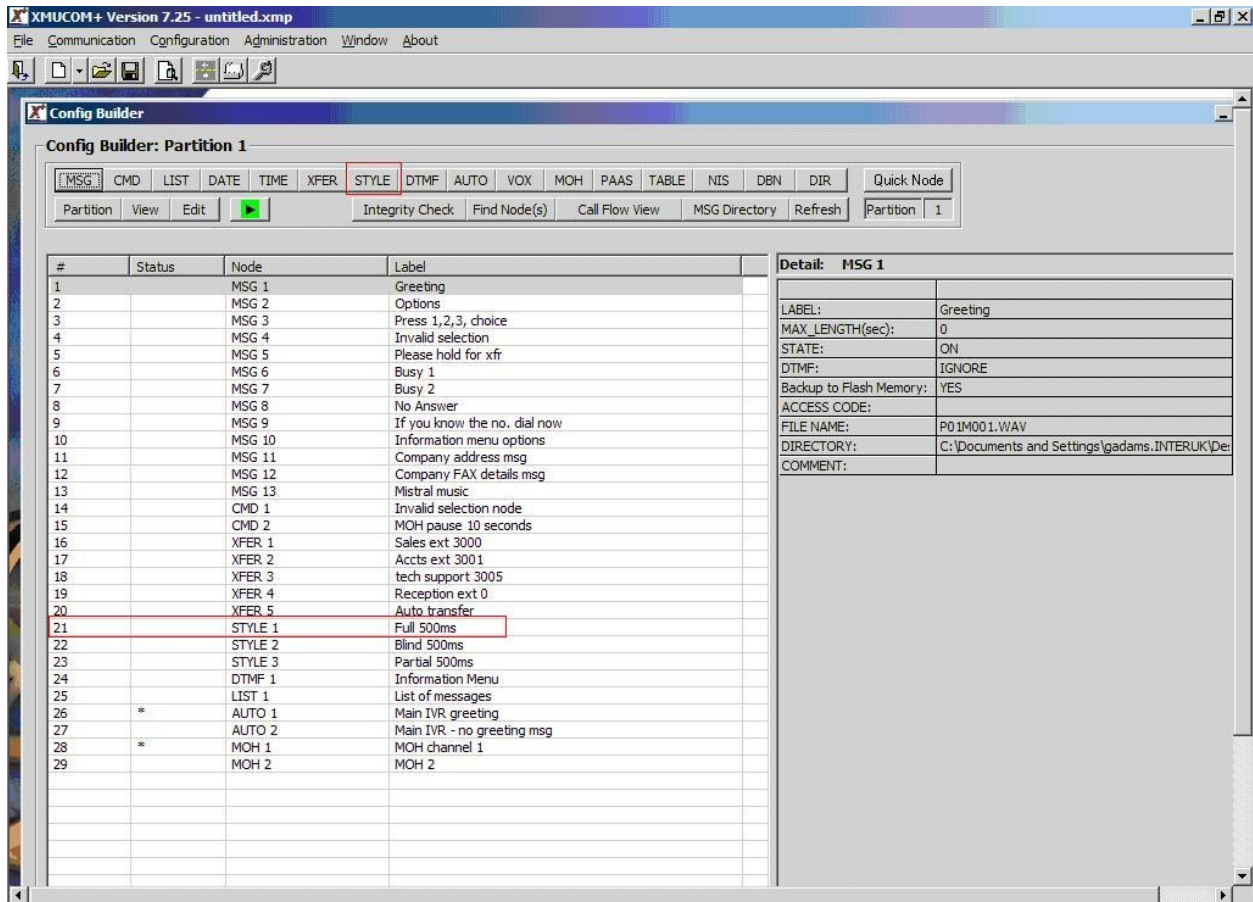
Exceptions Section:

	Command/Node	Label
Timeout	XFER 4	Reception ext 0
Invalid	CMD 1	Invalid selection ...
Abort	XFER 4	Reception ext 0
*	NOOP	
#	NOOP	

Buttons: Edit, Default.

At the bottom of the window are buttons for **OK**, **Cancel**, and **Apply**.

Incoming calls are directed to the Table which plays message 1, 2, or 3 depending on the time of day, calls then go to the Auto Node where a known extension can be dialed, listen to a recorded bulletin message or get transferred to a queue. In order to manage a call, the XMU+ will monitor for a busy or no answer indication, this is achieved by setting the Style node. Create a Style node through the **STYLE** tab as highlighted below. In the configuration builder note the three transfer styles that require setting (Blind, Partial or Full).



Double click the **STYLE1** entry from the **Config Builder** screen which is highlighted in the screen above as **Line 21**. The **STYLE 1** entry below will appear so the settings can be reviewed and edited. The transfer style shows the **Hook Flash (msec)** being set as **500** in order to perform the transfer / retrieval of a call. To detect the Busy status, the **Busy On (msec)** is set to **600**, the **Busy Off (msec)** is set to **400**, the **Ring On (msec)** is set to **200** and the **Ring Off (msec)** is set to **4000**.

STYLE Node Editor

STYLE 1 1 of 1

Label: Full 500ms

Supervised

☐ BLIND ☐ PARTIAL ☒ FULL

☐ DIALCONTINUE ☐ ENHANCED

Hook Flash (msec): 500

Transfer: !,,

Disconnect:

Threshold: High

Retrieve: !

Busy Retry (sec): 4

Num Retries: 3

Ring Limit: 5

Busy On (msec): 600

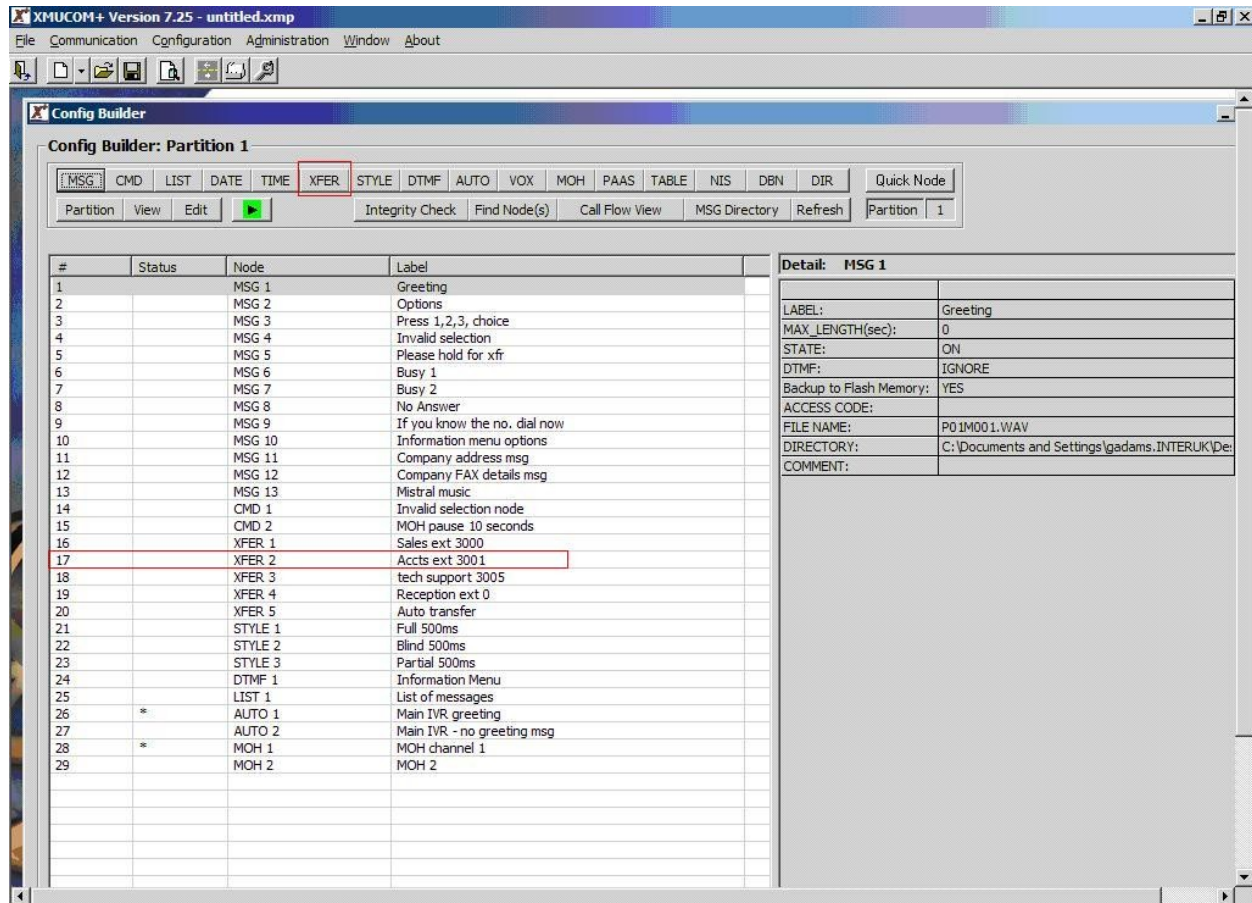
Busy Off (msec): 400

Ring On (msec): 2000

Ring Off (msec): 4000

OK Cancel Apply

Alter the Hook Flash values according to the call progress tones set for country option. During the monitoring of a call, it is possible to inform the caller of their progress. In the main **Config Builder** window you can edit calls transfers i.e. **XFER 2**. Click on the **XFER** node as highlighted in the diagram below.



By double clicking the **XFER 2** entry from the **Config Builder** screen highlighted in the screen above, the **XFER 2** entry below will appear so the settings can be reviewed and edited. If the extension is busy, messages 6 and 7 (**MSG 6** and **MSG 7**) will play according to the Xfer Style (Num Retries). If there is no answer, then the **No Answer** message (**MSG 8**) is set to play.

XFER Node Editor

Navigation: [Previous] [XFER 2] [Next] 2 of 5

Label:

Dial:

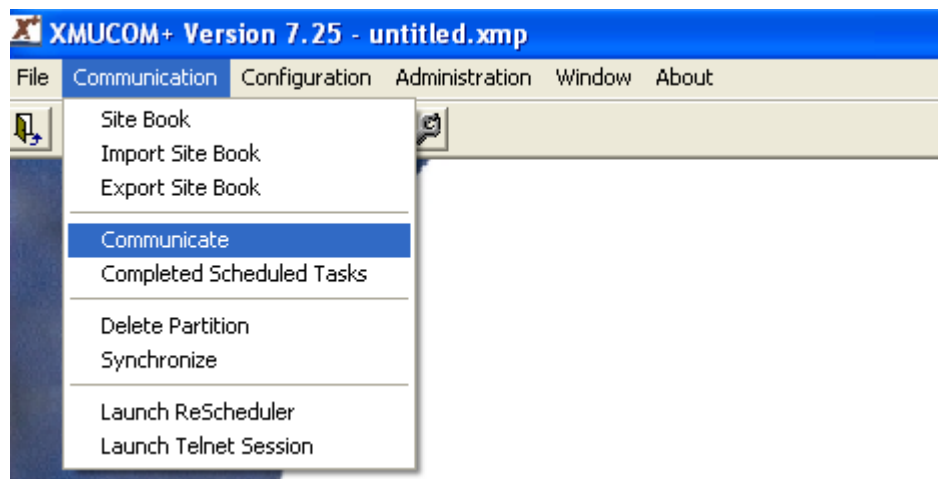
Style: Full 500ms

	Command/Node	Label
Hold	MSG 5	Please hold for xfr
MOH	NOOP	
Busy 1	MSG 6	Busy 1
Busy 2	MSG 7	Busy 2
No Answer	MSG 8	No Answer
Answer	BEEP	

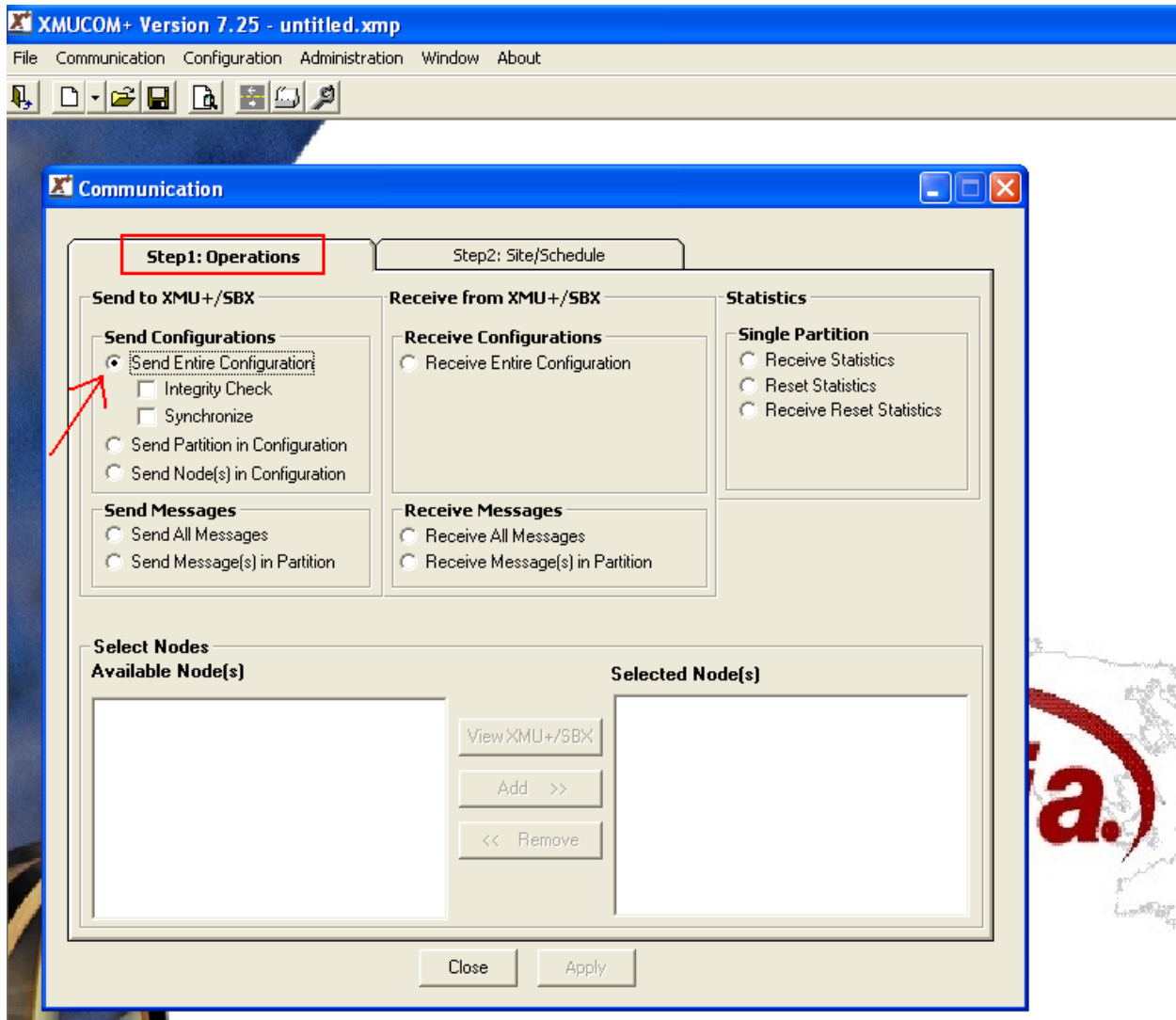
Buttons: Edit, Default, OK, Cancel, Apply

6.6. Downloading Configuration to the Intermedia XMU+

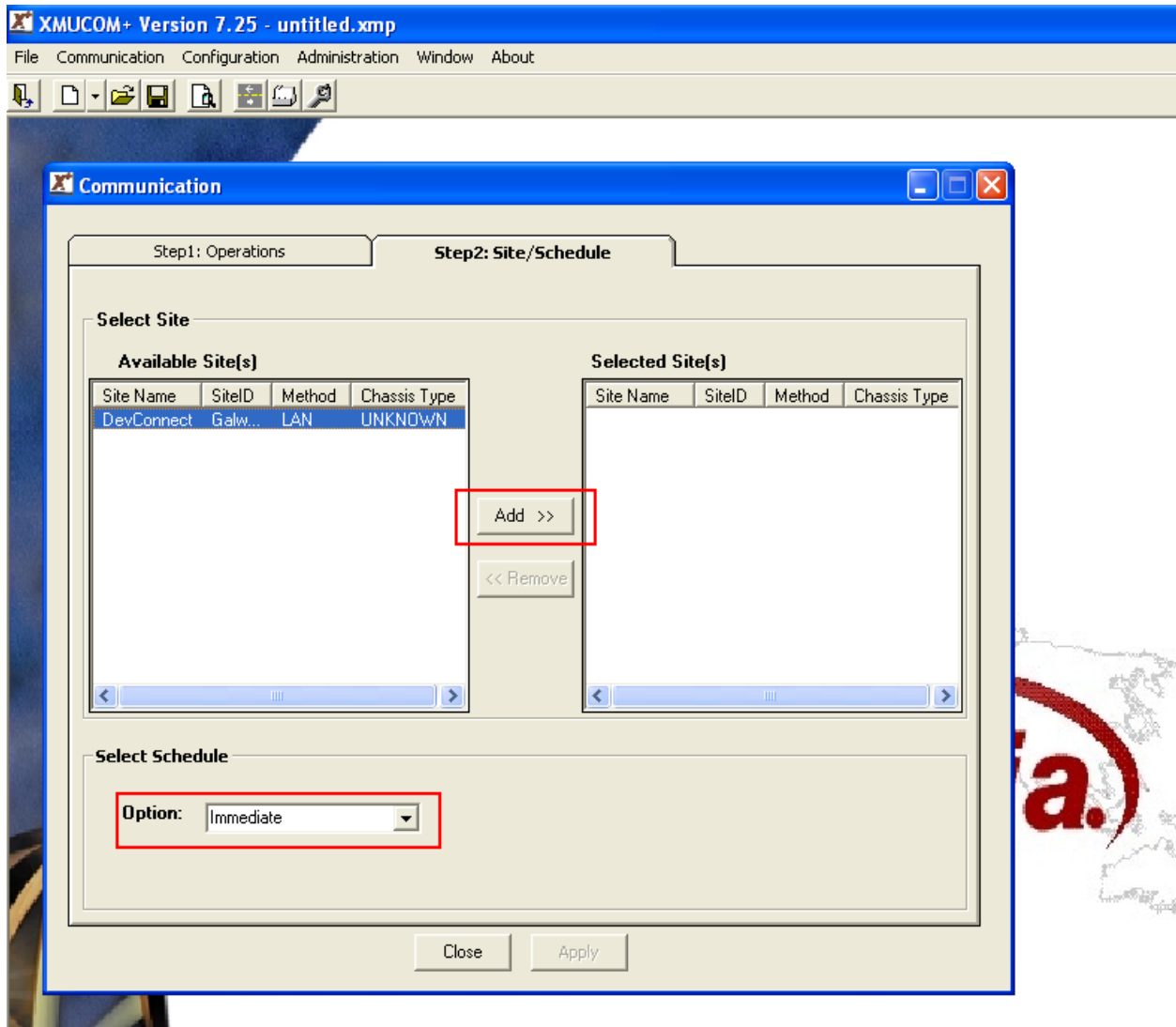
Once all the relevant information is configured it must be downloaded to the XMU+. To download the configuration to the XMU+ complete the following steps. Choose the **Communicate** from the **Communication** menu.



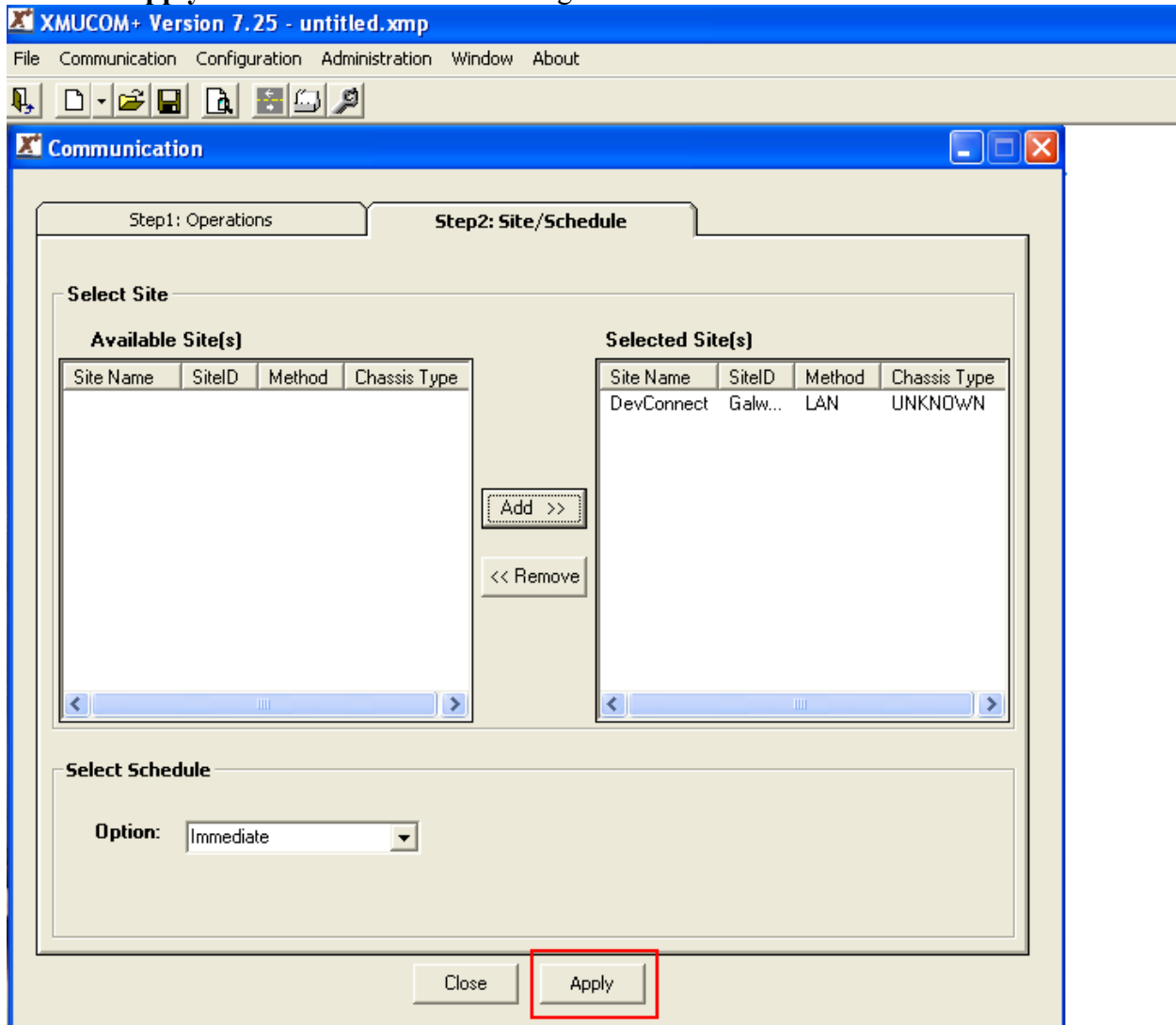
In the **Communication** Window, select tab **Step 1: Operations** and check the **Send Entire Configuration** button.



Select tab **Step2: Site/Schedule** and choose the site followed by clicking the **Add >>** button. **Select Schedule Option** can be set to **Immediate**.

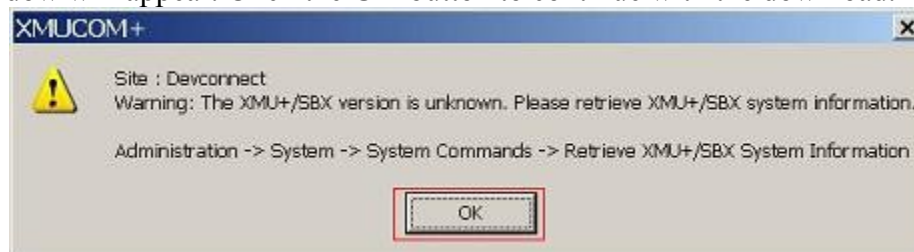


Click the **Apply** button to download the configuration to the XMU+.



The download process could take some time depending on the speed of the selected communication connection and the number of messages being downloaded. XMUCOM+ will display a response dialog box while sending the messages, and notifies when all messages are sent.

Note: If this is the first time downloading to the XMU+, the Chassis Type will be unknown and a warning window will appear. Click the **OK** button to continue with the download.



7. Verification Steps

This section provides the tests that can be performed to verify correct configuration of the CS1000E, XMU+ using a T1 connection.

7.1. Status of the Analog Extensions on the Avaya Communication Server 1000E

Check the status of the analog extensions by running the command **STAT LSC (loop shelf card)** in overlay 20 as shown below to ensure all extensions appear **IDLE**.

LD 20

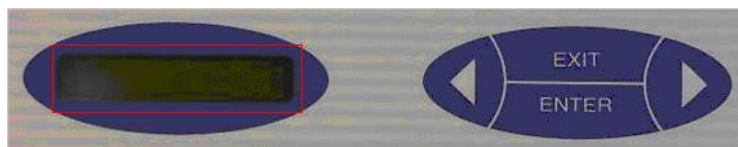
Prompt	Response	Description
>	LD 20	Enter Overlay 20
>	STAT 4 0 4	Stat Loop Shelf Card

Example:

REQ: stat 4 0 7		
00 = UNIT 00 = IDLE	(500)	
01 = UNIT 01 = IDLE	(500)	
02 = UNIT 02 = IDLE	(500)	
03 = UNIT 03 = IDLE	(500)	
04 = UNIT 04 = UNEQ		
05 = UNIT 05 = UNEQ		
06 = UNIT 06 = UNEQ		
07 = UNIT 07 = UNEQ		

7.2. Verify Interalia XMU+ Status

The **Status** window, as highlighted below, on the display on the front of the XMU+ can be used to verify the communication of the XMU+. It is accessible by pressing the right arrow to enter the Status window. This shows the call flow as calls are made and received by the interactive voice response system.



8. Conclusion

These Application Notes describe the configuration steps required for Interalia XMU+ to successfully interoperate with Avaya Communication Server 1000E using a T1 Line Side connection. All functionality and serviceability test cases were completed successfully.

9. Additional References

This section references the Avaya and Interalia product documentation that are relevant to these Application Notes.

Product documentation for Avaya products may be found at <http://support.avaya.com>

- [1] Input Reference Administration Avaya Communication Server 1000, Release 7.5;
Document No. NN43001-611_05.02, Dec 2010

The Interalia documentation can be found at the following location:

<http://www.interalia.com/Products/XMU/XMU-Overview>

Appendix

CS1000E Software and patch list

VERSION 4121

RELEASE 7

ISSUE 50 Q +

DepList 1: core Issue: 01 (created: 2011-03-15 10:26:33 (est))

IN-SERVICE PEPS

PAT#	CR #	PATCH REF #	NAME	DATE	FILENAME	SPECINS
000	wi00688505	ISS1:1OF1	p30595_1	14/06/2011	p30595_1.cpl	NO
001	wi00835294	ISS1:1OF1	p30565_1	14/06/2011	p30565_1.cpl	NO
002	wi00832106	ISS1:1OF1	p30550_1	14/06/2011	p30550_1.cpl	NO
003	wi00837618	ISS1:1OF1	p30594_1	14/06/2011	p30594_1.cpl	NO
004	wi00852365	ISS1:1OF1	p30707_1	14/06/2011	p30707_1.cpl	NO
005	wi00843623	ISS1:1OF1	p30731_1	14/06/2011	p30731_1.cpl	YES
006	wi00839255	ISS1:1OF1	p30591_1	14/06/2011	p30591_1.cpl	NO
007	wi00832626	ISS2:1OF1	p30560_2	14/06/2011	p30560_2.cpl	NO
008	wi00857566	ISS1:1OF1	p30766_1	14/06/2011	p30766_1.cpl	NO
009	wi00841980	ISS1:1OF1	p30618_1	14/06/2011	p30618_1.cpl	NO
010	wi00837461	ISS1:1OF1	p30597_1	14/06/2011	p30597_1.cpl	NO
011	wi00839821	ISS1:1OF1	p30619_1	14/06/2011	p30619_1.cpl	NO
012	wi00842409	ISS1:1OF1	p30621_1	14/06/2011	p30621_1.cpl	NO
013	wi00838073	ISS1:1OF1	p30588_1	14/06/2011	p30588_1.cpl	NO
014	wi00850521	ISS1:1OF1	p30709_1	14/06/2011	p30709_1.cpl	YES
015	wi00860722	ISS1:1OF1	p30784_1	14/06/2011	p30784_1.cpl	YES
016	wi00839134	ISS1:1OF1	p30698_1	14/06/2011	p30698_1.cpl	YES
017	wi00836981	ISS1:1OF1	p30613_1	14/06/2011	p30613_1.cpl	NO

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