



Avaya Solution & Interoperability Test Lab

Application Notes for the Interoperation of NovaLink NovaTax with Avaya Communication Server Integral 55 LX - Issue 1.1

Abstract

These Application Notes describe the necessary configuration steps for the successful interoperation of the NovaLink NovaTax with the Avaya Communication Server Integral 55 LX.

NovaLink NovaTax is a proprietary charging data solution.

An Avaya Communication Server Integral 55 LX with software version L03 GA was used as the hosting PBX for the NovaTax system.

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

This document specifies the configurations and tests used to verify compatibility and interoperability between the NovaTax Server and the Avaya Communication Server Integral 55 LX (I55LX). A V.24 interface with ACOM protocol is used for connecting the Avaya I55 LX. The NovaTax server provides detailed control of telecommunication charging data of the Avaya I55 LX.

The figure below shows the interconnection of the NovaLink NovaTax system with the Avaya I55 LX.

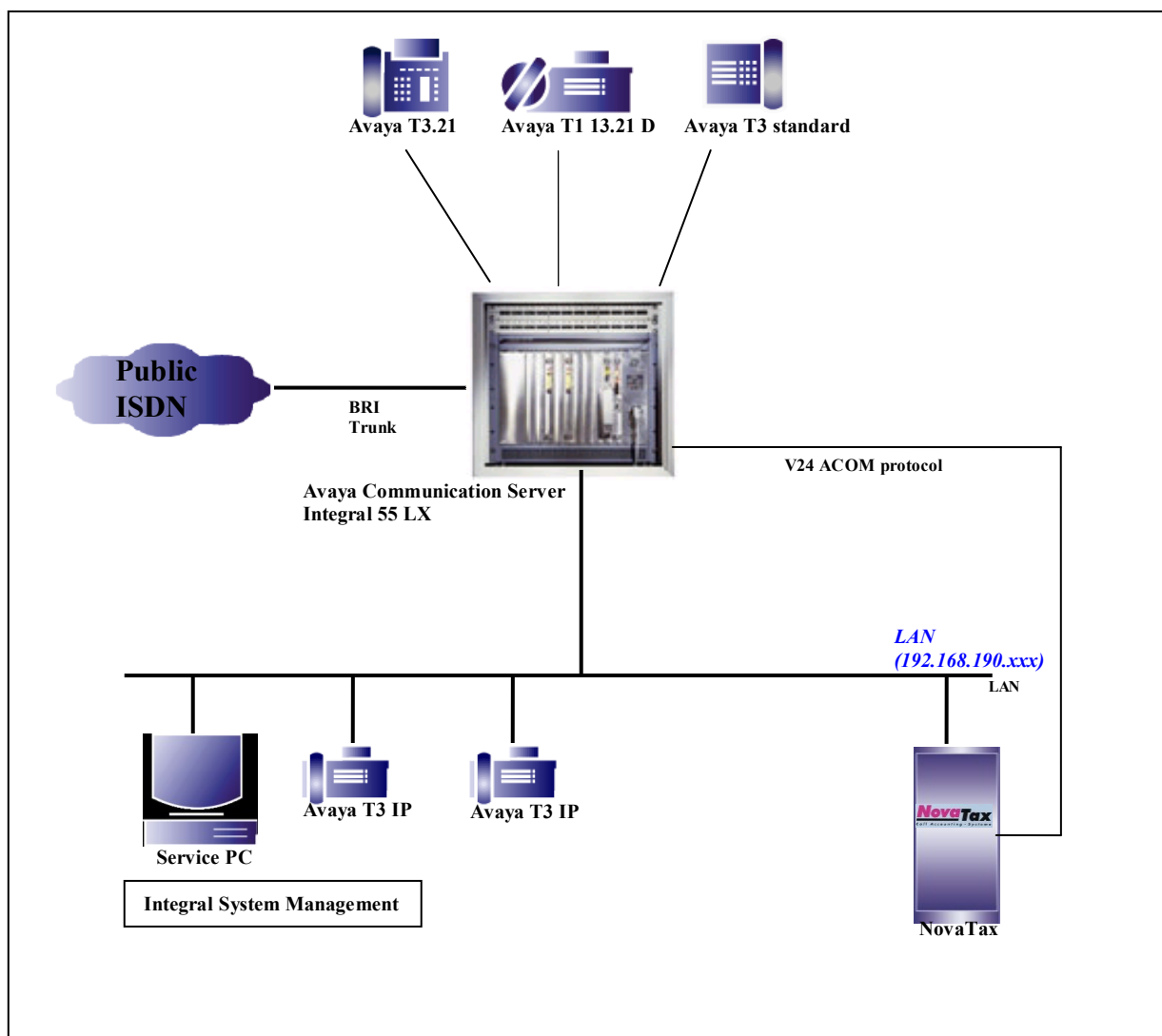


Figure 1: Avaya I55 LX with NovaLink NovaTax Server

2. Equipment and Software Validated

The following equipment and software were used for the sample configuration provided:

Equipment	Software
Avaya™ Communication Server Integral 55 LX	L030V00_1_5.1
Avaya™ DT21 circuit pack	Loading list: DT200100 SW-File: DT210016.ICP
Avaya™ UIP circuit pack	Loading list: UIP05100 1.SW-File:UIPOB051.ICP 2.SW-File:UIPOB151.ICP
Avaya™ ACB circuit pack	Platform version: V4.0.16
Avaya™ CF22 circuit pack	Loading list: MSC20201 1.SW-File:MSC2S001.ICP 2.SW-File:MSC202T3.ICP 3.SW-File:MSC202D3.ICP 4.SW-File:MSC20204.ICP
Avaya™ ASCEU circuit pack	Loading list:ASCEU000 1.SW-File:ASCCD002.ICP 2.SW-File:ASCEU023.ICP
Avaya™ Integral System Management (ISM)	V13.003
Avaya™ ComMan	V4401
Avaya™ ICU Editor	V13.004
Avaya™ T3 IP Comfort	Bootloader: B01.03 SW: T323_0DE.h3i
Avaya™ T3.21	Bootloader: V00.09 SW: T314_0DE.hx1
Avaya™ T3 analogue phone (standard)	-
Avaya™ V.24 with ACOM protocol	-
Service PC Dell optiplex gx270	Microsoft Windows XP Professional SP2
Deutsche Telekom BRI ISDN trunk (point to point)	-
Numbering plan: 4 digits	-
NovaLink NovaTax Server	V. 4.0

3. Configuration of the Avaya I55 LX

The configuration of the Avaya I55 LX is done via the Integral System Management (ISM) and its components which are running on a Service PC connected to the system via the LAN. ISM is the basic service tool for administrating the Avaya I55 systems. It is an application running under Windows-2000 or Windows-XP operating system. The following ISM components are used for the configuration:

ICU Editor - For administrating the various circuit packs of the system.

Transparent console **MML** - For administrating the entire Avaya I55 LX system.

The ISM is opened by default with username n1 and password p1.



The image shows a Windows-style login window titled "Benutzer LOGIN". The window has a light gray background. In the center, there is a white rectangular area containing the red "AVAYA" logo, the text "I S M" in large black letters, and "Integral System Management" in smaller black letters. Below this, in red, is the copyright notice "© Avaya-Tenovis GmbH & Co KG". Below the central area, there are two input fields: "Benutzername" with the text "n1" and "Paßwort" with the text "**". At the bottom of the window, there are three buttons: "OK", "Abbrechen", and "Sprache >>".

In order to access the Avaya I55 LX via the LAN, Customer Administration data must be entered:

Software version: IEE3

User name: xxxxxx (default username)

Password: xxxxxx (default password)

MML password: xxxxxxxxxx (default MML password)

IP Address of the system

Kundenverwaltung

Kunde:

PABX:

Rufnummer Intern

Rufnummer Extern

Zugang

☒ Intern ☐ Extern + AKZ

☐ Extern ☐ Extern + LDD

IP Adresse

ISDN Schnittstelle

Ethernet Schnittstelle

TUX

☒ Ethernet ☐ ISDN

☐ USB ☐ ISDN über Router

Benutzername:

Paßwort für die TK-Anlage:

Paßwortbestätigung

MML Passwort

Paßwortbestätigung

PPP Passwort

☒ Passwort der TK-Anlage benutzen

PPP Passwort

Paßwortbestätigung

3.1. Configurations of the components

For this test, the second V.24 Interface of the AEV24W cable adapter which by default is the V.24 pascal interface was changed to the charging data interface.

These changes must be made by means of the ISM web browser:

Configuration Management/Change Configuration/logicalDevice

The logicalDevices CO-01-1 and CO-01-3 which by default are set to tty1 are changed to “NULL”.

Rows 1 to 20 of 35 ➡

<input type="checkbox"/>	logicalName	lgn	number	pdn	deviceName	ldIndex
<input type="checkbox"/>	ACT-LOG	180	17168	769	HDD4	47
<input type="checkbox"/>	AIC-DEV	171	17168	769	HDD1	48
<input type="checkbox"/>	CO-01-1	173	17153	257	tty1	2
<input type="checkbox"/>	CO-01-3	173	17155	257	tty1	4
<input type="checkbox"/>	CO-02-1	173	17156	258		6
<input type="checkbox"/>	CO-02-3	173	17158	258		8
<input type="checkbox"/>	CO-03-1	173	17159	259		10
<input type="checkbox"/>	CO-03-3	173	17161	259		12
<input type="checkbox"/>	CO-04-1	181	17171	261		24
<input type="checkbox"/>	CO-04-3	181	17173	261		26
<input type="checkbox"/>	CO-05-1	182	17174	262		28
<input type="checkbox"/>	CO-05-3	182	17176	262		30
<input type="checkbox"/>	DC-01	173	17190	267		44
<input type="checkbox"/>	HS-01	171	17168	769	HDD1	17
<input type="checkbox"/>	HS-01#1	171	17168	769	HDD1	18
<input type="checkbox"/>	HS-02	171	17169	770	HDD2	19
<input type="checkbox"/>	HS-02#1	171	17169	770	HDD2	20
<input type="checkbox"/>	RP-01	173	17167	1537		16
<input type="checkbox"/>	S01-LOG	180	17168	769	HDD6	45
<input type="checkbox"/>	S01-OUT	171	17168	769	HDD1	46

[Select all](#) [Invert selection](#)

Edit selected rows

The deviceName of the two logicalDevices are set to NULL.

Rows 1 to 20 of 35 ➡

logicalName	lgn	number	pdn	deviceName	ldIndex
ACT-LOG	180	17168	769	HDD4	47
AIC-DEV	171	17168	769	HDD1	48
CO-01-1	173	17153	257	NULL	2
CO-01-3	173	17155	257	NULL	4
CO-02-1	173	17156	258		6
CO-02-3	173	17158	258		8
CO-03-1	173	17159	259		10
CO-03-3	173	17161	259		12
CO-04-1	181	17171	261		24
CO-04-3	181	17173	261		26
CO-05-1	182	17174	262		28
CO-05-3	182	17176	262		30
DC-01	173	17190	267		44
HS-01	171	17168	769	HDD1	17
HS-01#1	171	17168	769	HDD1	18
HS-02	171	17169	770	HDD2	19
HS-02#1	171	17169	770	HDD2	20
RP-01	173	17167	1537		16
S01-LOG	180	17168	769	HDD6	45
S01-OUT	171	17168	769	HDD1	46

Save Cancel

Then these settings have to be saved.

On the next page of the logicalDevices (rows 21 to 35 of 35), the deviceName of logicalDevice ZG-01 which by default is unassigned is set to acom1.

← Rows 21 to 35 of 35

	logicalName	lgn	number	pdn	deviceName	ldIndex
<input type="checkbox"/>	STAT-01	171	17168	769	HDD1	49
<input type="checkbox"/>	TC-01-1	173	17180	1792	tco2	33
<input type="checkbox"/>	TC-01-3	173	17182	1792	tco1	35
<input type="checkbox"/>	TC-02-1	173	17183	1792	tco4	37
<input type="checkbox"/>	TC-02-3	173	17185	1792	tco3	39
<input type="checkbox"/>	TC-03-1	173	17186	1792	tco6	41
<input type="checkbox"/>	TC-03-3	173	17188	1792	tco5	43
<input type="checkbox"/>	TC-04-1	173	17189	1792	tco8	45
<input type="checkbox"/>	TC-04-3	173	17191	1792	tco7	47
<input type="checkbox"/>	VC-01	173	17166	264		15
<input type="checkbox"/>	VC-02	184	17177	266		31
<input type="checkbox"/>	ZG-01	173	17164	260		13
<input type="checkbox"/>	ZG-02	183	17165	265		14
<input type="checkbox"/>	ZGDE-HD	180	17170	771	HDD5	21
<input type="checkbox"/>	ZGDE-SA	171	17170	771	HDD3	22

Select all Invert selection
Edit selected rows

← Rows 21 to 35 of 35

logicalName	lgn	number	pdn	deviceName	ldIndex
STAT-01	171	17168	769	HDD1	49
TC-01-1	173	17180	1792	tco2	33
TC-01-3	173	17182	1792	tco1	35
TC-02-1	173	17183	1792	tco4	37
TC-02-3	173	17185	1792	tco3	39
TC-03-1	173	17186	1792	tco6	41
TC-03-3	173	17188	1792	tco5	43
TC-04-1	173	17189	1792	tco8	45
TC-04-3	173	17191	1792	tco7	47
VC-01	173	17166	264		15
VC-02	184	17177	266		31
ZG-01	173	17164	260	acom1	13
ZG-02	183	17165	265		14
ZGDE-HD	180	17170	771	HDD5	21
ZGDE-SA	171	17170	771	HDD3	22

Save Cancel

Then these settings have to be saved.

Only one channel which is described with ZG-01 must be enabled by the MML Task. The MML Task is integrated in ISM, it is the transparent console (TCO) to configure the I55. In this test: Channel 9:

```

PROL<1:vgde;
Command processing in progress !
VGDE<knau;
VGDE<knaz:9;
  Display channel                                     20-03-07 17:39:51
-----
Chan. no. 9

-----
Output medium      : ZG-01  File name      : SQV:GEBUEH.DAT.016
File size         : 0      File frame no. : 0
Charac. code     : ascii  Format number   : 10
Rec. frame no.   : 0      Block size     : 1
Block frame no.  : 0      Block Add-charac.: 0
Crit. rec. select.:
Crit. file suppr.:
Spare channel     : 9      Chann. type    : zgde
Single-block outp.: JA    Slow device    : NEIN
Special channel   : JA    Half-duplex chan.: 9
Volume identifier :
Record blocking   : NEIN  Label standard : ansi_standard
Number of blocks  : 0      Record density: 1600_bpi_pe
OLT memory medium : keins  Autom. switch-back: JA
OLT GDS number    : 10
OLT timer value   : 1

Administration Parameters

Chann. status     : GESCHLOSSEN
Device status     : BETRIEBSBEREIT
Failure status    : HAUPT KANAL
Failure charge meter : 51
  
```

Enable channel 9:

```
VGDE<knsa:9,ein;
```

```
/* Command successfully processed */
```


The Channel status then is active (AKTIV):

```
VGDE<knaz:9;
Display channel
-----
Chan. no. 9

-----
Output medium      : ZG-01   File name       : SQV:GEBUEH.DAT.017
File size         : 0       File frame no.  : 0
Charac. code      : ascii   Format number   : 10
Rec. frame no.    : 0       Block size      : 1
Block frame no.   : 0       Block Add-charac.: 0
Crit. rec. select.:
Crit. file suppr.:
Spare channel     : 9       Chann. type      : zgde
Single-block outp.: JA      Slow device     : NEIN
Special channel   : JA      Half-duplex chan.: 9
Volume identifier :
Record blocking   : NEIN    Label standard  : ansi_standard
Number of blocks  : 0       Record density  : 1600_bpi_pe
OLT memory medium : keins   Autom. switch-back: JA
OLT GDS number    : 10
OLT timer value   : 1

Administration Parameters

Chann. status      : AKTIV
Device status      : BETRIEBSBEREIT
Failure status     : HAUPT KANAL
Failure charge meter : 51
```

In the MML Task ANLM, the system features ZGD (Central call charge recording) and GEA (Accumulate call charge units) must be enabled:

```
ANLM<almf:zgd,gea;
ANLM<
```

The Port settings must be changed in the ISM Web browser/Configuration Management/Change Configuration/device (see below):

device										
Zeilen 1 bis 20 von 38 ➡										
deviceName	hostIndex	type	baudRate	parity	bits	stopBits	hwFlowControl	swFlowControl	path	
<input type="checkbox"/> acom1	1	acom	9600	even	7	1	no	yes	/dev/ttyS1	
<input type="checkbox"/> acom2	1	acom	19200	no	8	1	no	yes	/dev/ttyS1	
<input type="checkbox"/> HDD1	1	hd							/etc/pfsp	
<input type="checkbox"/> HDD2	1	hd							/etc/Pfsp	
<input type="checkbox"/> HDD3	1	hd							/log_data	
<input type="checkbox"/> HDD4	1	hd							/other_fd/platform/pfsp	
<input type="checkbox"/> HDD5	1	hd							/var/opt/pfsp/Accounting	
<input type="checkbox"/> HDD6	1	hd							/var/opt/pfsp/S01_Logfile	
<input type="checkbox"/> raw1	1	raw	19200	no	8	1	no	yes	/dev/ttyS1	
<input type="checkbox"/> raw2	1	raw	19200	no	8	1	no	yes	/dev/ttyS1	
<input type="checkbox"/> tco1	1	tco							5801	
<input type="checkbox"/> tco2	1	tco							5802	
<input type="checkbox"/> tco3	1	tco							5801	
<input type="checkbox"/> tco4	1	tco							5802	
<input type="checkbox"/> tco5	1	tco							5801	
<input type="checkbox"/> tco6	1	tco							5802	
<input type="checkbox"/> tco7	1	tco							5801	
<input type="checkbox"/> tco8	1	tco							5802	
<input type="checkbox"/> tty1	1	tty	19200	no	8	1	no	yes	/dev/ttyS1	
<input type="checkbox"/> tty2	1	tty	19200	no	8	1	no	yes	/dev/ttyS1	

[Alle auswählen](#) [Auswahl umkehren](#)

Bearbeite ausgewählte Zeilen

With MML, the settings of the charging data channel and the right format for the charging data interface were changed by means of the task VGDE. The parameters have to be set in a way that the interface requirements for NovaTax are satisfied (see below):

```
PROL<praw:vgde;  
Command processing in proress !  
VGDE<knau:1;  
VGDE<knlo:1;  
VGDE<knae:1,1,geraet;  
VGDE<gddv:ZG-01;  
VGDE<knae:1,2,sqv-gebueh.dat;  
VGDE<knae:1,4,0;  
VGDE<knae:1,6,1;  
VGDE<knae:1,7,0;  
VGDE<knae:1,9,0;  
VGDE<knae:1,15,zgde;  
VGDE<knae:1,16,ja;  
VGDE<knae:1,17,nein;  
VGDE<knae:1,18,nein;  
VGDE<knae:1,24,ja;  
VGDE<knae:1,20,ansi_standard;  
VGDE<knae:1,21,1600_bpi_pe;  
VGDE<exit;  
VGDE<fmau:1;  
VGDE<fmlo:1,alle;  
VGDE<fmae:1,gd_gdv_ltg_rufnr,5,nein,h'20;  
VGDE<fmae:1,gd_ltg_buendel_nr,3,nein,h'20;  
VGDE<fmae:1,gd_su_isdn_number,24,ja,h'20;  
VGDE<fmae:1,gd_ru_isdn_number,24,ja,h'20;  
VGDE<fmae:1,gd_zusatzkennziffern,8,nein,h'20;  
VGDE<fmae:1,gd_gdv_aufbau,3,nein,h'20;  
VGDE<fmae:1,gd_gebuehren,8,nein,h'20;  
VGDE<fmae:1,gd_g_dauer_sekunden,8,nein,h'20;  
VGDE<fmae:1,gd_tag_gespr_dat,2,nein,0;  
VGDE<fmae:1,gd_monat_gespr_dat,2,nein,0;  
VGDE<fmae:1,gd_jahr_gespr_dat,2,nein,0;  
VGDE<fmae:1,gd_std_end_gespr,2,nein,0;  
VGDE<fmae:1,gd_min_end_gespr,2,nein,0;  
VGDE<fmae:1,gd_sek_end_gespr,2,nein,0;  
VGDE<fmae:1,gd_service,10,ja,h'20;  
VGDE<fmae:1,gd_cause_sub_isdn_nb,24,nein,h'20;  
VGDE<fmae:1,gd_amt_kommend,10,ja,h'20;  
VGDE<fmae:1,gd_tan,3,nein,h'20;  
VGDE<fmae:1,gd_schluss,1,ja,h'20;  
VGDE<exit;  
VGDE<knau:1;  
VGDE<knsa:1,ein;  
VGDE<exit;
```

4. Configuration of the NovaTax Server

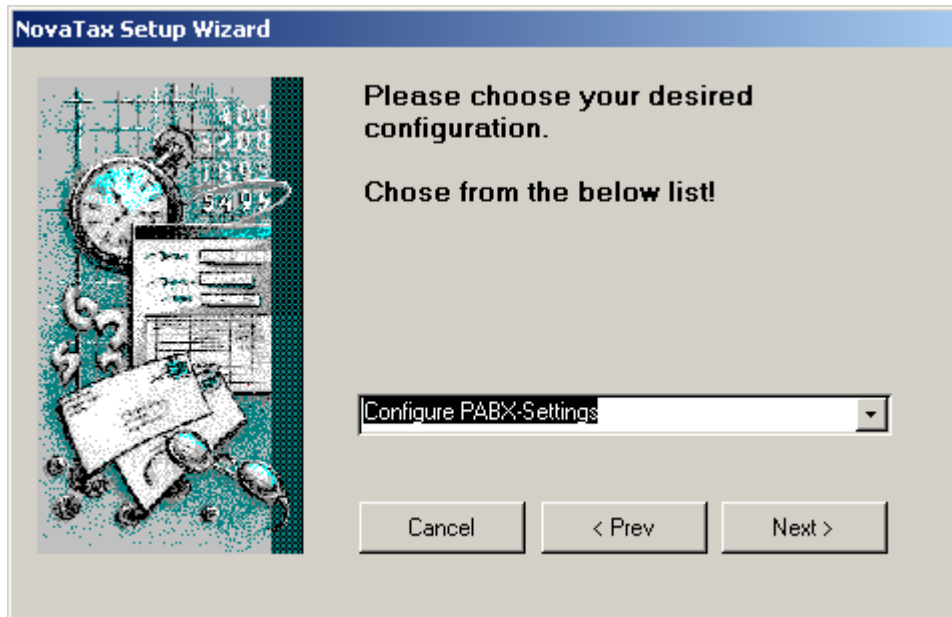
The NovaTax offers the following ways of configuration:

For initial configuration, the NovaTax Setup Wizard is used (as described below).

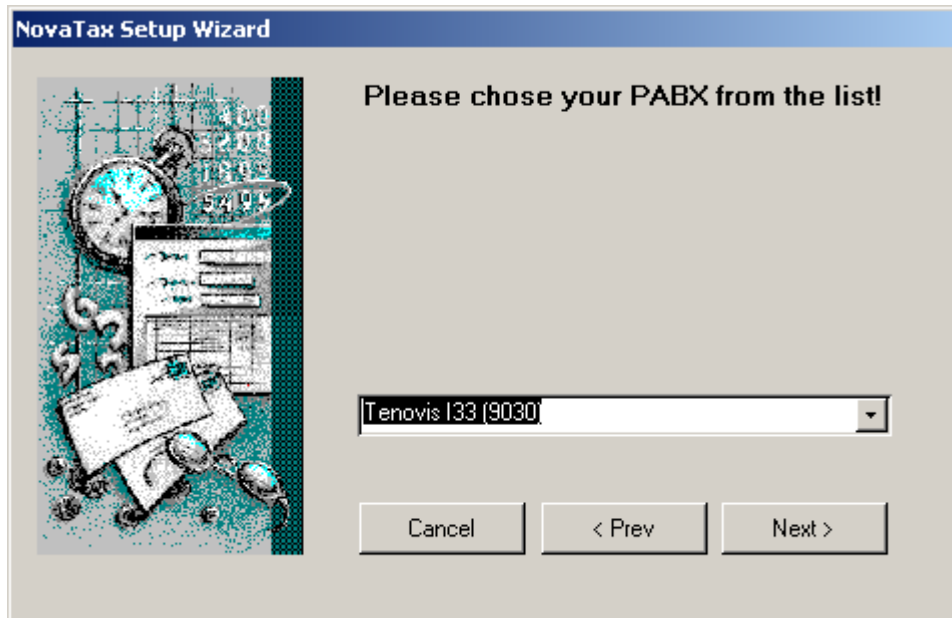
Further configurations or changes can be made by means of a web interface (not described here).

All configurations are saved in the NovaTax.ini file. This file can also be altered by means of a text editor and restored.

Configure the PABX-Settings



Tenovis I33 (9030)



NovaTax Setup Wizard

Please chose your PABX from the list!

Tenovis I33 (9030)

Cancel < Prev Next >

The image shows a screenshot of the 'NovaTax Setup Wizard' window. On the left is a decorative graphic with a clock, a telephone, and some papers. The main text area contains the instruction 'Please chose your PABX from the list!'. Below this is a dropdown menu showing 'Tenovis I33 (9030)'. At the bottom are three buttons: 'Cancel', '< Prev', and 'Next >'.

As connection type choose: Serial connection



NovaTax Setup Wizard

Please enter the connection type for the telephone system.

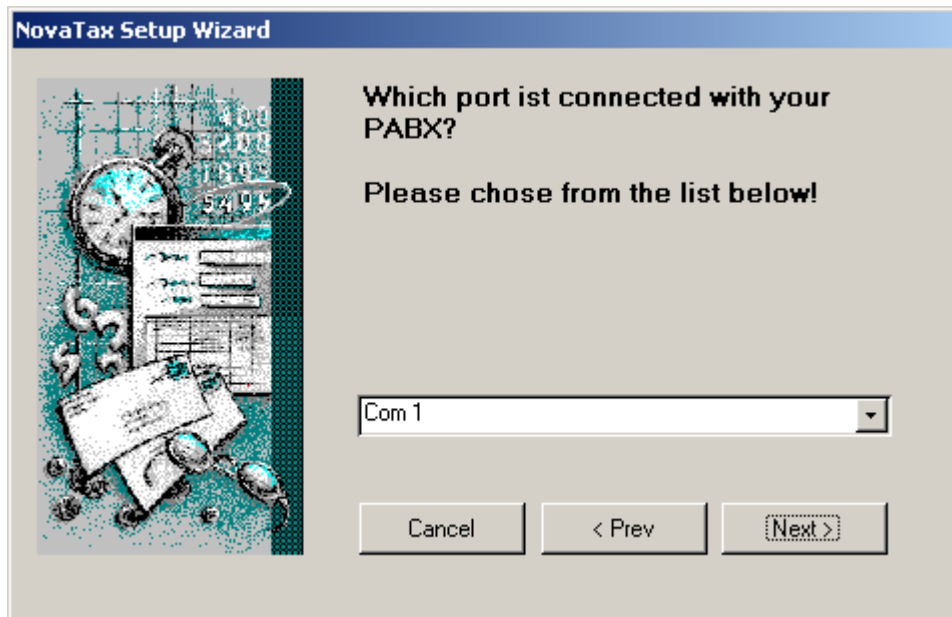
Please choose from the list below!

Serial connection

Cancel < Prev Next >

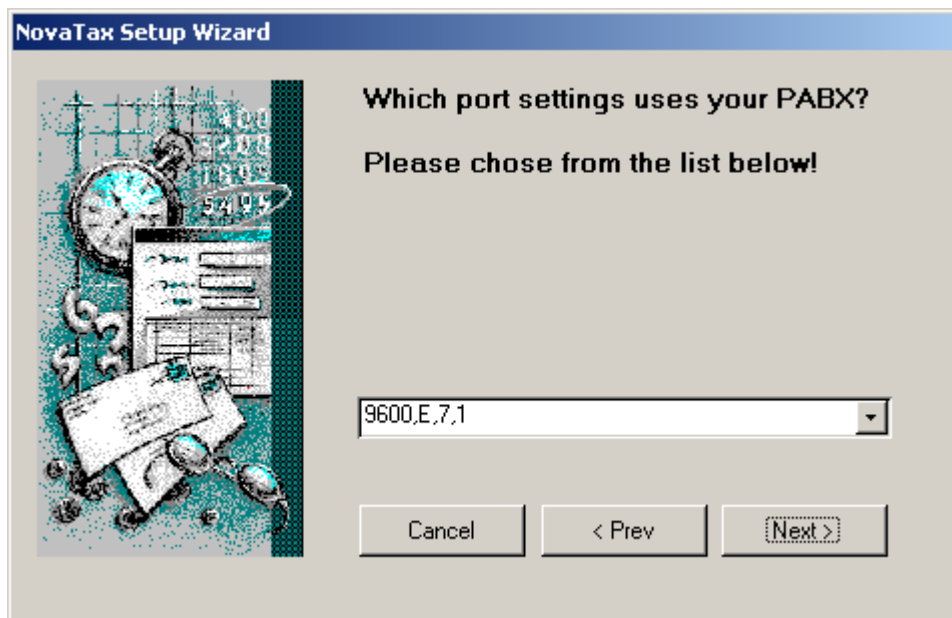
This screenshot shows the next step in the 'NovaTax Setup Wizard'. The instruction is 'Please enter the connection type for the telephone system.' followed by 'Please choose from the list below!'. The dropdown menu now shows 'Serial connection'. The buttons at the bottom are 'Cancel', '< Prev', and 'Next >'.

Choose port: Com 1



The image shows a screenshot of the 'NovaTax Setup Wizard' dialog box. On the left side, there is a decorative graphic featuring a clock, a telephone, and some papers. The main text area on the right asks, 'Which port ist connected with your PABX?' and 'Please chose from the list below!'. Below this text is a dropdown menu that currently displays 'Com 1'. At the bottom of the dialog, there are three buttons: 'Cancel', '< Prev', and 'Next >'.

Choose the port settings which your PABX uses: 9600,E,7,1 (refer to **Section 3.1 Screen 5**)



This image is another screenshot of the 'NovaTax Setup Wizard' dialog box, similar to the one above. It features the same decorative graphic on the left. The main text area asks, 'Which port settings uses your PABX?' and 'Please chose from the list below!'. The dropdown menu now displays '9600,E,7,1'. The buttons at the bottom are 'Cancel', '< Prev', and 'Next >'.

5. Interoperability Compliance Testing

5.1. General Test Approach

Testing included validation of correct operation of the functions as agreed with NovaLink such as:

Normal cases:

- Connection to the PBX (Avaya I55 LX) over V.24 with ACOM protocol
- Receipt of records from outgoing calls - correct listing of parameters
- Receipt of records from incoming calls - correct listing of parameters

Supplementary Services:

- Receipt of records from incoming calls to a busy endpoint - correct listing of parameters
- Receipt of records from incoming calls with no answer - correct listing of parameters
- Receipt of records from diverted calls (ext. - ext.)
- Receipt of records from attendant calls

Recovery treatment

- Reconnect after disconnection of the V.24 cable between NovaTax and Avaya I55 LX
- Power down the NovaTax services, start it again and wait for reconnect
- Power down the Avaya I55 LX, start it again and wait for reconnect

5.2. Test Results

All test cases were executed and passed.

6. Verification Steps

To verify that the solution is properly configured, the following steps can be taken:

After establishing the physical connection between the NovaTax Server and Avaya I55 LX via V.24 with ACOM protocol, the correctness of the output charging data can be checked. This can be checked by making calls to local, external, and stations attached via a trunk, and verify that the content of the invoice generated by NovaTax correctly reflects the actual resource utilization.

7. Support

For technical support for the NovaLink NovaTax solution, please contact the technical support hotline of NovaLink:

- **Phone:** +41 52 762 6677
- **Email:** helpdesk@novalink.ch

8. Conclusion

These Application Notes describe the configuration steps required for NovaLink NovaTax to successfully interoperate with an Avaya Communication Server Integral 55 LX. A Linux based Advanced Computer Board (ACB) with software version L03 was used. Normal test cases (e.g., “Receipt of records from outgoing calls - correct listing of parameters” and “Receipt of records from incoming calls - correct listing of parameters”) were validated. The available supplementary services and the error and recovery treatment of the solution were checked. The configuration described in these Application Notes has been compliance tested successfully.

9. Additional References

Additional product information from Avaya:

Avaya I55 LX:

<http://support.avaya.com/japple/css/japple?PAGE=Product&temp.productID=304366>

Additional product information from NovaLink:

<http://www.novalink.ch/index.php?id=49>

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