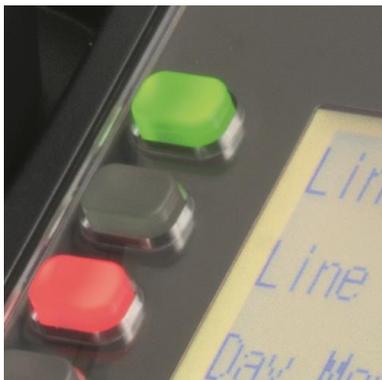


The SL2100 Quick Install Guide: SLNet

Out of the
box
installations
for resellers



This guide explains the installation, configuration and operation of SLNet for the SL2100 Telephone System including the exchange line and telephone connections.

Further information is available on BusinessNet.

Please keep all information supplied for future reference.

Regulatory Notice.

Refer to the Declaration of Conformity shown in the SL2100 Hardware Manual

Warning: This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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What is the SL2100?

The SL2100 system consists of a chassis unit with a dedicated slot for the CPU card and four universal slots for interface cards. Each universal slot supports an extension interface card, optionally each extension interface card can have a trunk interface daughter card mounted.

The chassis unit is ventilation cooled (no fan) and can be wall mounted or rack mounted with the optional rack mount shelf.

Up to three chassis units can be connected together to provide a total of twelve universal slots.

Interface cards are available for Analogue and ISDN trunks, proprietary SL2100 terminals and analogue telephones.

SIP Trunks, SLNet and IP terminals are supported without the need for additional system hardware as eight VoIP resources are built in to the CPU card. VoIP resources can be expanded to 16 by adding the optional VOIPDB card and further to 128 with licenses.

InMail voicemail is also available either using the built in storage of the CPU-C1-A or by adding the optional SD card.

The built in InMail with the CPU-C1-A card provides 4channels and 2hours of storage, this can be expanded to 15hour or 120hour by adding the SD card to the CPU.

The CPU-C1 requires the SD card installed to provide InMail voicemail.

Both CPU's have built in VRS with 4 channels and 100 messages with 2hours message storage.



All equipment will operate in the default/factory setting when the SL2100 is installed.

With the default settings:

- Each telephone will function and is assigned an extension number.
- Calls received on the trunk lines will ring at telephone number 200.
- Each telephone can make outside calls by dialling 9.
- Each trunk line is presented at a Function Key with busy lamp indication.
- SLNet is not configured

SLNet included in this guide

Only the configuration of SLNet is covered in this guide.

SLNet provides these networking features:

- Centralised InMail voicemail
- Desk to Desk calling with Caller ID and name display
- Sharing trunk lines with remote systems
- Extension busy lamp information
- Shared Park Hold orbits

SLNet is available for SL2100 systems only, each system should have the same level of Main Software installed. SLNet is supported with Main Software R1.5 or later.

Parts available for the SL2100

Not all parts are included within this guide, please refer to the other SL2100 Quick Install Guides or the SL2100 Hardware Manual for a full description and installation instructions of all parts available.

IP7WW-4KSU-C1	SL2100 Chassis unit	Included within this guide
IP7EU-CPU-C1	SL2100 CPU card	
IP7EU-CPU-C1-A	SL2100 CPU card with pre-installed IP licenses and 2hour InMail	
IP7WW-VOIPDB-C1	VOIP card	
SL2100 ASPIRENET-01 Lic	SLNET channel license (1ch)	
SL2100 IP Channel-16 Lic	VIP channel license (16 ch)	
IP7WW-EXIFB-C1	Expansion interface card	Interface card required to connect to the expansion chassis
IP7WW-EXIFE-C1	Expansion interface card	Interface card installed into the expansion chassis
IP7WW-SDVMS-C1 IP7WW-SDVML-C1	InMail voicemail	Provides 15/120 hour voicemail
IP7WW-3COIDB-C1	Analogue trunk daughter card	3 analogue trunks, max. 4 per unit
IP7WW-2BRIDB-C1	2BRI card	2 x BRI circuits, 4 trunks
IP7WW-1PRIDB-C1	ISDN PRI card	1 PRI circuit, up to 30 trunks
IP7WW-000U-C1	Trunk carrier card	Require when 082E or 008E card is not available to install the 2BRIDB,1PRIDB or 3COIDB card
IP7WW-082U-B1	8 Digital Extension (2wire) and 2 SLT extension card	8 digital and 2 SLT extension interfaces, max 3 per unit
IP7WW-308U-A1	8 Hybrid Extension (4wire) extension card	8 hybrid extension interfaces, max 4 per unit
IP7WW-008U-C1	8 Analogue extension card	8 analogue extension interfaces, max 4 per unit
IP4WW-Battery Box	Battery box	External battery box for power fail backup (batteries not included)
161893001-A	Rack mount shelf	Rack mount for SL2100 chassis unit

Refer to Prophix for all parts and licenses available in your region.

SL2100 Terminals are included in separate Quick Install Guides

SLNet Overview

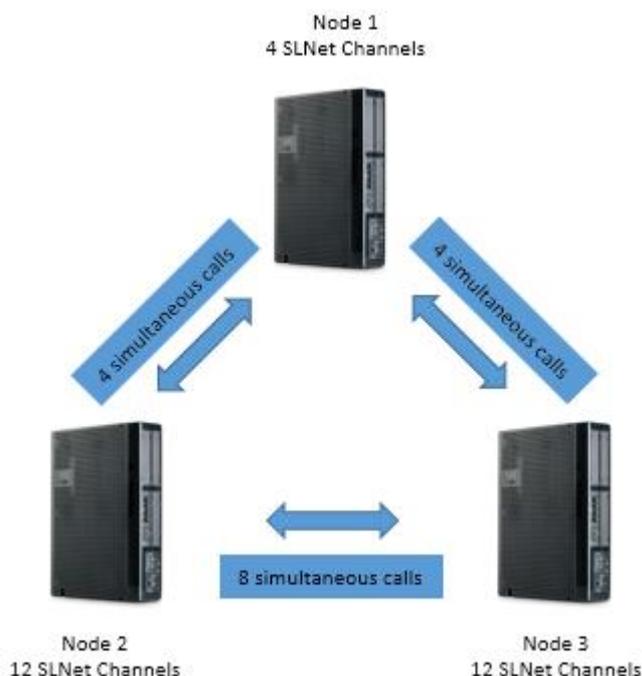
SLNet allows for networking between up to 50 SL2100 systems. Interconnected with VOIP, each phone system becomes a node on the network that can communicate with any other phone system node. Systems can be installed separately in the same building, or in remote locations connected via a suitable network.

SL2100 SLNet Channel Capacity

The capacity of SLNet channels is not limited by the quantity of IP or TDM ports installed. The SL2100 supports up to 128 SLNet channels per network node (licenses required for each node).

Each SL2100 system within the SLNet Network must have sufficient SLNet channel licenses BE116748 installed to provide the quantity of simultaneous voice calls required by the customer.

Each SL2100 system will also require sufficient VOIP resources to support the simultaneous calls.



SLNet Numbering Plan

The numbering plan must be unique for all nodes within the SLNet Network, each node must have a unique extension number range, this is defined by the leading two digits unless you intend to use F-Route. F-Route can be used to create a numbering plan that can use any number length to define the remote extension numbers

SL2100 VOIP Resource Capacity

The SL2100 CPU cards have 8 VOIP resources built in, these can be expanded further by adding the VOIPDB card (BE116500) and VOIP channel licenses (BE116744).

Adding the VOIPDB card provides 16 VOIP resources, the VOIP channel license provides an additional 16 resources up to 128 channels maximum.

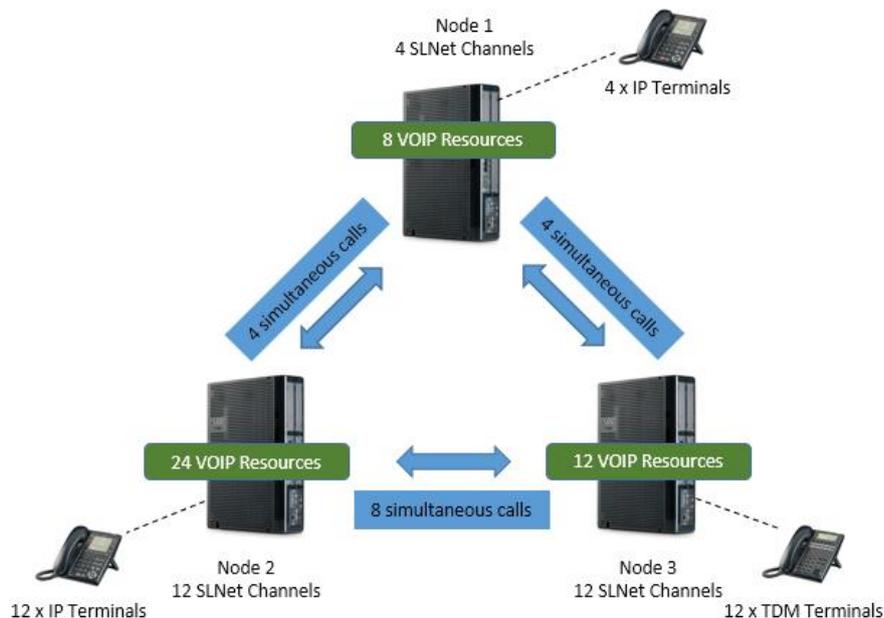
Note - The VOIPDB card must be installed in order to use the VOIP channel license.

	CPU Only 	CPU with VOIPDB 	CPU with VOIPDB + 1 x VOIP channel lic 	CPU with VOIPDB + 2 x VOIP channel lic 	➔	CPU with VOIPDB + 7 x VOIP channel lic 
VOIP Channels SRTP / Non-SRTP	8 ch	16 ch	32 ch	48 ch	➔	128 ch

The quantity of VoIP resources required is determined by the end-point type: IP or TDM, as shown below.

	Quantity of VOIP resources required			
	SLNet channel	SIP Trunk	Digital/Analog/Hybrid Terminal	IP Terminal
SLNet channel	2	2	1	2

This example shows the minimum quantity of VOIP resources for each SL2100 system if the customer requires the maximum quantity of simultaneous SLNet calls to be available between each node. No trunk channels are included in the example.



SL2100 Configuration

Currently only PCPro supports the setup of SLNet configuration items, System Phone or WebPro does not support SLNet items.

Network Requirements

SLNet should be deployed on networks connected by some form of Point-to-Point connection such as a VPN, MPLS, or other Point-to-Point circuit.

The voice quality of VoIP depends on variables such as available bandwidth, network latency, and quality of service initiatives (QoS), all of which are controlled by the network and internet service providers. Because these variables are not within NEC's control, the performance of the user's IP based voice solution cannot be guaranteed. Therefore, NEC recommends connecting the VoIP equipment through a fully managed data network with Quality of Service (QoS) implemented. For a network to be suitable for VoIP it must pass specific requirements.

The requirements are:

- One way delay must not exceed 150 ms
- Round trip delay must not exceed 300 ms
- Packet loss must not exceed 1 %
- Data switches must be manageable
- No half-duplex equipment may be present in the network
- Routers must provide QOS

Depending upon how the QOS policies are built in the network, assignments may be needed in the CPU (PRG 84-10).

- Adequate bandwidth for the estimated VoIP traffic must be available

See below chart for bandwidth calculations.

Below is a chart that shows the average bandwidth per VoIP call over Ethernet

Codec	Packet size	Bandwidth used	Codec	Packet size	Bandwidth used
G.711	10 mS	110.4 kbps	G.729	10 mS	54.4 kbps
G.711	20 mS	87.2 kbps	G.729	20 mS	31.2 kbps
G.711	30 mS	79.5 kbps	G.729	30 mS	23.5 kbps
G.711	40 mS	75.6 kbps	G.729	40 mS	19.6 kbps
G.722	10 mS	110.4 kbps	G.729	50 mS	17.3 kbps
G.722	20 mS	87.2 kbps	G.729	60 mS	15.7 kbps
G.722	30 mS	79.5 kbps	G.723	30 mS	20.8 kbps
G.722	40 mS	75.6 kbps	G.723	60 mS	13.2 kbps

As an example, if one site plans on making a maximum of 16 calls across the network using G.729 with a 30 ms packet size, there must be a minimum of 376 kbps available for voice traffic. The QOS policy for this network should allow for 376 kbps to be set aside for voice prioritization.

Conditions

1. SLNet is not supported through NAT, only Point-to-Point connection such as a VPN, MPLS, or other Point-to-Point circuit.
2. SLNet is only for networking SL2100 systems together.
3. Hold, Transfer, and Park recall timers will follow the timer of the system where the call is on hold (Trunk and Station). For example, a user in Site A calls a user in Site B. Site B answers the call and places the call on hold. The hold recall time is based on Site A because the call on hold is in Site A and not site B.
4. The allowing or denying of Class of Service features in an SLNet Network must be performed network wide. For example, if users in Class of Service 1 at site 1 want to block the Camp On feature a change will have to be made in Class of Service 1 of all systems in the network.
5. When a terminal or trunk is placed on hold, the Music on Hold comes from the system where the terminal or trunk resides.
6. When Multiple Voice Mails are installed in the network, each site must have a unique Voice Mail pilot number. The pilot number assigned must be within the routable extension number range in all sites throughout the network.
7. When each site has its own Voice Mail system, a user in one location cannot call the Voice Mail pilot number that resides in another system.
8. When each site has its own Voice Mail system, a Voice Mail Message Line key (Program 15-07 : key 77) cannot be programmed for an extension in a Remote system.
9. Virtual Loopback trunks are not supported across SLNet
10. SMDR information is collected in the system where the trunk resides. If a user in Site A accesses a CO trunk out of Site B, this call is reported in Site B's SMDR and not in Site A's SMDR.
11. When a networked internal call forwards to Voice Mail (Centralized or Individual Voice Mail) the user will not be able to perform any dialing options to dial out of the mailbox. The associated dial action table cannot be accessed unless the call originates from a CO trunk
12. Built-in Automated Attendant and Centralized Voice Mail cannot be used in the same system
13. Calls (Intercom or Trunk) routed across the SLNet network cannot be answered by the Built-In Automated Attendant
14. Directory Dialing will not list extension numbers in remote SLNet systems
15. An operator extension (Program 20-17) cannot be assigned to an extension in a Remote SLNet system. The operator for each site must reside in their own local system
16. Mobile Extension is not supported for calls across the SLNet network
17. When transferring a caller to a remote SLNet extension via the press of a DSS key on a 60 button DSS console, without pressing Transfer first, you must press the DSS key twice to complete the transfer.

1- Unpack the SL2100 System

SL2100 Chassis unit

- 1 x SL2100 system
- 1 x Wall mounting template
- 1 x Power cord (selected regions)
- 4 x Fixing screws (M4.1 x 25mm)

SL2100 CPU card

- 1 x CPU card
- 1 x Lithium battery (CR2032)

SL2100 VOIPDB Card (optional)

- 1 x VOIPDB card
- 4 x Screw & washer

Additional Items Required:

- Cross head screwdriver.
- Utility knife or small cutters to remove the plastic knockouts
- 4 Wall fixing plugs suitable for the type of wall.
- Solid wire for extending telephone cabling:
 - Recommended cable type: Twisted pair (CW1308 or similar specification)
 - Conductor diameter: 0.4 to 0.6 mm
 - Maximum cable length: (with 0.5 mm diameter cable)
 - SL2100 system telephone – 300 metres
 - Normal telephone (SLT) – 1125 metres

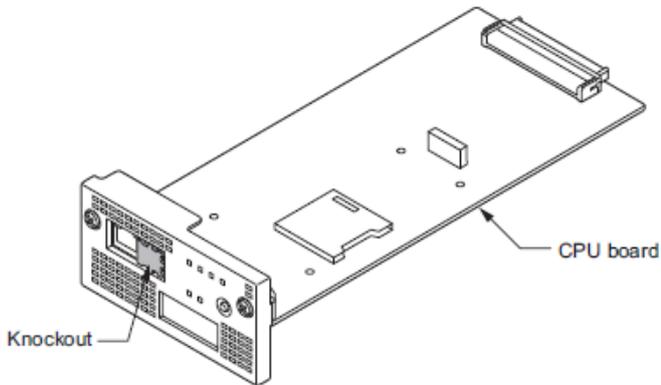
Requirements for SLNet:

- A static IP address is required on the WAN interface – This is usually a chargeable extra on business internet connections
- You will need administrative access to the WAN router/modem/firewall device. NEC will not provide support in configuration of this device

2- Install the VOIPDB card (Optional)

The VOIPDB card is optional and is only required when more than the 8 VOIP resources built into the CPU card are required.

Remove the plastic knockout from the front panel of the CPU card.



Install the VOIPDB card to connector J2 on the CPU card and tighten the 4 screws

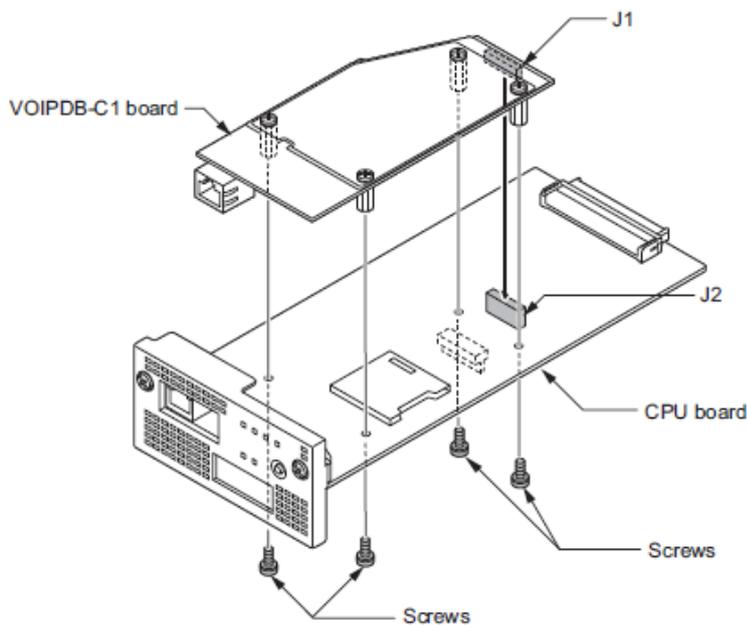
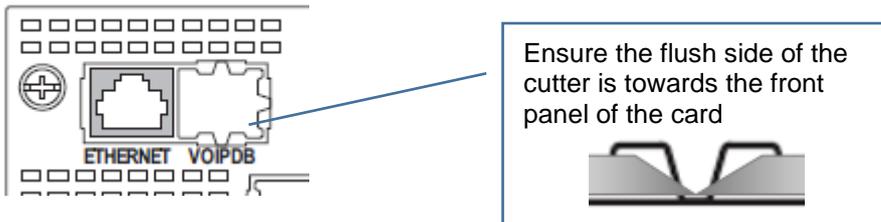
Removing the Plastic Knockouts

Card knockouts

Use small cutters with a flush cutting jaw, ensure the flush side of the cutter is towards the front panel of the card.

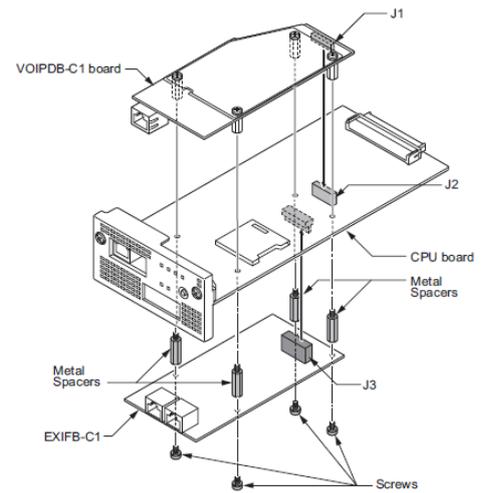
Cut the three connection points for the knockout

Remove any sharp edges with a utility knife

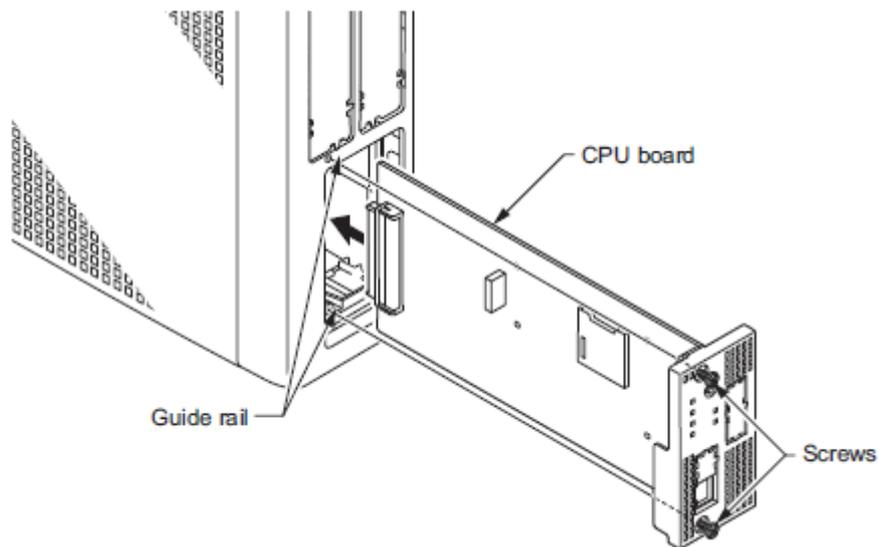


Install the CPU Card

Note – If you are also installing the EXIFB card the 4 screws are replaced by the 4 metal spacers supplied with the EXIFB card.



Insert the CPU card mounted into the SL2100 CPU slot S0, ensure the card slides into the guide rails and tighten the two screws to secure the card.



3- SLNet Configuration

The SL2100 includes on-board DSP resources for connection to VoIP service providers. There are 8 x VoIP resources on board the CPU. It is possible to increase this to a maximum of 128 by adding the VOIPDB hardware and licenses.

This table shows the quantity of resources required for common call scenarios.

<u>Quantity of DSP resources required</u>				
	SIP Trunk	Digital/Analog/Hybrid Phone	VoIP Phone	SLNet channel
SIP Trunk	2	1	2	2
Digital/Analog/Hybrid Phone	1	0	1	1
VoIP Phone	2	1	0	2
SLNet Channel	2	1	2	2

SLNet Licenses

The SL2100 requires licenses BE116748 for SLNet channel availability.

Refer to the licensing manual for further information on licenses and the LMS (NEC's License Server).

Configuration Procedure

Before starting you will need to know the following information:

The LAN settings to configure the SL2100 to join the customers network or voice LAN. The SL2100 will require two IP addresses in the customers network

- IP Address & Subnet Mask
- IP Address for VoIP media resource
- Default Gateway IP address

The remote node addresses;

- IP addresses of each remote SLNet node

Network Numbering Plan

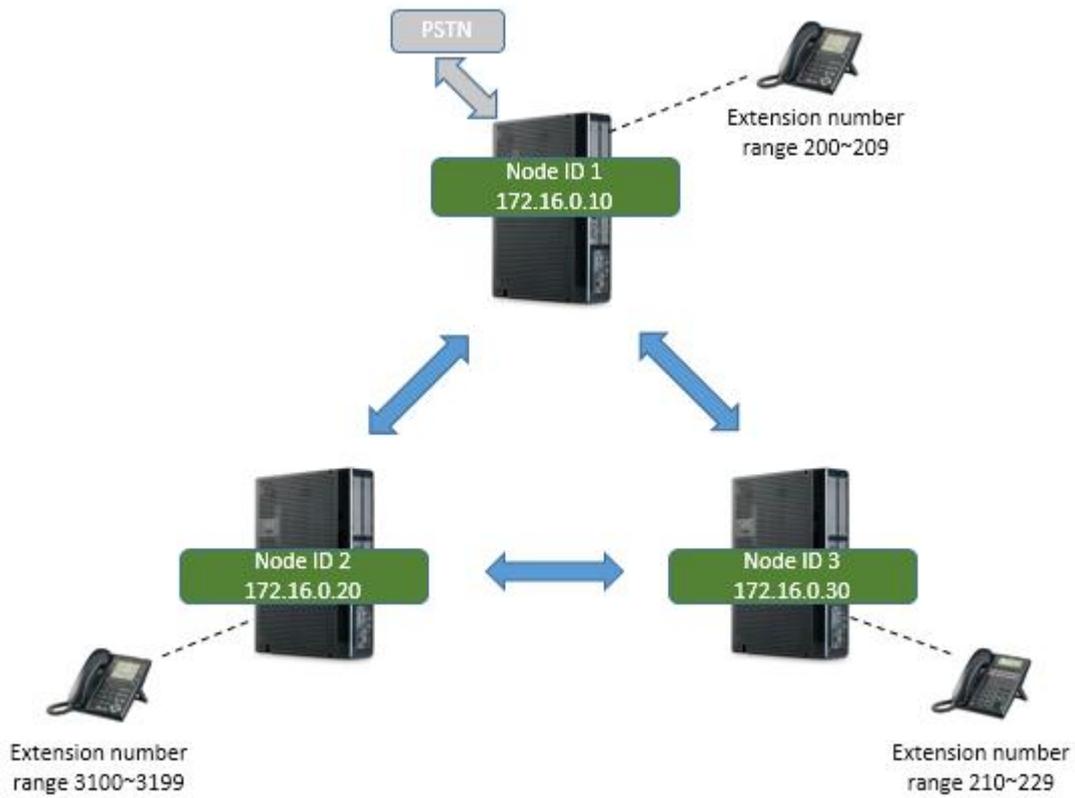
- The complete numbering plan for all SLNet nodes & will F-Route be used
- Trunk access/routes, if using trunks at remote nodes

Centralised Voicemail

- The voicemail Pilot number must be within the SLNet Numbering Plan

SLNet Network Plan

Plan your SLNet Network before stating the system configuration, use the example below.



Node ID 1~50	IP Address	Extension number range	Centralised Voice Mail Pilot number	Trunk Route Access (Route number)
1	172.16.0.10	200~209	-	2
2	172.16.0.20	3100~3200	599	-
3	172.16.0.30	210~229	-	-
4				
5				
6				
etc				

The Remote Node selection for call routing is summarised below:

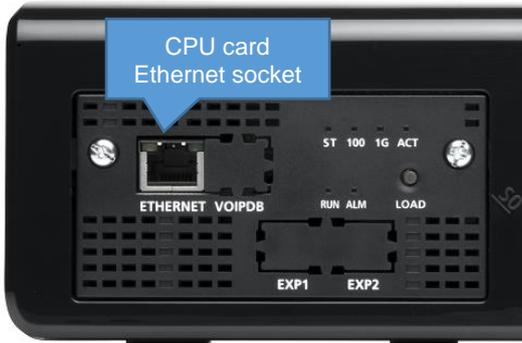
1. User at Node ID 1 dials extension number 3104
2. The numbering plan at Node ID 1 defines the number dialled as SLNet remote Node ID 2
3. Node ID 2 is reached using IP Address 172.16.0.20
4. At Node ID 2 the numbering plan defines the destination as a local extension number

Ethernet sockets for VOIP

There are two Ethernet sockets available with the SL2100: CPU card and optional VOIPDB card. The IP Address of either socket use the same setup for VOIP settings.

Only CPU card installed

- When the CPU card is installed – Use the Ethernet socket of the CPU. 8 VOIP resources built in with the CPU card are available. Use the VOIP IP address settings for VOIP devices. *Note – do not use the CPU IP address settings as these will not support VOIP devices*



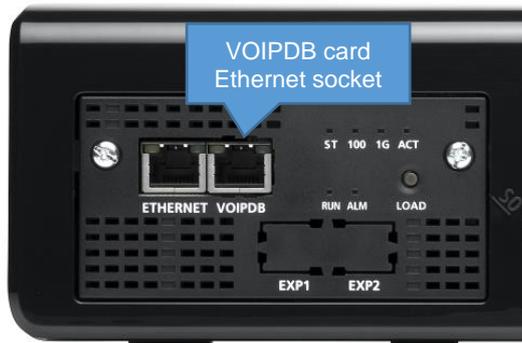
SL2100 IP address	172.16.0.10
Subnet Mask	255.255.0.0
Supports	Data (eg PCPro/WebPro, SMDR etc) VOIP
LAN speed	100 Mbps Full Duplex

Use the IP address and Subnet mask setup in PCPro Easy Edit - **Quick Install + Cards + CPU Settings + CPU IP Address**

IP Address	192.168.0.10
Default Gateway	0.0.0.0
Subnet Mask	255.255.255.0
NAPT Router IP Address	0.0.0.0
▶ VOIP IP Address	172.16.0.10
VOIP Subnet Mask	255.255.0.0

CPU card with VOIPDB daughter card installed

- When the optional VOIPDB card is installed – Use the Ethernet socket of the VOIPDB card. 16~128 VOIP resources provided by the VOIPDB card + VOIP channel licenses are available. Use the VOIP IP address settings for VOIP devices



SL2100 IP address	172.16.0.10
Subnet Mask	255.255.0.0
Supports	Data (eg PCPro/WebPro, SMDR etc) VOIP
LAN speed	100/1000 Mbps Full Duplex

Use the IP address and Subnet mask setup in PCPro Easy Edit - **Quick Install + Cards + CPU Settings + CPU IP Address**

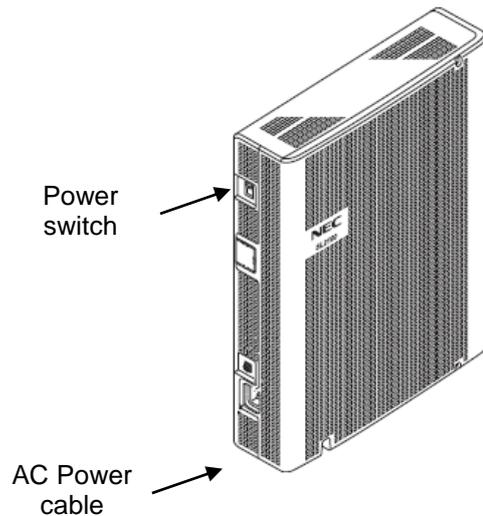
IP Address	192.168.0.10
Default Gateway	0.0.0.0
Subnet Mask	255.255.255.0
NAPT Router IP Address	0.0.0.0
▶ VOIP IP Address	172.16.0.10
VOIP Subnet Mask	255.255.0.0

4- Connect the Power & System Start Up

The power cable is plugged into the left side (wall mounted) or rear (when rack mounted) of the unit via an IEC-C13 connector.

Before connecting the power:

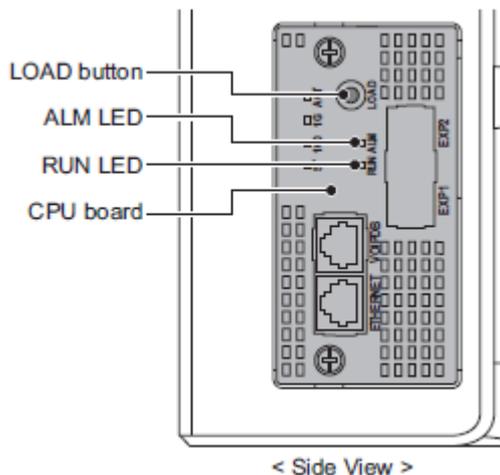
- Ensure the power switch is OFF
- Ensure the power is switched off at the source
- All cards are installed and secured correctly



System Start Up – First Time

! The first time you start up the SL2100 it is important to clear the system memory. This will ensure that the system is set to the default/factory configuration.

1. Push and hold the LOAD Button located on the front of the CPU card.



Also referred to as '**COLD Start**' can also be used at any time to delete the customer's configuration.
Warning – COLD Start should only be used when you want to delete the customer's configuration from the SL2100 CPU card.

2. Turn the power switch on
3. Continue holding the LOAD Button for approximately 10 seconds or until the ALM lamp on the CPU card lights.
4. Release the LOAD Button
5. When the system has completed reloading the system software (about one minute) the RUN LED is flashing green on the CPU card and the system phones will display the Time and Date.

Switching the SL2100 OFF

! Be sure that no calls are in progress otherwise they will be cut off.

Turn the power switch OFF at the SL2100 chassis.

System Start Up – Retain Customer Configuration

This is the normal operation for powering the SL2100 on.

Turn the power switch ON at the SL2100 chassis

5- Configure the SL2100

This Quick Install guide will cover SLNet configuration. For other system configuration please refer to the relevant SL2100 Quick Install Guide.

You must have SL2100 PCPro installed to your laptop/PC, this can be downloaded from BusinessNet, refer to the Quick Install Guide – SL2100 PCpro.

Note - SLNet can only be configured via SL2100 PCPro, System phone or WebPro interface is not currently available for SLNet items.

Before you configure your system it is important that you:

- Have a diagram of your SLNet nodes and the exchange lines and telephones at each node.
- The IP addresses and numbering plan of each node (extension numbering must be unique at each node)
- Plan your requirements before you start.

While you configure your system it is advised that you:

- Make a record of your configuration as you make each change.
- Make small changes, upload to the SL2100 and test the changes. Avoid making all your changes at once as this can make testing more difficult.

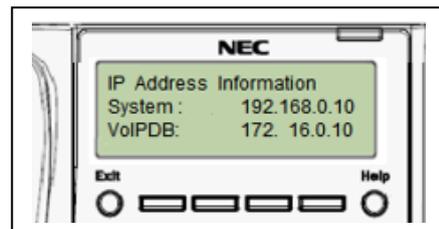
With the default/factory settings:

- SLNet is not configured

Connecting PCPro to the SL2100

Connection default IP Address:
172.16.0.10 / 255.255.0.0

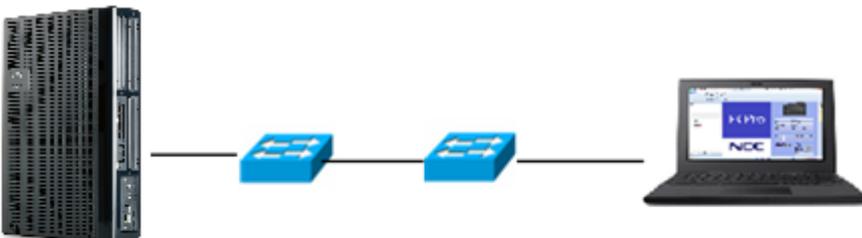
You can check the IP address at any SL2100 system phone:
Press the centre Navigation Key and dial 841



Direct to Ethernet connector on the SL2100 CPU card.



Via the customer's LAN.



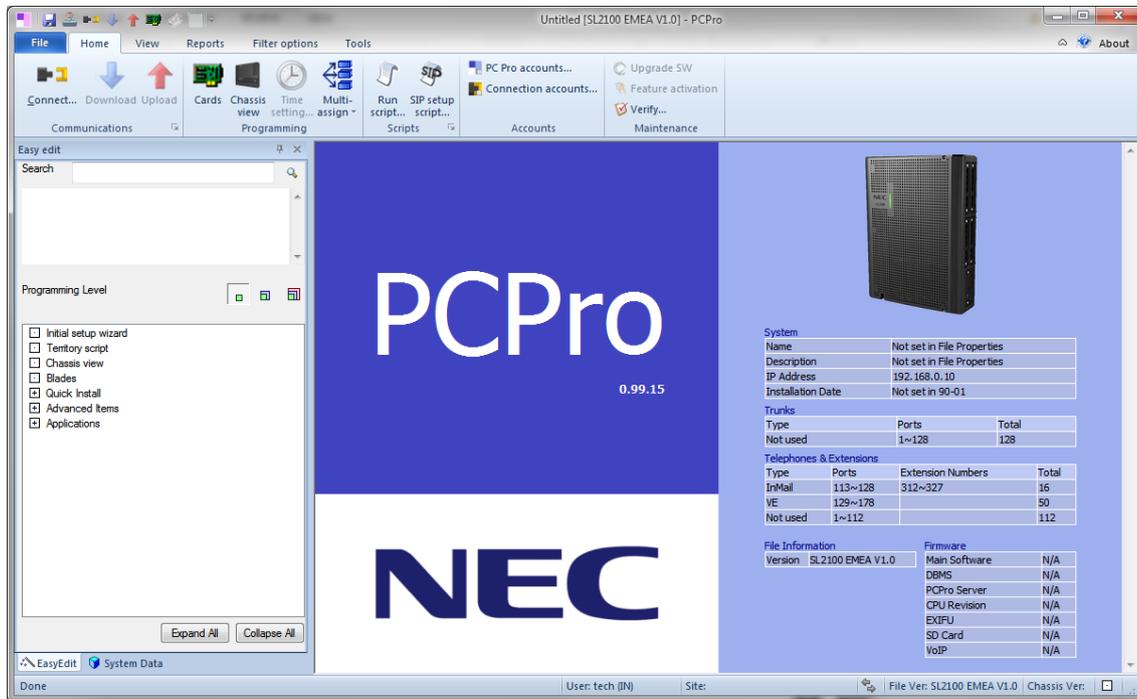
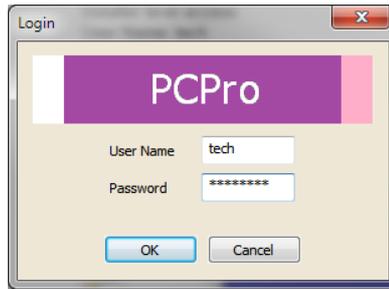
Configure the SL2100

SL2100 PCPro

Installer level access:

User Name: tech

Password: 12345678



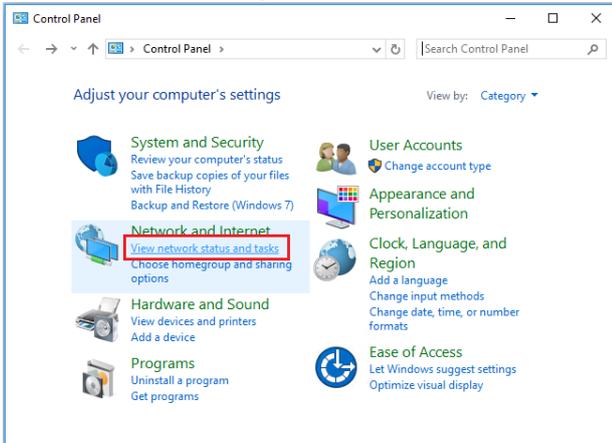
On first install you may need to setup the default sliding panes if you wish to use these. Select **View** tab and click **Default**



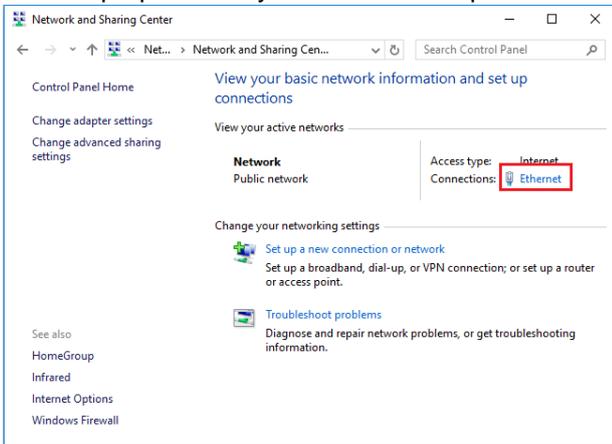
Change your PC IP Address

You will need to reconfigure your PC to have an IP address in the same subnet as the SL2100 during system commissioning. You will be able to change the IP address of the SL2100 during this process.

Your IP Address is adjusted in Windows Control Panel, select 'View network status and tasks'

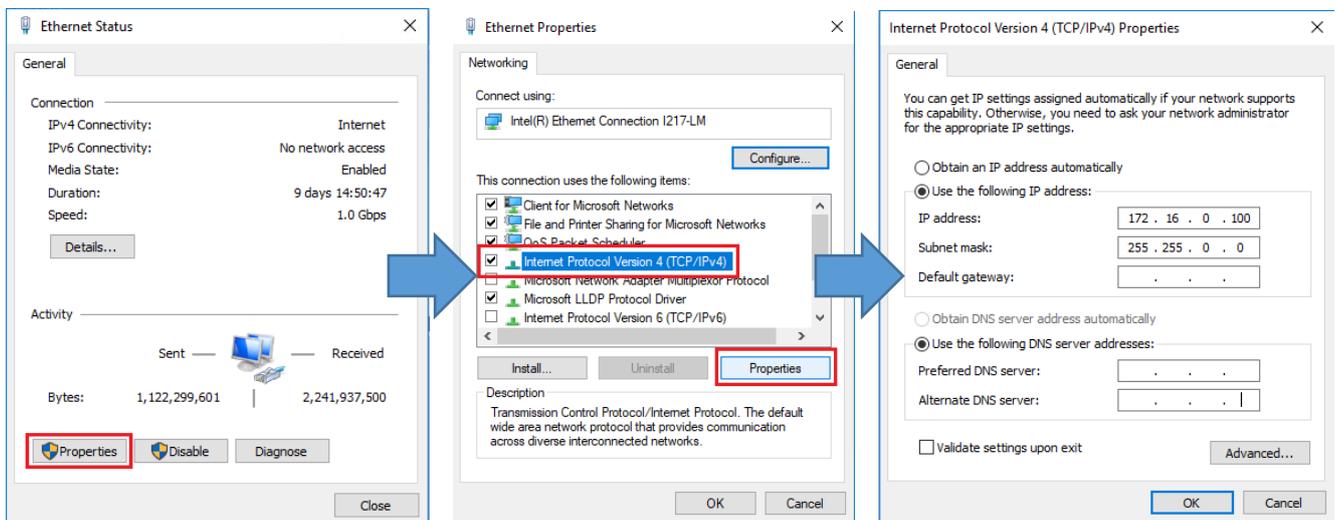


Edit the properties of your Ethernet adaptor



You will need to define an IP address in the same network as the SL2100. Recommended values are 172.16.0.100 / 255.255.0.0

Gateway and DNS addresses are not necessary. Once commissioning of the SL2100 is completed you can return to this area and reconfigure your network adaptor to the previous values.



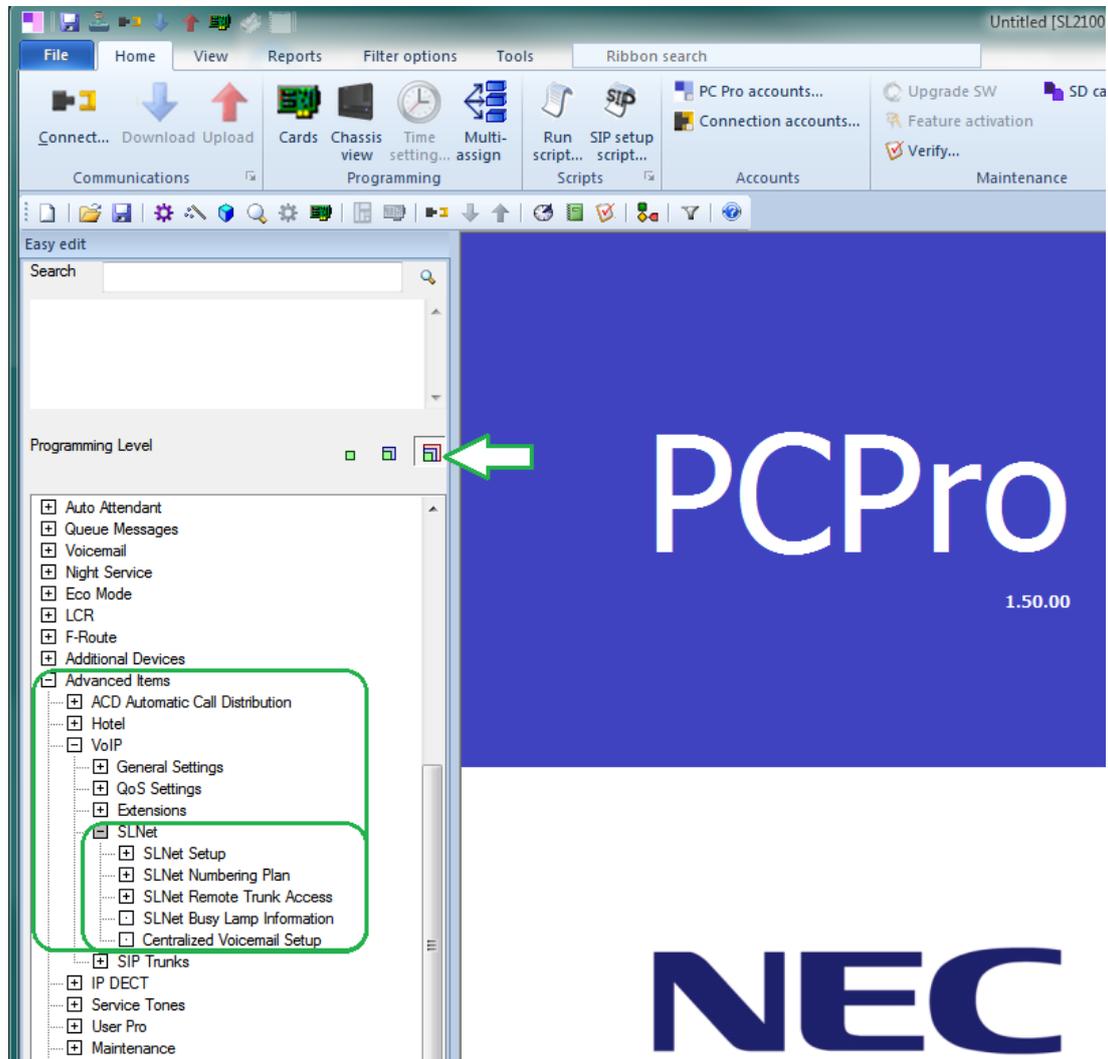
Configure the SL2100

PCPro Initial Setup Wizard

Provides the basic setup for a newly installed SL2100.

SLNet is not included within the Initial Setup Wizard, use Easy Edit to configure SLNet.

Select Advanced level view then **Advanced Items + VoIP + SLNet**



SLNet Setup

- [-] SLNet
 - [-] SLNet Setup
 - SLNet Setup
 - SLNet VoIP Resource IP Address
 - SLNet Address for Remote
 - SLNet CODEC Settings
 - SLNet DTMF Settings
 - [+] SLNet Numbering Plan
 - [+] SLNet Remote Trunk Access
 - SLNet Busy Lamp Information
 - Centralized Voicemail Setup

VOIP IP Address	172.16.0.10
VOIP Subnet Mask	255.255.0.0
Default Gateway	0.0.0.0
Networking System	30000
Fast Start Mode	<input checked="" type="checkbox"/>

VoIP IP address used for Networking System ID

Default Gateway IP address

Enable Fast Start Mode

TCP Port number for SLNet, leave this set to 30000

SLNet VoIP Media Resource IP Address

- [-] SLNet
 - [-] SLNet Setup
 - SLNet Setup
 - SLNet VoIP Resource IP Address
 - SLNet Address for Remote
 - SLNet CODEC Settings
 - SLNet DTMF Settings
 - [+] SLNet Numbering Plan
 - [+] SLNet Remote Trunk Access
 - SLNet Busy Lamp Information
 - Centralized Voicemail Setup

Slot		
000	VOIPDB DSP IP Address	172.16.0.20
000	RTP Port	10020
000	RTCP Port	10021

VoIP resource IP address for media (RTP)

RTP & RTCP port numbers can be left at default values

Slot 000 refers to the CPU card / VOIPDB card

SLNet Address for Remote Nodes

Use your SLNet Network plan to define a Node ID number 1~50 to each node.

- SLNet
 - SLNet Setup
 - SLNet Setup
 - SLNet VoIP Resource IP Address
 - SLNet Address for Remote
 - SLNet CODEC Settings
 - SLNet DTMF Settings
 - SLNet Numbering Plan
 - System Numbering
 - Extension Numbers
 - F-Route
 - SLNet Remote Trunk Access
 - SLNet Busy Lamp Information
 - Centralized Voicemail Setup

Networking System ID	IP Address
01	0.0.0.0
02	0.0.0.0
03	0.0.0.0
04	0.0.0.0
05	0.0.0.0
06	0.0.0.0
07	0.0.0.0
08	0.0.0.0
09	0.0.0.0
10	0.0.0.0
11	0.0.0.0
12	0.0.0.0
13	0.0.0.0
14	0.0.0.0

Remote nodes 1~50

IP Address of each remote node. Must be in line with the Network plan for routing calls to the correct node

Note: Do not enter the local SL2100 systems IP Address in this table, it is only used for the remote systems it will be connected to.

SLNet CODEC Settings

Adjust the Codec settings for SLNet.

Select the CODEC type:
G.711
G.729
G.722

Audio Capability Priority	G.711_PT
G.711 Maximum Audio Frame Size	30ms
G.711 Voice Activity Detection	<input type="checkbox"/>
G.711 Type	A-law
G.711 Minimum Jitter Buffer Size	30
G.711 Average Jitter Buffer Size	60
G.711 Maximum Jitter Buffer Size	120
G.729 Maximum Audio Frame Size	30ms
G.729 Voice Activity Detection	<input type="checkbox"/>
G.729 Minimum Jitter Buffer Size	30
G.729 Average Jitter Buffer Size	60
G.729 Maximum Jitter Buffer Size	120
Jitter Buffer Mode	Self adjusting
Voice Activity Detection Threshold	20
G.722 Maximum Audio Frame Size	30ms
G.722 Minimum Jitter Buffer Size	30
G.722 Average Jitter Buffer Size	60
G.722 Maximum Jitter Buffer Size	120
RTP Filter	Enable

DTMF Relay Mode

Use Profile 1 to select the operation of DTMF digit sending for SLNet calls.

Select the option for Profile 1 for SLNet
Profiles 2~6 are not used for SLNet calls

		Profile 1	Profile 2	Profile 3	Profile 4	Profile 5	Profile 6
Networking	DTMF Relay Mode	Disable	Disable	Disable	Disable	Disable	Disable
Networking	DTMF Payload Number	110	110	110	110	110	110

SLNet Numbering Plan – System Numbering

Use your SLNet Network plan to enter the remote extension numbering of all SLNet remote Nodes.

Remote extension numbers are set as Type: Networking System Access and the SLNet Networking Node ID 1~50 is entered.

Local extension numbers are set as Type: Extension Access. The Networking ID number is not required for local numbers and should be set to 0.

Note – it is not possible to duplicate extension numbers at remote sites, each site must have a unique extension number range.

The screenshot shows the SLNet configuration interface. On the left is a tree view with the following items: SLNet (expanded), SLNet Setup, SLNet Numbering Plan (expanded), System Numbering (expanded), Extension Numbers, F-Route, SLNet Remote Trunk Access, SLNet Busy Lamp Information, and Centralized Voicemail Setup. On the right is a table with the following columns: 1st Dial Digit, 1st and 2nd Dial Digits, Dial Digit Length, Type, and Networking ID. The table is divided into sections: 'Type: Extension access' with rows (1, 1x, 3, Extension access, 0), (2, 20, 3, Extension access, 0), (4, 4x, 3, Extension access, 0), and (6, 6x, 3, Extension access, 0); 'Type: Networking System Access' with rows (2, 21, 3, Networking System Access, 3), (2, 22, 3, Networking System Access, 3), (3, 3x, 4, Networking System Access, 2), and (5, 5x, 3, Networking System Access, 2); and a collapsed section 'Type: Not Used' containing 'Type: Operator access', 'Type: Service code access', and 'Type: Trunk access'. Callouts point to: '1st and 2nd dialled digits' (pointing to the 1st and 2nd columns), 'Total quantity of dialled digits' (pointing to the 3rd column), 'Type of destination Select Networking System Access for SLNet destinations' (pointing to the 4th column), 'Destination Types in use' (pointing to the table header), and 'SLNet destination node ID 1~50' (pointing to the 5th column).

1st Dial Digit	1st and 2nd Dial Digits	Dial Digit Length	Type	Networking ID
Type: Extension access				
1	1x	3	Extension access	0
2	20	3	Extension access	0
4	4x	3	Extension access	0
6	6x	3	Extension access	0
Type: Networking System Access				
2	21	3	Networking System Access	3
2	22	3	Networking System Access	3
3	3x	4	Networking System Access	2
5	5x	3	Networking System Access	2
Type: Not Used				
+ Type: Operator access				
+ Type: Service code access				
+ Type: Trunk access				

Using the System Numbering to define the SLNet numbering plan will support the definition of the first two digits (1st and 2nd Dial Digits) to determine the remote extension numbers.

If you want to use a more detailed numbering plan then you must use F-Route Access.

The numbering plan must be setup at each system within the SLNet Network.

The example above would route:

200~209 are local extension numbers

210~229 to Node ID 3

3000~3999 to Node ID 2

500~599 to Node ID 2

SLNet Numbering Plan – Extension Numbers

Define the local extension numbers and names.

- SLNet
 - SLNet Setup
 - SLNet Numbering Plan
 - System Numbering
 - Extension Numbers
 - F-Route
 - SLNet Remote Trunk Access
 - SLNet Busy Lamp Information
 - Centralized Voicemail Setup



Station Port	Extension	Name
001	200	Recep
002	201	Lab 1
003	202	Lab2
004	203	Stores
005	204	Spare
006	205	Spare
007	206	Load Bay
008	207	Jane
009	208	Sue
010	209	spare
011		
012		
013		

SLNet Numbering Plan – F-Route

F-Route would typically be used to create a numbering plan that requires more than the first two digits to define the SLNet node ID number.

F-Route allows for up to 8 or 24 digits to be defined, this guide will only use the 8 digit option.

F-Route also supports digit manipulation and alternate route selection, these options are not included in this guide.

It is possible to use a mix of System Numbering and F-Route to setup your numbering plan.

- ***It is recommended that you first confirm the numbering plan for all systems within the network and allow for any potential future expansion***

For example:

Node ID 5 has extension numbers 4100~4129

Node ID 6 has extension numbers 4130~4149

Within **SLNet Numbering Plan – System Numbering** define the leading digits as Type: F-Route Access.

Type				
1st Dial Digit	1st and 2nd Dial Digits	Dial Digit Length	Type	Networking ID
+ Type: Extension access				
- Type: F-Route Access				
4	41	4	F-Route Access	0
+ Type: Networking System Access				
+ Type: Not Used				

Within **F-Route - SLNet – Dial Analysis Table Lead Digits** enter sufficient leading digits to be able to define the SLNet Node ID number for all remote numbers.

- [-] SLNet
 - [+] SLNet Setup
 - [-] SLNet Numbering Plan
 - [-] System Numbering
 - [-] Extension Numbers
 - [-] F-Route
 - [x] SLNet - Dial Analysis Table lead digits
 - [-] SLNet - Additional Analyse Tables
 - [-] SLNet - Cascade Additional Tables
 - [-] SLNet - Fallback F-Route
 - [-] SLNet - F-Route Table
 - [-] SLNet - Add Digit Table

Remote numbers

Use a unique F-Route table for each remote node

Table Entry	Dial Digits	Service Type	Additional Data	Dial Tone Simulation
001	410	F-Route Table	1	<input type="checkbox"/>
002	411	F-Route Table	1	<input type="checkbox"/>
003	412	F-Route Table	1	<input type="checkbox"/>
004	413	F-Route Table	2	<input type="checkbox"/>
005	414	F-Route Table	2	<input type="checkbox"/>
006		Not set	0	<input type="checkbox"/>
007		Not set	0	<input type="checkbox"/>
...				

Configure the SL2100

Within **F-Route - SLNet – F-Route Table** define the SLNet node ID number for each F-Route table. Use Priority Number 1 for each F-Route table, other F-Route options should remain at default as they are not included within this guide.

In the example:

Node ID 5 has extension numbers 4100~4129

Node ID 6 has extension numbers 4130~4149

- [-] SLNet
 - [+] SLNet Setup
 - [-] SLNet Numbering Plan
 - [-] System Numbering
 - [-] Extension Numbers
 - [-] F-Route
 - [-] SLNet - Dial Analysis Table lead digits
 - [-] SLNet - Additional Analyse Tables
 - [-] SLNet - Cascade Additional Tables
 - [-] SLNet - Fallback F-Route
 - [-] SLNet - F-Route Table
 - [-] SLNet - Add Digit Table

F-Route Table						
F-Route Table	Priority Number	Trunk Group	Delete Dial Digits	Additional Dial Digits Table	Beep Tone	
[-] F-Route Table: 001						
001	1	105	0	0		
001	2	0	0	0		
001	3	0	0	0		
001	4	0	0	0		
[-] F-Route Table: 002						
002	1	106	0	0		
002	2	0	0	0		
002	3	0	0	0		
002	4	0	0	0		

F-Route 1 =
4100~4129 route to
Node ID 5

F-Route 2 =
4130~4149 route to
Node ID 6

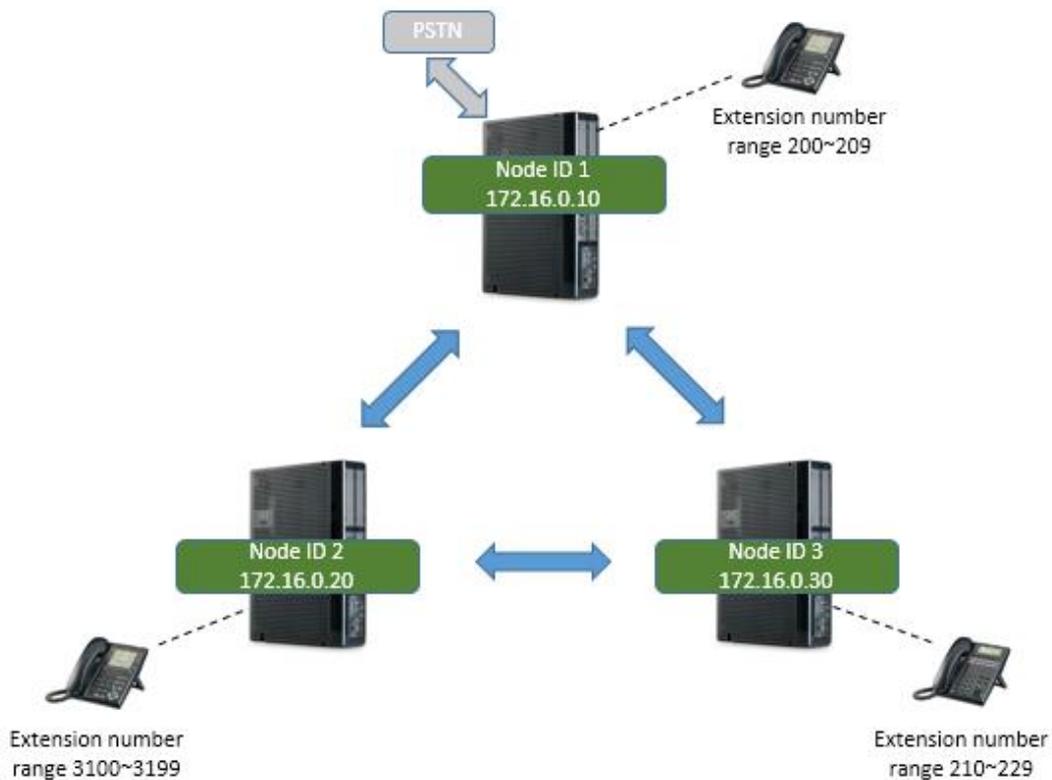
Trunk Group 101~150 =
SLNet Node ID 1~50

SLNet Remote Trunk Access

In the example Node ID 1 has PSTN trunk ports 1~8 connected, these are configured into Trunk Group 3. We will use Route 2 to target Trunk Group 3.



Trunk Routes are used to define multiple trunk groups in priority order and can be configured for each night mode. Trunk Routes are assigned to each local extension and also to any incoming trunk access requests from remote SLNet systems. Trunk routing is used when an extension dials the trunk access code setup in **System Numbering** or Function key *06 (Trunk Access via Networking)



Overview of the trunk access configuration for the example above.

Node ID 1~50	Trunk Route Access (Route number) For all night modes	Trunk Group	Trunks assigned to Trunk Group 3	SLNet Incoming Trunk Access Route for all night modes
1	2	3	1~8	-
2	1	101		2
3	1	101		2

Configure the SL2100

At Node 1 use **SLNet Remote Trunk Access – Trunk Group Routing for Extensions** to define the trunk route for each night mode that will be used for local extensions dialling the trunk access code.

- SLNet
 - SLNet Setup
 - SLNet Numbering Plan
 - SLNet Remote Trunk Access
 - Trunk Group Routing for Extensions.
 - Trunk Group Routing.
 - SLNet Incoming Trunk Access Route
 - SLNet Busy Lamp Information
 - Centralized Voicemail Setup

Define the route to be used for each night mode

Station Port	Extension	Name	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6	Mode 7	Mode 8
001	200	Recep	2	2	2	2	2	2	2	2
002	201	Lab1	2	2	2	2	2	2	2	2
003	202	Lab2	2	2	2	2	2	2	2	2
004	203	Stores	2	2	2	2	2	2	2	2
005	204	Spare	2	2	2	2	2	2	2	2
006	205	Spare	2	2	2	2	2	2	2	2
007	206	Load Bay	2	2	2	2	2	2	2	2
008	207	Jane	2	2	2	2	2	2	2	2
009	208	Sue	2	2	2	2	2	2	2	2
010	209	spare	2	2	2	2	2	2	2	2
011			1	1	1	1	1	1	1	1

At Node 1 use **SLNet Remote Trunk Access – Trunk Group Routing** to define the trunk group that will be targeted by trunk route 2.

In our example the trunks are assigned to Trunk Group 3 so we enter group 3 for priority order 1. Priority order2~4 are not required.

- SLNet
 - SLNet Setup
 - SLNet Numbering Plan
 - SLNet Remote Trunk Access
 - Trunk Group Routing for Extensions.
 - Trunk Group Routing.
 - SLNet Incoming Trunk Access Route
 - SLNet Busy Lamp Information
 - Centralized Voicemail Setup

Define the trunk group(s)

Route Table	1	2	3	4
01	0	0	0	0
02	3	0	0	0
03	0	0	0	0
04	0	0	0	0

At Node 1 use **SLNet Remote Trunk Access – SLNet Incoming Trunk Access Route** to define the route that will be used by any inbound SLNet trunk access calls.

- SLNet
 - SLNet Setup
 - SLNet Numbering Plan
 - SLNet Remote Trunk Access
 - Trunk Group Routing for Extensions.
 - Trunk Group Routing.
 - SLNet Incoming Trunk Access Route
 - SLNet Busy Lamp Information
 - Centralized Voicemail Setup

Define Route 2 for inbound trunk access calls from Nodes 2 & 3. Assign for all 8 night modes

Networking System ID		Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6	Mode 7	Mode 8
01	Route Table	1	1	1	1	1	1	1	1
02	Route Table	2	2	2	2	2	2	2	2
03	Route Table	2	2	2	2	2	2	2	2
04	Route Table	1	1	1	1	1	1	1	1

Configure the SL2100

At Nodes 2 & 3 use **SLNet Remote Trunk Access – Trunk Group Routing for Extensions** to define the trunk route used for each night mode that will be used for local extensions when dialling the trunk access code.

We will use Route 1 and route via Trunk Group 101 – this will send the trunk access call to Node 1Extrn

- SLNet
- SLNet Setup
- SLNet Numbering Plan
- SLNet Remote Trunk Access
 - Trunk Group Routing for Extensions.
 - Trunk Group Routing.
 - SLNet Incoming Trunk Access Route
- SLNet Busy Lamp Information
- Centralized Voicemail Setup

Define the route to be used for each night mode

Station Port	Extension	Name	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6	Mode 7	Mode 8
001	200	Extn 3100	1	1	1	1	1	1	1	1
002	201	Extn 3101	1	1	1	1	1	1	1	1
003	202	Extn 3102	1	1	1	1	1	1	1	1
004	203	Extn 3103	1	1	1	1	1	1	1	1
005	204	Extn 3104	1	1	1	1	1	1	1	1
006	205	Extn 3105	1	1	1	1	1	1	1	1

At Nodes 2 & 3 use **SLNet Remote Trunk Access – Trunk Group Routing** to define the trunk group that will be targeted by trunk route 2.

In our example we are routing the calls to Node 1, so the trunk group = 101 (Node number + 100)

Priority order2~4 are not required.

- SLNet
- SLNet Setup
- SLNet Numbering Plan
- SLNet Remote Trunk Access
 - Trunk Group Routing for Extensions.
 - Trunk Group Routing.
 - SLNet Incoming Trunk Access Route
- SLNet Busy Lamp Information
- Centralized Voicemail Setup

Define the trunk group.
101 = Node 1

Route Table	1	2	3	4
01	101	0	0	0
02	0	0	0	0
03	0	0	0	0

SLNet Busy Lamp Information

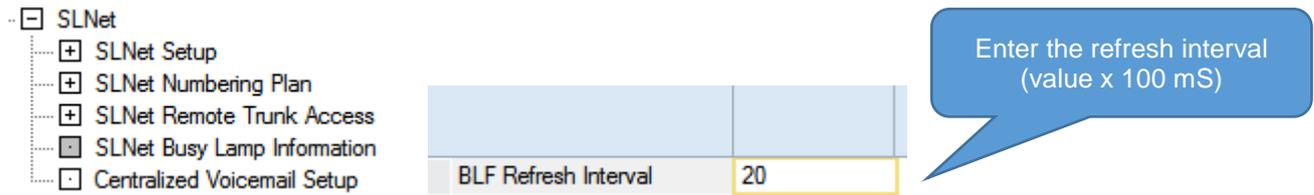
The system can show the BLF state of an extension connected to another SLNet system in the network. The state can be shown at either a DSS console or programmable function key set to DSS type.

Maximum value = 64800 (6480 Seconds).

Setting the value to zero disables the sending of SLNet Busy Lamp Information.

The recommended setting is 20 (2 Seconds).

The same value should be set at all systems that are setup to send Busy Lamp Information.



The screenshot shows a configuration menu for SLNet. On the left, a tree view lists the following options: SLNet (expanded), SLNet Setup, SLNet Numbering Plan, SLNet Remote Trunk Access, SLNet Busy Lamp Information (selected), and Centralized Voicemail Setup. To the right, a configuration table is visible with the following content:

BLF Refresh Interval	20
----------------------	----

A blue callout box with a pointer to the '20' value contains the text: "Enter the refresh interval (value x 100 mS)".

Centralised Voicemail

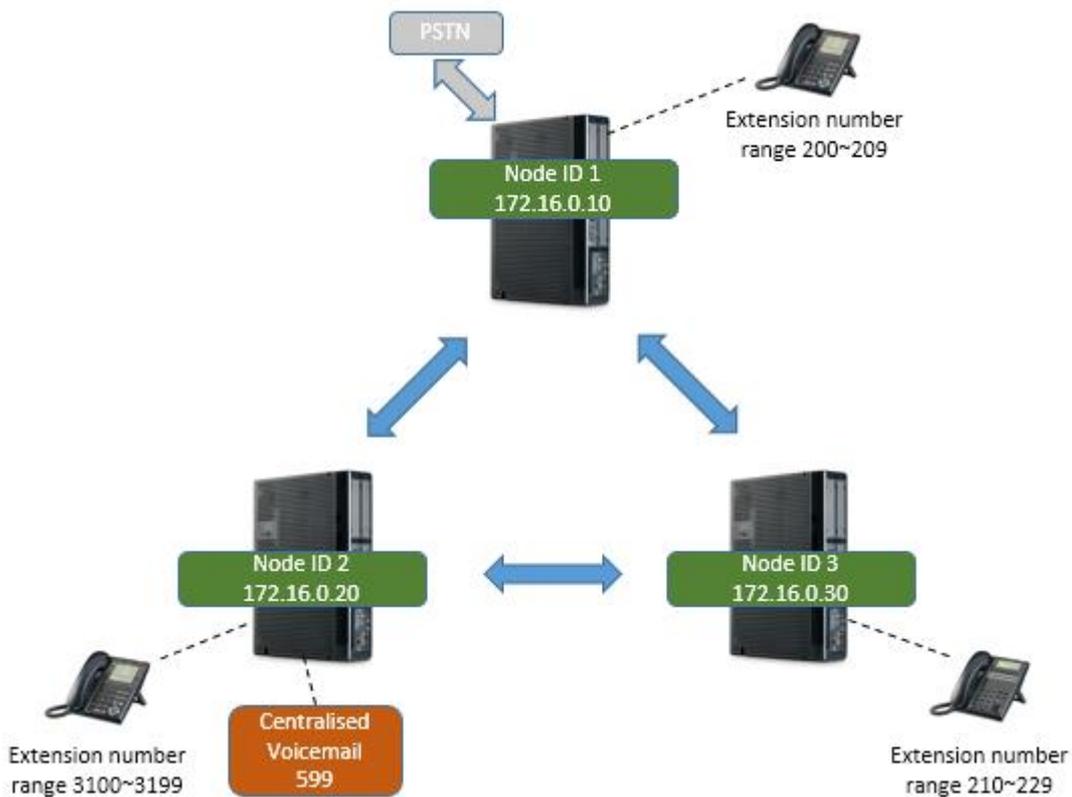
SLNet supports the option for either local InMail voicemail at each node or a Centralised InMail voicemail at one node.

Local voicemail can only be accessed by the users at the same node
 Centralised voicemail can be accessed by any user within the SLNet Network.

InMail storage is either 15 hour (SDVMS) or 120 hour (SDVML).
 There are 4 InMail channels available, this is increased to 16 when the IP7WW-EXIFB-C1 card is installed.

The Centralised voicemail pilot number must be defined as an extension number within the numbering plan at all nodes.

Users can have a voicemail key with message lamp indication, use conversation recording and Auto Attendant operation.



The configuration of Centralised voicemail will be different at the node that has the CVM installed and all other nodes.

At the node that has CVM installed.

	Node 2 (CVM installed)	Nodes 1 & 3
Voicemail Department Group	0	None
Voicemail Department Group Pilot Number	None	None
Centralized Voicemail Pilot No.	599	599
Centralized Voicemail Department Group Number (1~50)	50	None
Centralized Voicemail Name	V-mail	V-mail
NSL Protocol	enable	enable

Use **Centralized Voicemail Setup** to configure each node.

- [-] SLNet
 - [+] SLNet Setup
 - [+] SLNet Numbering Plan
 - [+] SLNet Remote Trunk Access
 - [-] SLNet Busy Lamp Information
 - [+] Centralized Voicemail Setup

At the system with Centralised InMail Voicemail installed

The configuration for the node that has the Centralised voicemail installed (**Node 2**) has a Department Group assigned to the InMail ports, Refer to the InMail Quick Install Guide for details of setting up InMail. The default is group 50.

Voice Mail Department Group	0
Centralized Voice Mail Pilot No.	599
Centralized Voice Mail Department Group Number	50
Centralized Voice Mail Name	V-Mail
NSL Protocol	<input checked="" type="checkbox"/>

Assign the name that will be displayed when calling voicemail

Enable NSL protocol

Assign the CVM Department group to the InMail ports

The local InMail Department Group must be set to 0

The CVM Pilot number must be defined in the numbering plan at all nodes

At the system(s) that do not have Centralised InMail Voicemail installed

The configuration for the nodes that does not have the Centralised voicemail installed (**Nodes 1 & 3**) does not have a Department Group assigned to the InMail ports. Define the Pilot number for Centralised voicemail and

Voice Mail Department Group	0
Centralized Voice Mail Pilot No.	599
Centralized Voice Mail Department Group Number	0
Centralized Voice Mail Name	V-Mail
NSL Protocol	<input checked="" type="checkbox"/>

Assign the name that will be displayed when calling voicemail

Enable NSL protocol

The CVM Department group must be set to 0

The local InMail Department Group must be set to 0

The CVM Pilot number must be defined in the numbering plan at all nodes

What to do if you make errors within the SL2100 Configuration

Errors that break configuration rules will be highlighted when you click the Apply button. The errors will usually show red or you will see a pop-up message depending which area you are configuring. Enter the correct value and re-apply. Then Upload your changes to the SL2100 and re-test.

Tip - Press F1 to get help within PCPro.

If you can't locate your errors within PCPro then you may need to default the SL2100 back to factory defaults and run the Initial Setup wizard again (this will only take a few minutes).

- Before doing this, download the current SL2100 configuration with PCPro and save the file to your PC, you may then be able to copy and paste the majority of your changes back in, eg the non-configuration effecting items like extension names, speed dials, programmable function keys etc.

6- Security

You should ensure that the customer's system is secure from Toll Fraud.

The Health Check feature within the InGuard Application can be used to check the system for weaknesses.

The InGuard on-board application can also be used to give the customer ongoing protection from Toll Fraud.

Refer to the InGuard Toll Fraud Guard Installation and User manuals for details.

Additional licenses are required to run On-board applications.

Use the Toll Restriction section of this guide to setup outgoing call restriction of numbers the customer does not want to dial.

There is also a separate Quick Install Guide for Toll Restriction.

Auto Attendant Dial Actions

Make sure the outside callers that are answered by the VRS can only dial known digits.

Call Management

Consider the use of a call management system or call logger to give the customer visibility of calls, InReports can be used for this.

Trunk to Trunk Transfer / Call Forward External

Do not allow these unless the customer requests the feature, ensure you setup adequate toll restriction to prevent toll fraud.

System/PCPro Passwords

Ensure you change the default passwords for:

- PCPro/WebPro
- User Pro (if used)
- DIM Access (if enabled for maintenance)

To edit the passwords using PCPro:

Search for *password* within the System Data and Easy Edit areas:

