

# ***UNIVERGE<sup>®</sup> SV8100***

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## **SIP Trunking Service Configuration Guide for COX Business**



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# *Configuring NEC SV8100 with COX Business SIP Trunking Service*

## **SECTION 1      NEC SV8100 AND COX BUSINESS SETUP GUIDE**

### **1.1      This Guide and Related Documents**

This guide was created to assist knowledgeable vendors with configuring the NEC SV8100 Communication Server with COX Business's SIP Trunking service. It provides sample entries for the required fields. The actual data is provided by COX Business when service is activated. Questions about software and hardware installation or other PBX configuration issues should be directed to NEC's National Technical Assistance Center (NTAC).

For complete details on using SIP trunks with the SV8100, refer to the SV8100 Networking Manual.

For complete details on using DID features, refer to the DID feature in the SV8100 Features and Specifications Manual.

For details about related hardware, refer to the SV8100 System Hardware Manual.

These manuals can be downloaded from NEC's National Technical Assistance Center (NTAC) web site. You must have a valid dealer ID to access the documents.

### **1.2      COX Business Account**

Contact your COX Business representative.

### **1.3      SV8100 System Software**

The SV8100 requires system software Version 6.02 or higher to use COX Business service.

## 1.4 Requirements

**With the SV8100, a VoIP gateway daughter board is required in addition to licensing for IP (SIP) trunks.**

A minimum of four IP (SIP) trunks are required due to the NEC Communications Server infrastructure setup.

The system software for the NEC Communications Server should be Version 6.02 or higher.

NEC recommends that the requirements and programming are completed with as much information as possible before scheduling an activation appointment with COX Business.

## 1.5 Limitations

The following limitations apply:

- Some private IP network ranges conflict with SIP trunking service providers ranges. This can cause issues when connecting to the SIP trunking service provider. Private ranges reserved for the customer's LAN are:

10.x.x.x

192.168.0.x through 192.168.10.x

## SECTION 2      **NEC PBX CONFIGURATION**

This section provides information to NEC's solution providers and NEC Associates for configuring an NEC UNIVERGE SV8100 to connect to a COX Business SIP Trunk service provider, utilizing a **STATIC** configuration.

### **2.1 Prerequisites**

Before you configure the UNIVERGE SV8100, you must have the following information available.

#### 2.1.1 SIP Trunking Information from COX Business

- Primary SIP Proxy Server IP Address
- Number Plan, if applicable for the Point-to-Point Connection
- Trunking DID(s)  
The DID(s) are forwarded to the Public WAN IP address(s), DNS or DNS SRV records of the PBX.
- SIP Registration – Authentication Username (User ID), and Password.

#### 2.1.2 NEC UNIVERGE SV8100

- SV8100 CPU firmware Version 6.02 or higher
- IPLA/B (PZ-XX)
- SIP Trunking License (minimum of four licenses)
- Digital, IP and TDM Telephones

#### 2.1.3 Installation Worksheet

Use the worksheet to record the information needed for setting up the SIP Trunking service.

**Table 1 Installation Worksheet**

<b>WAN Side:</b>	
Internet Access Type and Speed:	
WAN IP Address:	
WAN Subnet Mask:	
WAN Gateway IP Address:	

<b>LAN Side:</b>	
LAN IP Address for SIParator or EdgeMarc:	
LAN Subnet Mask:	
LAN IP Address for SV8100:	
VLAN ID:	

<b>PBX Information:</b>	
Model:	
Firmware Version:	
Number of SIP Trunk Licenses:	
Add-on Software Applications:	
Number of Users:	
Number of Concurrent Calls:	

<b>Notes:</b>

## SECTION 3 SV8100 PROGRAMMING

When using COX Business as your SIP trunking service provider, the following programs must be changed for SIP trunking service.

When using PCPro or WebPro for programming, enabling an option may be a checkbox option rather than entering a '1' as in terminal programming.

### 3.1 Trunk Type / Slot Configuration

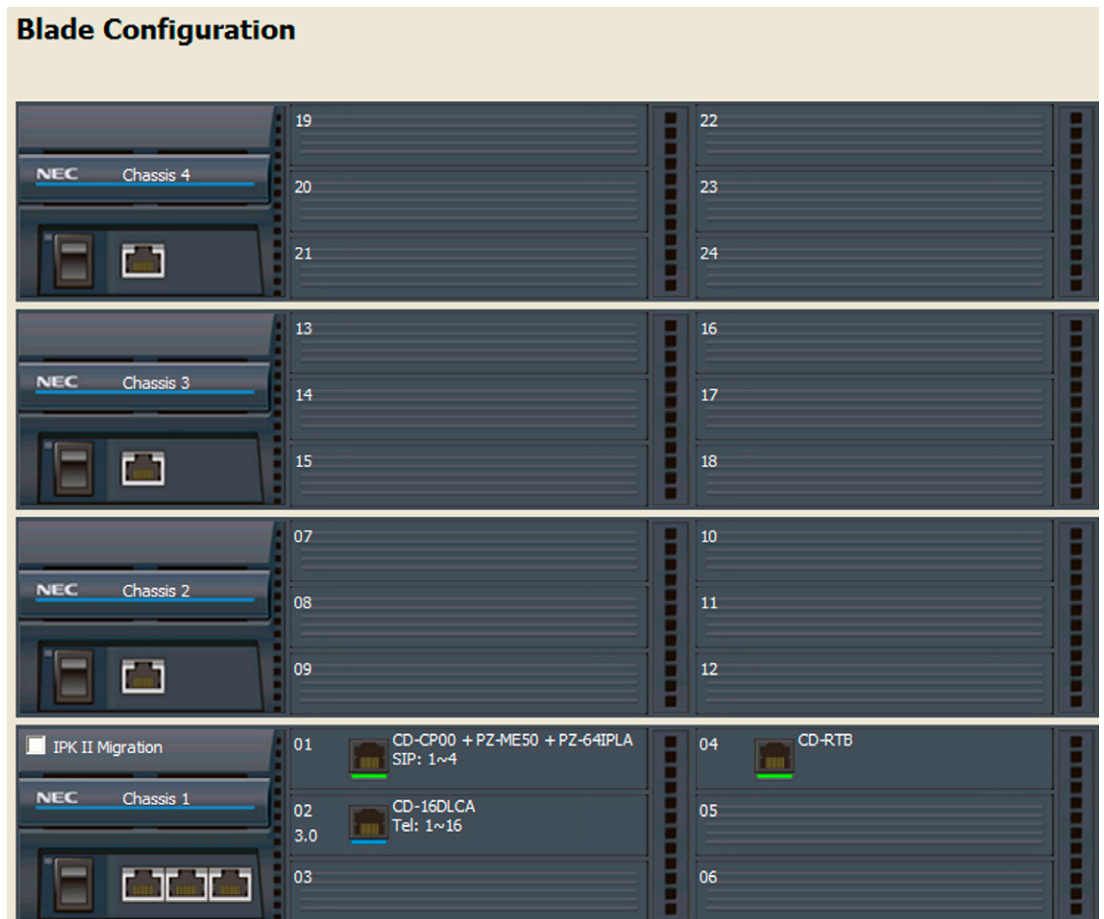


Figure 1 Blade Configuration

**System Data** Grid View Apply Cancel Default

**10-03: IPL Configuration**

Slot: CD-CP00 + PZ-32IPL - Chassis 1 - Slot 01 (1) Physical Port (1~200) 1

Physical Port	Trunk Logical Port	Trunk Type	CCIS Trunk	Physical Port	Trunk Logical Port	Trunk Type	CCIS Trunk
001	5	SIP	Not CCIS	009	13	SIP	Not CCIS
002	6	SIP	Not CCIS	010	14	SIP	Not CCIS
003	7	SIP	Not CCIS	011	15	SIP	Not CCIS
004	8	SIP	Not CCIS	012	16	SIP	Not CCIS
005	9	SIP	Not CCIS	013	17	SIP	Not CCIS
006	10	SIP	Not CCIS	014	18	SIP	Not CCIS
007	11	SIP	Not CCIS	015	19	SIP	Not CCIS
008	12	SIP	Not CCIS	016	20	SIP	Not CCIS

Use Program 10-03: ETU Setup to setup and confirm the Basic Configuration data for each ETU. When changing a defined terminal type, first set the type to '0' and then plug the new device in to have the system automatically define it or you may have to reset the ETU.

**Figure 2 IPLA/IPLB Configuration**

**10-03-02: Blade Setup, for IPLA/IPLB (VoIPDB)**

Define the trunks to be used for SIP trunks as 1 (SIP).

**System Data**

**10-19: IPL DSP Resource Selection**

Slot: CD-CP00 + PZ-32IPL - Chassis 1 - Slot 01 (1) DSP Resource (1~128): 1

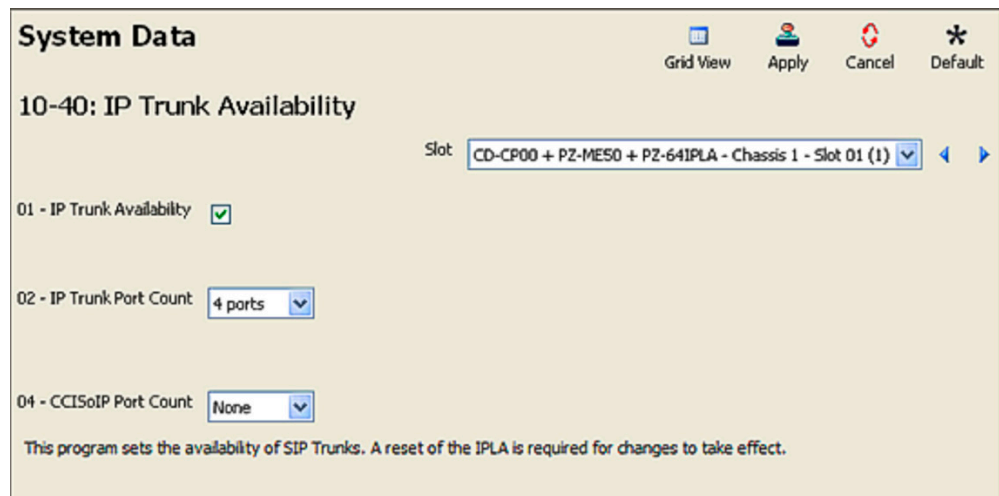
DSP Resource	DSP Resource	DSP Resource
001	Used for IP extensions	009
002	Commonly used for both IP extensions and trunks	010
003	Commonly used for both IP extensions and trunks	011
004	Commonly used for both IP extensions and trunks	012
005	Commonly used for both IP extensions and trunks	013
006	Commonly used for both IP extensions and trunks	014
007	Commonly used for both IP extensions and trunks	015
008	Commonly used for both IP extensions and trunks	016

This program sets the IPL DSP resource selection.

**Figure 3 IPLA/IPLB DSP Resource Selection**

**10-19-01 : VOIP DSP Resource Selection**

Specify the operating mode for the DSP resources (0=common use (extensions and trunks), 1=IP extensions only, 2=SIP trunks only, 3=Networking, 4=NetLink, 5=Blocked, 6=Common without Unicast, 7=Multicast Paging, 8=Unicast Paging).



The screenshot shows a configuration window titled "System Data" with a subtitle "10-40: IP Trunk Availability". At the top right, there are four icons: "Grid View", "Apply", "Cancel", and "Default". Below the title, there is a "Slot" dropdown menu showing "CD-CP00 + PZ-ME50 + PZ-64IPLA - Chassis 1 - Slot 01 (1)". The main configuration area contains three items:

- 01 - IP Trunk Availability: A checkbox that is checked.
- 02 - IP Trunk Port Count: A dropdown menu set to "4 ports".
- 04 - CCISoIP Port Count: A dropdown menu set to "None".

At the bottom of the configuration area, there is a note: "This program sets the availability of SIP Trunks. A reset of the IPLA is required for changes to take effect."

**Figure 4 IP Trunk Availability**

**10-40-01 : IP Trunk Availability – IP Trunk Availability**

Turn this option "on".

**10-40-02 : IP Trunk Availability – IP Trunk Port Count**

Select the number of trunks being used.



## 3.2 CD-CP00 Network Setup

*Values shown are for example purposes only. Your actual IP values will be determined by your local LAN administrator.*

**System Data**

Grid View Apply Cancel Default

**10-12: CD-CP00 Network Setup**

01 - IP Address

02 - Subnet Mask

03 - Default Gateway

04 - Time Zone

05 - NIC Setting

06 - NAPT Router

07 - NAPT Router IP Address

08 - ICMP Redirect

09 - IPL IP Address

10 - IPL Subnet Mask

11 - IPL NIC Setting

13 - DNS Primary Address

14 - DNS Secondary Address

15 - DNS Port

Use Program 10-12: CPU00 Network Setup to setup the IP Address, Subnet-Mask and Default Gateway addresses.  
Caution: If any of the IP Address or NIC settings are changed, the system must be reset in order for the changes to take affect.

**Figure 5 CD-CP00 Network Setup**

### 10-12-01 : CD-CP00 Network Setup – IP Address

Set the LAN IP address for the system ethernet port to 0.0.0.0

### 10-12-02 : CD-CP00 Network Setup – Subnet Mask

Set the subnet mask for the system ethernet port to be different than the subnet for the IPLA/IPLB blade.

### 10-12-03 : CD-CP00 Network Setup – Default Gateway

Set the default gateway for the IPLA/IPLB blade.

**If a router or firewall is placed between the SIP Trunk Provider and SV8100,**  
you must also set the following programs:

### 10-12-06 : CD-CP00 Network Setup – NAPT Router


Turn this program on if the SV8100 resides behind a NAT router.

### 10-12-07 : CD-CP00 Network Setup – NAPT Router IP Address

Set the WAN IP address of the NAT router behind the SV8100.

**10-12-09 : CD-CP00 Network Setup – IP Address**

Select the IP address for the VoIP connection (default: 172.16.0.10). A static IP address is required.

 *IP address is required by the CD-CP00. Some private IP network ranges (ex: 192.168.0.0/16, 172.16.0.0/12) conflict with SIP Service Provider's Network ranges which may cause issues when connecting SIP connect service. Private ranges reserved for the customer's LAN are 10.x.x.x and 192.168.0.x through 192.168.10.x.*

**The SV8100 must be reset in order for the change to take effect.**

**10-12-10 : CD-CP00 Network Setup – Subnet Mask**

Select the Subnet Mask to be used by the VoIP server (default: 255.255.0.0).

**3.3 IPLA/IPLB DSP Basic Setup**

*Values shown are for example purposes only. Your actual IP values will be determined by your local LAN administrator.*

**System Data**

84-26: IPL DSP Basic Setup

Slot: CD-CP00 + PZ-MES0 + PZ-128IPL - Chassis 1 - Slot 01 (1)

VoIP Gateway	IP Address	RTP Port	RTCP Port
1	10.10.3.20	10020	10021
2	10.10.3.21	10052	10053
3	10.10.3.22	10084	10085
4	10.10.3.23	10116	10117
5	0.0.0.0	10148	10149
6	0.0.0.0	10180	10181
7	0.0.0.0	10212	10213
8	0.0.0.0	10244	10245

**Figure 6 IPLA/IPLB DSP Basic Setup**

**Port Forwarding:**

The Router will require port forwarding rules to be configured.

**Port 5060 must be forwarded to the address entered in Program 10-12-09.**

Port 5060 is not used for remote terminals - ports 5070 and 5080 are used instead. Port 5060 is only used for trunking so there are no issues with the possible fraudulent usage of unauthorized remote attempts to register remote terminals.

**The ports used in Programs 84-26-02 and 84-26-03 must be forwarded to the IP address entered in Program 84-26-01.**

The RTP/RTCP ports are forwarded to avoid possible one-way conversation which might occur on inbound calls. When forwarding the ports, the range for each gateway must be set. The number of gateways to forward will depend on the size of the IPLA/B.

- Gateway 1 will require ports 10020-10051 forwarded.
- Gateway 2 will require ports 10052-10083 forwarded.
- Gateway 3 will require ports 10084-10115 forwarded.
- Gateway 4 will require ports 10116-10147 forwarded.
- Gateway 5 will require ports 10148-10179 forwarded.
- Gateway 6 will require ports 10180-10211 forwarded.
- Gateway 7 will require ports 10212-10243 forwarded.
- Gateway 8 will require ports 10244-10275 forwarded.

**Table 2 Port Table**

Ports	UDP	TCP
5060	Yes	No
10020	Yes	No
10021	Yes	No
10052	Yes	No
10053	Yes	No
10084	Yes	No
10085	Yes	No
10116	Yes	No
10117	Yes	No

**Table 3 Router Forwarding (Gateway Table)**

<b>IPLA/IPLB Size</b>	<b>Gateway</b>	<b>IP Address</b>	<b>RTP Port</b>	<b>RTCP Port</b>	<b>UDP</b>
<b>IPLB32/64/128</b>	1				
<b>IPLA32</b>	2				
	3				
<b>IPLA64</b>	4				
	5				
	6				
	7				
<b>IPLA128</b>	8				

**Example: Router configuration shown from the NEC InRouter/4300T Router**

```
udp;143.101.120.218/255.255.255.0-10020>10.10.3.20-10020
```

```
udp;143.101.120.218/255.255.255.0-10021>10.10.3.20-10021
```

```
udp;143.101.120.218/255.255.255.0-10052>10.10.3.21-10052
```

```
udp;143.101.120.218/255.255.255.0-10053>10.10.3.21-10053
```

```
udp;143.101.120.218/255.255.255.0-10084>10.10.3.22-10084
```

```
udp;143.101.120.218/255.255.255.0-10085>10.10.3.22-10085
```

```
udp;143.101.120.218/255.255.255.0-10116>10.10.3.23-10116
```

```
udp;143.101.120.218/255.255.255.0-10117>10.10.3.23-10117
```

```
udp;143.101.120.218/255.255.255.0-5060>10.10.3.10-5060
```

### 3.4 SIP System Information Setup

**Values shown are for example purposes only. Your actual values will be determined by your implementation team.**

**Figure 7 SIP System Information Setup**

#### 10-28-01 : SIP System Information Setup – Domain Name

Define the Domain name up to 64 characters. This information is specific to your market and is provided by your SIP Trunking Service Provider.

- When configuring Domain name, the SIP service provider will supply the Proxy/Domain in the following manner - "Host Name" . "Domain Name" . The characters are normally separated by "." The characters **after** "." will be in the Domain Name.*
- Cox does not use DNS or domain names, the static LAN IP address of the Cox E-SBC should be entered for the domain name field.*

#### 10-28-02 : SIP System Information Setup – Host Name

Define the Host name, up to 48 characters.

- When configuring Host name, the SIP service provider will supply the Proxy/Domain in the following manner - "Host Name" . "Domain Name" . The characters are normally separated by "." The characters **before** "." will be in the Domain Name.*
- Cox does not use a host name, the static LAN IP address of the Cox E-SBC should be entered for the host name field.*

#### 10-28-03 : SIP System Information Setup – Transport Protocol

Define the Transport type. This option is always set to 0 (UDP).

#### 10-28-04 : SIP System Information Setup – User ID

This information is provided by your SIP Trunking Service Provider.

Entries: 32 characters maximum (Default=No Entry).

- Typically the ten digit billing telephone number is used. This entry must be numeric as Program 10-23-04 does not allow text entry - only numeric.*

**10-28-05 : SIP System Information Setup – Domain Assignment**

Determine the type of Domain Assignment. Set this entry to 1 (Domain Name).

**10-28-06 : SIP System Information Setup – IP Trunk Port Binding**

Set this entry to 0 (Disable) to allow an incoming call to use the lowest port.

**3.5 SIP Server Information Setup**

*Values shown are for example purposes only. Your actual values will be determined by your implementation team.*

**System Data**

**10-29: SIP Server Information Setup**

01 - Outbound Default Proxy

02 - Inbound Default Proxy

03 - Default Proxy IP Address

04 - Default Proxy Port

05 - Register Mode

06 - Registrar IP Address

07 - Registrar Port

08 - DNS Mode

09 - DNS IP Address

10 - DNS Port

11 - Registrar Domain Name

12 - Proxy Domain Name

13 - Proxy Host Name

14 - SIP Carrier Choice

15 - Registration Expiry Time

16 - Register Sub Mode

17 - DNS Source Port

**Figure 8 SIP Server Information Setup**

**10-29-01 : SIP Server Information Setup – Outbound Default Proxy**

Enable (1) the SIP Outbound Proxy.

*If entries are made in Program 10-29-xx for a SIP Server and the SIP Server is then removed or not used, the entries in Program 10-29-xx must be set back to their default settings. Even if 10-29-01 is set to .0. (off), the SV8100 will check the settings in the remaining 10-29 programs.*

**10-29-03 : SIP Server Information Setup – Default Proxy IP Address**

Define the SIP Trunk Service Provider Proxy IP Address. You may resolve the IP address of the Outbound Proxy by pinging the URL.

**10-29-05 : SIP Server Information Setup – Registrar Mode**

Set the Registrar Mode to 1(manual) with SIP trunking.

**10-29-06 : SIP Server Information Setup – Registrar IP Address**

Input the IP address of the SIP registrar (if given).

**10-29-08 : SIP Server Information Setup – SIP Proxy Setup – DNS Mode**

Set the DNS Mode to 1, when the SIP carrier provides a domain name.

**10-29-09 : SIP Server Information Setup – SIP Proxy Setup – DNS IP Address**

This information should be provided by your SIP service provider.


 *The DNS IP Address should be any valid Domain Name Server either SIP provided or within your network.*

**10-29-11 : SIP Server Information Setup – SIP Proxy Setup – Registrar Domain Name**

Define the Registrar Domain Name. This information should be provided by your SIP service provider (128 characters maximum).


**10-29-12 : SIP Server Information Setup – Proxy Domain Name**

Enter the Domain name.

 *When configuring the Domain name, the SIP service provider will supply the Proxy/Domain in the following manner - "Host Name" . "Domain Name" . The characters are normally separated by "." The characters **after** "." will be in the Domain Name.*

**10-29-13 : SIP Server Information Setup – Proxy Host Name**

Enter the Host name.

 *When configuring Domain name the SIP service provider will supply the Proxy/Domain in the following manner - "Host Name" . "Domain Name" . The characters are normally separated by "." The characters **before** "." will be in the Host Name.*

**10-29-14 : SIP Server Information Setup – SIP Carrier Choice**

Set the SIP Carrier Choice to 0 (Default).

**10-29-15 : SIP Server Information Setup – Registration Expiry Time**

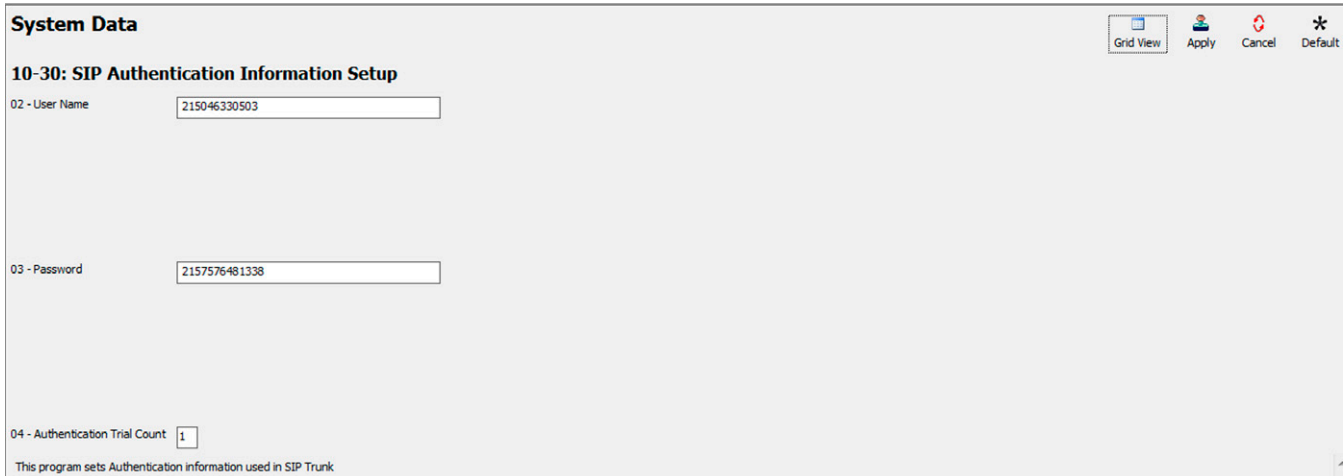
It is **important** to leave this automatic re-registration time to be 3600 seconds so that the COX Business network does not get flooded.

**10-29-16 : SIP Server Information Setup – Register Sub Mode**

Unchecking the Register Sub Mode (setting it to "off") will allow all trunk calls to be routed based on routing policies.

## 3.6 SIP Authentication Information Setup

*Values shown are for example purposes only. Your actual values will be determined by your implementation team.*



The screenshot shows a web-based configuration interface titled "System Data". The main heading is "10-30: SIP Authentication Information Setup". There are three input fields: "02 - User Name" with the value "215046330503", "03 - Password" with the value "2157576481338", and "04 - Authentication Trial Count" with the value "1". At the bottom left, there is a note: "This program sets Authentication information used in SIP Trunk". At the top right, there are four buttons: "Grid View", "Apply", "Cancel", and "Default".

**Figure 9 SIP Authentication Information Setup**

### **10-30-02 : SIP Authentication Information Setup – User Name**

Define the authentication User Name provided by COX Business as defined in Program 10-28-04. This information is provided by your SIP Service Provider.

Entries: 48 characters maximum.

### **10-30-03 : SIP Authentication Information Setup – Password**

Enter the COX Business authentication password. This information is provided by your SIP Service Provider.

Entries: 48 characters maximum.



### 3.7 IP System Interconnection Setup

*Values shown are for example purposes only. Your actual values will be determined by your implementation team.*

**System Data**

10-23: IP System Interconnection Setup

Sys No. (1~1000)

Sys No.	System Interconnection	IP Address	Call Control Port	Dial Number
0001	<input type="checkbox"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="1720"/>	<input type="text"/>
0002	<input type="checkbox"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="1720"/>	<input type="text"/>
0003	<input type="checkbox"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="1720"/>	<input type="text"/>
0004	<input type="checkbox"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="1720"/>	<input type="text"/>
0005	<input type="checkbox"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="1720"/>	<input type="text"/>
0006	<input type="checkbox"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="1720"/>	<input type="text"/>
0007	<input type="checkbox"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="1720"/>	<input type="text"/>
0008	<input type="checkbox"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="1720"/>	<input type="text"/>
0009	<input type="checkbox"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="1720"/>	<input type="text"/>
0010	<input type="checkbox"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="1720"/>	<input type="text"/>

This program sets the IP system interconnection .

**Figure 10 IP System Interconnection Setup**

#### 10-23-01 : System Interconnection

Enable interconnection to the SIP Server.

#### 10-23-02 : IP Address

Enter the IP Address of the SIP Server.

#### 10-23-04 : Dial Number

Enter the digits to be sent to the SIP Server on an outbound call.

### 3.8 Calling Party Information (Trunk)

**Caller ID** - In the Invite message there are two fields that can have caller ID. One field is the “SIP From Address” and the other field is “SIP Display Info”. If both of these fields are left blank the call will not complete.

Below is an example of a SIP Invite Message with outbound CID.

```
From "2142622000"<sip:test@172.16.0.100>
```

#### **14-12-01 : SIP Register ID Setup for IP Trunks**

On a per trunk basis, you can choose a SIP register ID of 0~31. If the ID is left to 0, the “SIP from Address” would not be assigned on a per trunk basis. If set to 1~31, it then looks at command 10-36-02 to populate the “SIP from Address” field.

#### **14-12-02 : SIP Register ID Setup for IP Trunks**

This is for SIP trunks to the provider for inbound purposes. If 10-28-06 (Trunk port Binding) is enabled, inbound calls map to the trunk. If you want to create a hunt group when trunk port binding is enabled, set multiple trunks to the same pilot and then define that number in 10-36.

#### **10-36-02 : SIP Trunk Registration Information**

Per registration ID 1~31 you can assign what will be populated in the “SIP from Address” field.

#### **15-16-01 : SIP Register ID Setup for Extensions**

Per station you can choose a SIP register ID of 1~31. If left blank the “SIP from Address” would not be assigned on a per station basis. If assigned, it will look at Program 10-36-02 to populate the “SIP from Address” field. This takes priority over command 14-12-01.

#### **10-28-04 : SIP System Information Setup – User ID**

This is the default “Display Info” and “From Address” if either of these fields is blank what is assigned in this command will be inserted. This setting has the lowest priority and if any of the next commands are set they will be sent out instead of this command.

### 3.9 Class of Service Options (Outgoing Call Service)

*Values shown are for example purposes only. Your actual values will be determined by your implementation team.*

**System Data**

20-08: Class of Service Options (Outgoing Call Service)

Class of Service (1~15) 1

01 - Intercom Call	<input checked="" type="checkbox"/>
02 - Outgoing Trunks	<input checked="" type="checkbox"/>
03 - Common Speed Dials	<input checked="" type="checkbox"/>
04 - Group Speed Dials	<input checked="" type="checkbox"/>
05 - Dial Number Preview	<input checked="" type="checkbox"/>
06 - Toll Restriction Override	<input type="checkbox"/>
07 - Repeat Redial	<input checked="" type="checkbox"/>
08 - Toll Restriction Dial Blocking	<input type="checkbox"/>
09 - Hotline for Handpiece	<input type="checkbox"/>
10 - Handsfree Answerback/Forced Intercom Ringing Switching	<input checked="" type="checkbox"/>
11 - Call Mode Switching Protection from Caller (Internal Call)	<input type="checkbox"/>
12 - Department Group Step Calling	<input checked="" type="checkbox"/>
13 - ISDN Clip	<input checked="" type="checkbox"/>
14 - Set Calling Sub Address	<input type="checkbox"/>
15 - Block Outgoing Caller ID	<input type="checkbox"/>

**Figure 11 Class of Service Options**

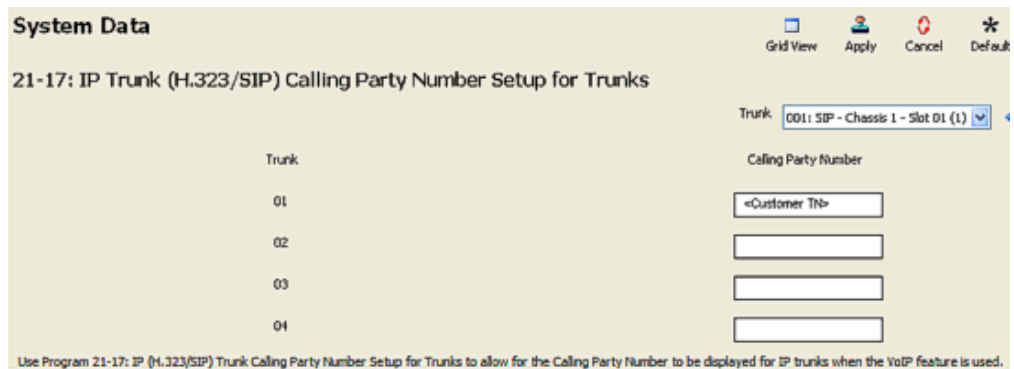
#### **20-08-13 : Class of Service Options (Outgoing Call Service) – ISDN Clip**

This needs to be turned ON per COS, if you are trying to send any information on a per station basis. If turned OFF, it will still send the trunk information if set.

#### **20-09-02: Class of Service Options (Incoming Call Service) Caller ID Display**

This needs to be turned ON per COS, if you want to receive caller ID.

### 3.10 IP Trunk Calling Party Number Setup



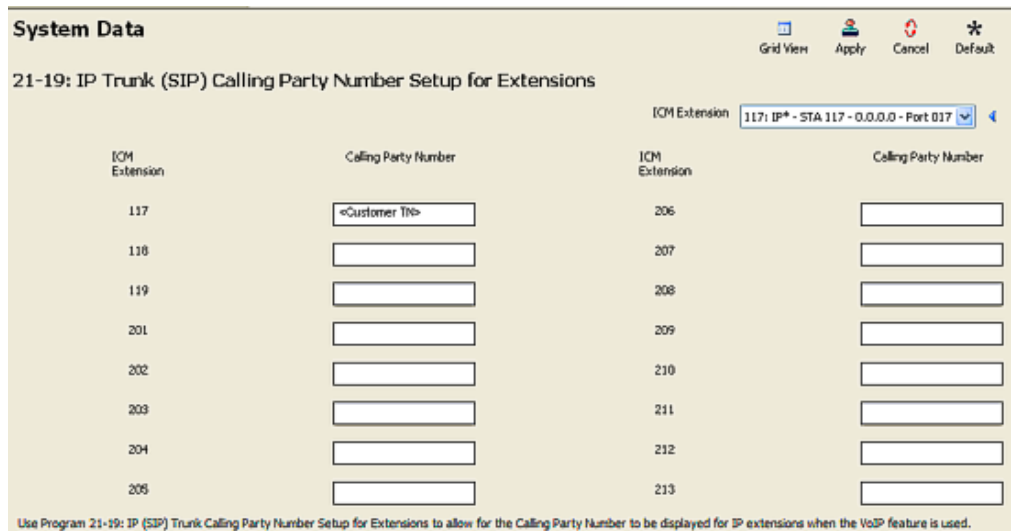
**Figure 12 IP Trunk (H.323/SIP) Calling Party Number Setup for Trunks**

#### 21-17-01: Calling Party Number Setup for Trunks

On a per trunk basis this populates the “SIP Display Info” field. If a station has a setting in 21-19-01, it will override this field.

### 3.11 IP Trunk (SIP) Calling Party Number Setup for Extensions

*Values shown are for example purposes only. Your actual values will be determined by your implementation team.*



**Figure 13 IP Trunk (SIP) Calling Party Number Setup for Extensions**

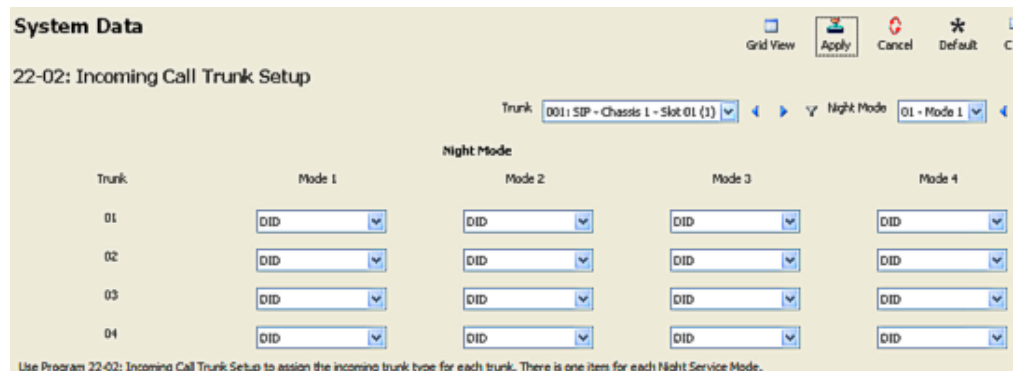
### 21-19-01 : IP Trunk (SIP) Calling Party Number Setup for Extensions

On a per station basis this populates the “SIP Display Info” field. This setting has the highest priority.

This program is used to assign the Calling Party Number for each extension (Entries: 1~0, \*, #). The assigned number is sent to the SIP Trunking Service Provider when the caller places an outgoing call. If the Calling Party Number is assigned by both Program 21-17 and 21-18/21-19, then the system uses the data in Program 21-18/21-19. Do not use Program 21-13 for SIP. This entry must be a 10-digit DID associated with the SIP Trunking Service Provider Account. DID numbers are provided by your SIP Trunking Service Provider Coordinator.

## 3.12 DID (TN to ext map)

*Values shown are for example purposes only. Your actual values will be determined by your implementation team.*



Trunk	Mode 1	Mode 2	Mode 3	Mode 4
01	DID	DID	DID	DID
02	DID	DID	DID	DID
03	DID	DID	DID	DID
04	DID	DID	DID	DID

Use Program 22-02: Incoming Call Trunk Setup to assign the incoming trunk type for each trunk. There is one item for each Night Service Mode.

**Figure 14 Incoming Call Trunk Setup**

### 22-02-01 : Incoming Call Trunk Setup

Define the SIP trunks as type 3 (DID). In addition to the SIP trunk programming, refer to the DID feature in the SV8100 Features and Specifications Manual for additional DID programming (e.g., 14-05, 22-04, 22-09, 22-10, 22-11, 22-12, 22-13, 22-17, 34-01).

### 3.13 DTMF Configuration

*Values shown are for example purposes only. Your actual values will be determined by your implementation team.*

**84-13: SIP Trunk Codec Setup**

21 - Signal Limiter	Mode 5
22 - Echo Celler Non-linear Processing Mode	2 wire only
26 - TX Gain	<input type="range" value="0.0dBm (20)"/>
27 - RX Gain	<input type="range" value="0.0dBm (20)"/>
28 - Audio Capability Priority	G.711_PT
31 - DTMF Payload Number	110
32 - DTMF Relay Mode	RFC2833
33 - G.722 Maximum Audio Frame Size	30ms
34 - G.722 Voice Activity Detection	<input type="checkbox"/>
35 - G.722 Minimum Jitter Buffer Size	30
36 - G.722 Average Jitter Buffer Size	60
37 - G.722 Maximum Jitter Buffer Size	120
38 - G.726 Maximum Audio Frame Size	30ms
39 - G.726 Voice Activity Detection	<input type="checkbox"/>
40 - G.726 Minimum Jitter Buffer Size	30
41 - G.726 Average Jitter Buffer Size	60
42 - G.726 Maximum Jitter Buffer Size	120
43 - iLBC Maximum Audio Frame Size	30ms

**Figure 15 SIP Trunk Codec Setup**

**84-13-32 : SIP Trunk CODEC Information Basic Setup – DTMF Relay Mode**  
Set the DTMF setup to 1 (RFC2833).

### 3.14 ToS Setup

*Values shown are for example purposes only. Your actual values will be determined by your implementation team.*

**System Data** Grid View Apply Cancel Default

**84-10: ToS Setup**

Protocol Type	ToS Mode	IP Precedence Priority	IP Precedence Delay	IP Precedence Throughput	IP Precedence Reliability	IP Precedence Cost	Priority (Diffserve)
DRS	Disabled	0	Normal	Normal	Normal	Normal	0
Protims	Disabled	0	Normal	Normal	Normal	Normal	0
Voice Control	Disabled	0	Normal	Normal	Normal	Normal	0
H.323	Disabled	0	Normal	Normal	Normal	Normal	0
RTP/RTCP	Diffserve	0	Normal	Normal	Normal	Normal	40
SIP	Disabled	0	Normal	Normal	Normal	Normal	0
CCIS	Disabled	0	Normal	Normal	Normal	Normal	0
DT700	Disabled	0	Normal	Normal	Normal	Normal	0
SIP Trunk	Diffserve	0	Normal	Normal	Normal	Normal	46
NetLink	Disabled	0	Normal	Normal	Normal	Normal	0

This program sets the ToS Data.

**Figure 16 ToS Setup**

#### 84-10-01 : ToS Setup – ToS Mode

For the RTP/RTCP (Protocol type 5) and SIP Trunk (Protocol type 9), set the ToS Mode to “2” (Diffserv).

**The SV8100 must be reset in order for the change to take effect.**

#### 84-10-07 : ToS Setup – Priority (Diffserv)

For each of the following protocol types, set the following priorities:

RTP/RTCP (Protocol type 5): **Priority 40.**

SIP Trunk (Protocol type 9): **Priority 46.**

**The SV8100 must be reset in order for the change to take effect.**

### 3.15 SIP Trunk Basic Setup

*Values shown are for example purposes only. Your actual values will be determined by your implementation team.*

System Data

Grid View
 Apply
 Cancel

#### 84-14: SIP Trunk Basic Setup

01 - Invite ReTx Count	<input style="width: 40px;" type="text" value="7"/>
02 - Request ReTx Count	<input style="width: 40px;" type="text" value="11"/>
03 - Response ReTx Count	<input style="width: 40px;" type="text" value="7"/>
04 - Request ReTx Start Time	<input style="width: 40px;" type="text" value="5"/>
05 - Request Max ReTx Interval	<input style="width: 40px;" type="text" value="40"/>
06 - SIP Trunk Port	<input style="width: 40px;" type="text" value="5060"/>
07 - Session Timer Value	<input style="width: 40px;" type="text" value="0"/>
08 - Minimum Session Timer Value	<input style="width: 40px;" type="text" value="1800"/>
09 - Called Party Info	<input style="width: 40px;" type="text" value="Request URI"/>
10 - URL Type	<input style="width: 40px;" type="text" value="SIP-URL"/>
11 - URL/TO Header Information	<input style="width: 40px;" type="text" value="Proxy Server Domain"/>

Use Program 84-14: SIP Trunk Basic Information Setup to define the basic setup for SIP trunks.

**Figure 17 SIP Trunk Basic Setup**

#### **84-14-11 : SIP Trunk Basic Setup – URL/To Header Setting Information**

Set this program to Proxy Server Domain.

**Changes within this program require the SV8100 be reset in order for the change to take effect.**




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## SECTION 4 INITIAL TESTING AND TROUBLESHOOTING

To confirm that the system is correctly set, perform the following tests:

 *If you run into an issue with any of these tests, refer to [Table 4 Troubleshooting Guide](#). Test an outgoing call to a local number. Check for ringback, 2-way audio and quality.*

1. Test an outgoing call to a long distance number. Check for ringback, 2-way audio and quality.
2. Test an outgoing call to an international number. Check for ringback, 2-way audio and quality.
3. Test a outgoing call lasting more than 15 minutes.
4. Test multiple call concurrences on outgoing calls. Setup multiple calls to PSTN.
5. Test an outgoing call to an Operator '0'.
6. Test an outgoing call to directory assistance '411'.
7. Test a 911 call.



***Identify to the operator that this is a TEST!***

8. Test an incoming call to an internal DID. Check for ringback, 2-way audio and quality.
9. Test an incoming call to an auto-attendant. Check DTMF and audio quality.
10. Test transferring calls off-site.
11. Test an outgoing call to an auto-attendant and verify DTMF.

Table 4 Troubleshooting Guide

Issue	Cause	Remedy
<b>No Calls IN/Out</b>	○ Router Configuration	○ Check Router Configuration
	○ NEC Configuration	○ Check NEC Configuration
	○ Unqualified IP Address	○ Note WAN IP Address and Contact Provider
<b>No Calls Out</b>	○ NEC Configuration	○ Check NEC Configuration
	○ Unqualified IP Address	○ Note WAN IP Address and Contact Provider
<b>No Calls In</b>	○ NEC Configuration	○ Check NEC Configuration
	○ Unqualified IP Address	○ Note WAN IP Address and Contact Provider
<b>One-Way Audio</b>	○ NEC Configuration	○ Check NEC Configuration
<b>Echo</b>	○ Excessive Delay	○ Check LAN and WAN for high latency
	○ Echo Cancellation Issue	○ Check Echo settings and/or consult COX Business
<b>Call Dropping</b>	○ Internet Access Issues	○ Call Internet Access Provider
	○ Extreme Latency on LAN	○ Check Latency on LAN
	○ SIP issue	○ Contact Provider
<b>Static or HUM on Phones</b>	○ Power issue	○ Check power if using AC, should not be issue in PoE
<b>Missing Parts of Words</b>	○ Packet Loss or Latency on LAN	○ Check LAN
	○ Packet Loss or Latency on WAN	○ Check with Internet Access Provider
	○ Jitter Buffer Configuration	○ Check with NEC