

## Spectrum Enterprise SIP Trunking Service NEC UNIVERGE SV9300 V3.2.1+ IP PBX Configuration Guide

### About Spectrum Enterprise:

Spectrum Enterprise is a division of Charter Communications following a merger with Time Warner Cable and acquisition of Bright House Networks. Spectrum Enterprise is a national provider of scalable, fiber technology solutions. The Spectrum Enterprise portfolio includes networking and managed services solutions, including Internet access, Ethernet and Managed Network Services, Voice, TV and Cloud solutions. Our industry-leading team of experts works closely with clients to achieve greater business success.

### About this document:

Spectrum Enterprise assures IP PBX compatibility by conducting interoperability testing to ensure any potential compatibility issues have been resolved prior to installation. Please review the IP PBX configuration instructions in this guide prior to your installation date.

Be advised that this document may contain references to Time Warner Cable Business Class. All references to Time Warner Cable Business Class, TWCBC or TWC should be read as Spectrum Enterprise.

**Thank you,**

**Spectrum Enterprise**

# ***UNIVERGE*<sup>®</sup> SV9300**

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## **SIP Trunk Programming Guide for Spectrum Enterprise**



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Communications Technology Group



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# *Configuring NEC SV9300 for SIP Trunking*

## **SECTION 1      NEC SV9300 SETUP GUIDE**

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

This guide was created to assist knowledgeable vendors with configuring the NEC SV9300 Communication Server and a SIP Trunking service. It provides sample entries for the required fields. The actual data is provided by your SIP trunk provider 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 SV9300, refer to the SV9300 System Manual.

For complete details on using DID features, refer to the DID feature in the SV9300 Features and Specifications Manual.

For details about related hardware, refer to the SV9300 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      SIP Trunk Account Information**

Contact your SIP trunk provider representative.

 *This guide is intended for Legacy Time Warner Cable Business Class Communications Platform.*

### **1.3      SV9300 System Software**

The SV9300 requires system software **V3.2.1** or higher.

## 1.4 Requirements

With the SV9300, 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 **V3.2.1** or higher.

NEC recommends that the requirements and programming are completed with as much information as possible before scheduling an activation appointment with your SIP trunk provider.

## 1.5 Limitations

The following limitations apply:

- Faxing is not supported for Spectrum Enterprise SIP trunks, it is recommended to have analog lines for faxing and modem connectivity.
- SIP diversion header is not supported – Call forwarding to 8xx numbers
- SIP Privacy – Cannot mark the calling party number as private or restricted
- Secondary SIP server for failover is not supported
- Spectrum Enterprise SIP trunks are supported as registered and non-registered.

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## SECTION 2      **NEC PBX CONFIGURATION**

This section provides information to NEC's solution providers and NEC Associates for configuring an NEC UNIVERGE SV9300 to connect to a SIP Trunk service provider.

### 2.1      **Prerequisites**

Before you configure the UNIVERGE SV9300, you must have the following information available.

#### 2.1.1      SIP Trunking Information from SIP trunk provider

- Primary SIP Proxy Server IP Address and SIP account information.
- 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.

#### 2.1.2      NEC UNIVERGE SV9300

- SV9300 CPU software version **V3.2.1** or higher
- VOIPDB (PZ-64IPLC-A, PZ-128IPLC-A, GPZ-64IPLD or GPZ-128IPLD)
- SIP Trunk Port 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

WAN Side:	
Internet Access Type and Speed:	
WAN IP Address:	
WAN Subnet Mask:	
WAN Gateway IP Address:	

LAN Side:	
LAN IP Address for SIParator or EdgeMarc:	
LAN Subnet Mask:	
LAN IP Address for SV9300:	
VLAN ID:	

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

Notes:

## SECTION 3 SV9300 PROGRAMMING

The following commands must be changed for SIP trunking service.

### 3.1 System Version and License Check

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

After connecting, check the SV9300 software version. This is located in the bottom right hand corner of the Main PCPro screen.

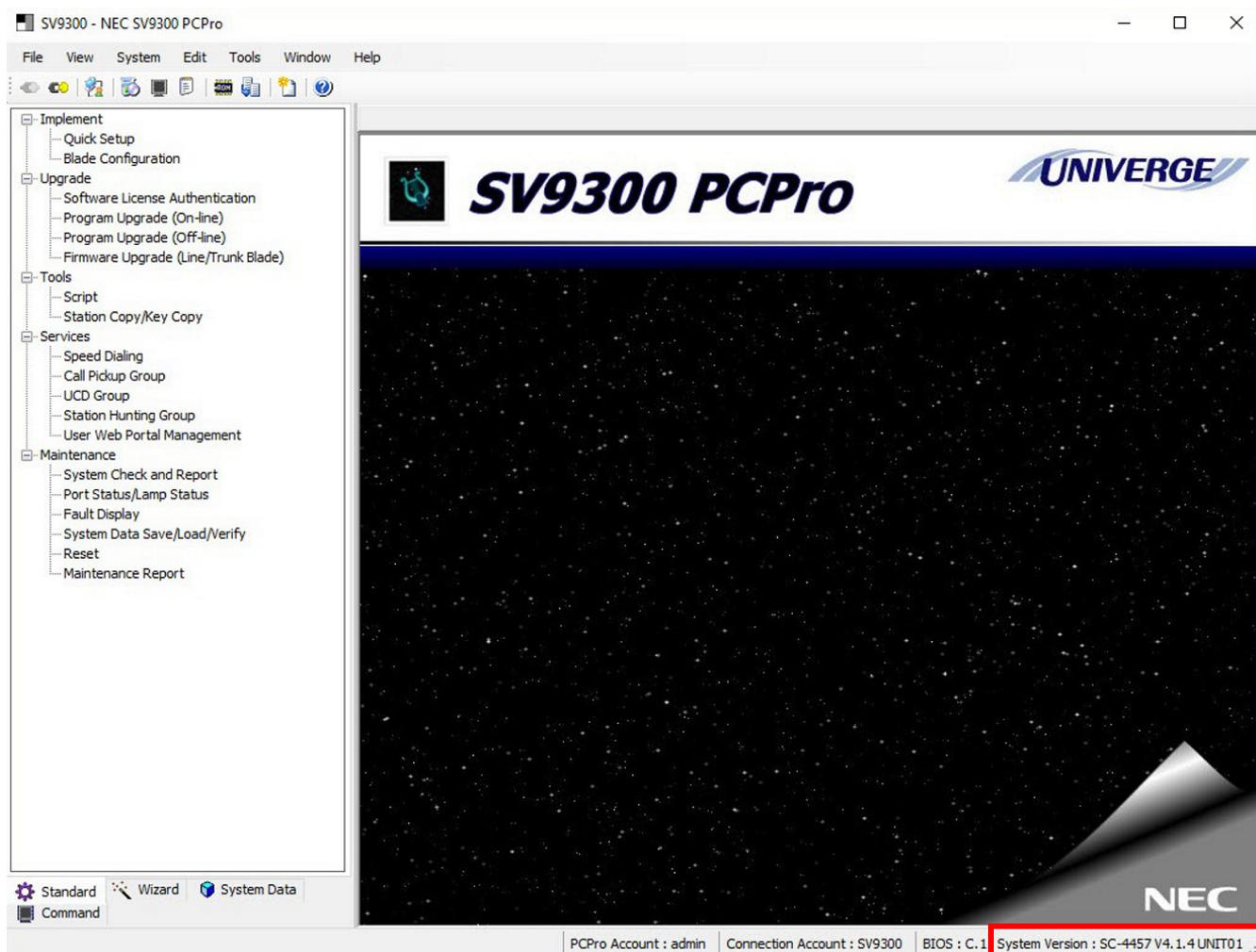


Figure 1 System Version

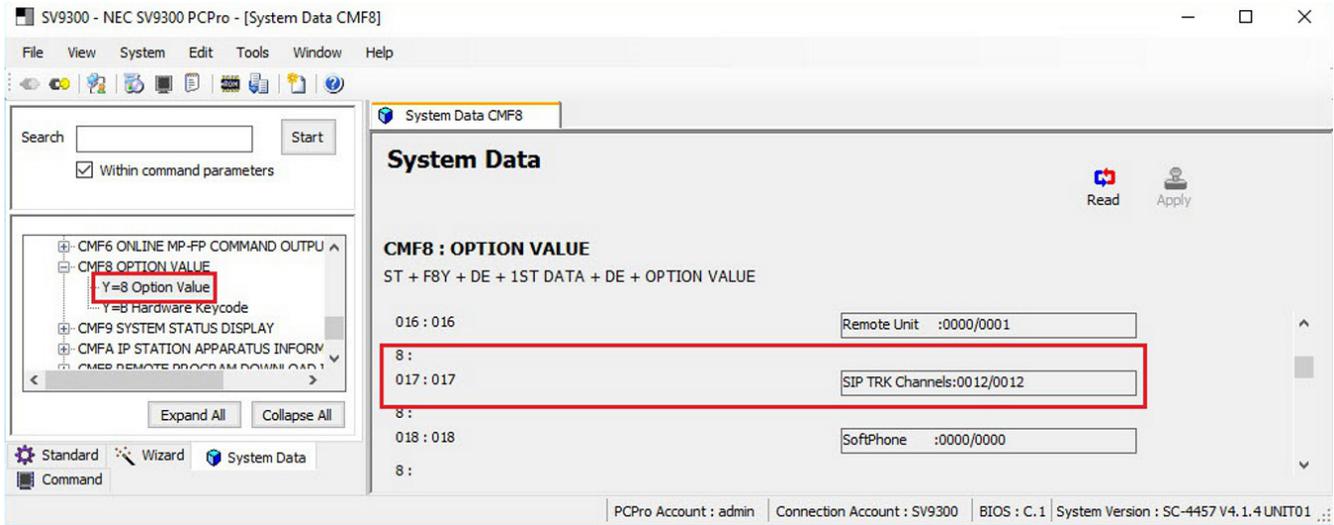
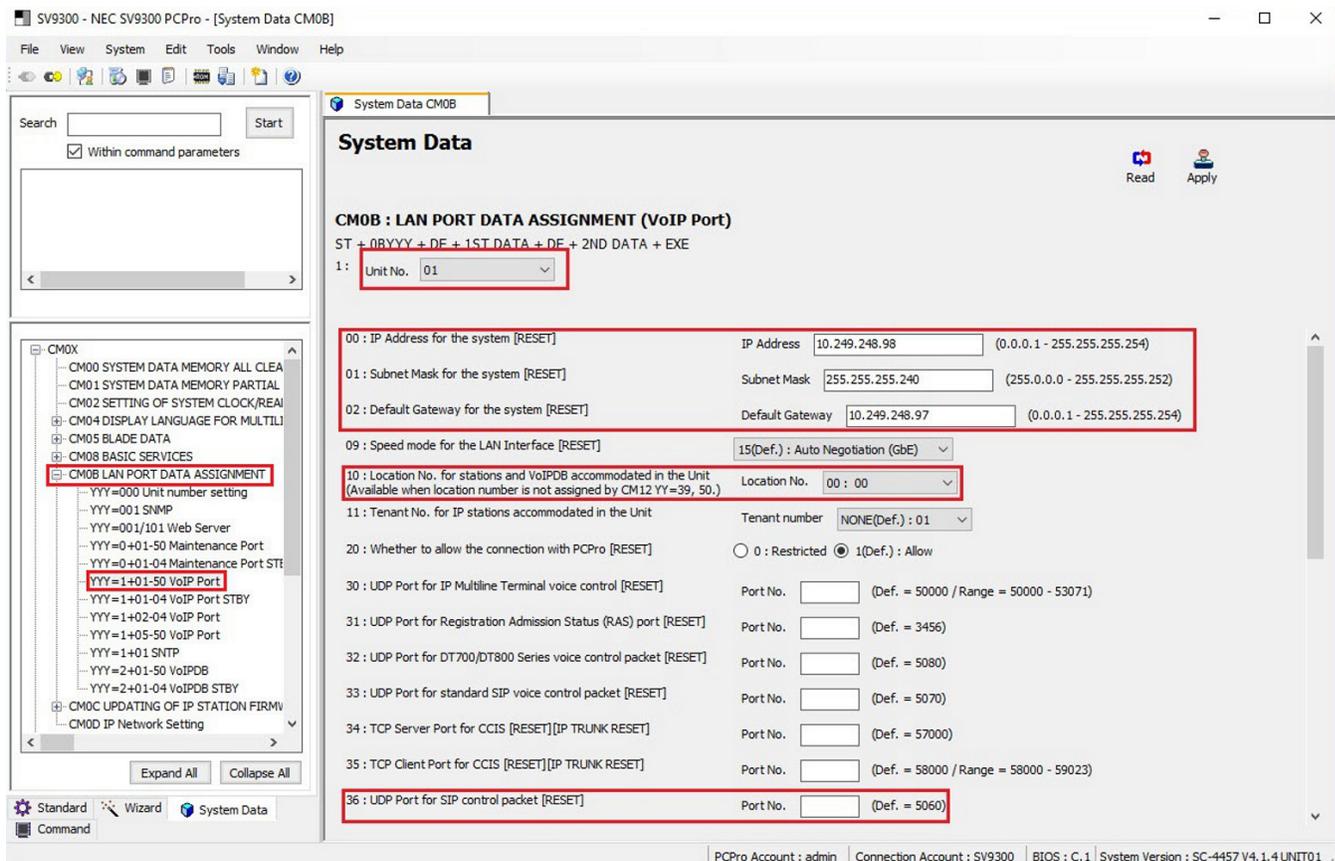


Figure 2 CM F88 SIP Trunk Port Licenses

## 3.2 CC-CP00 Network Setup

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



**Figure 3 CM 0B1xx Network Setup**

1. Select **SV9300 Main/Remote Unit No.** accommodating SIP Trunk Channels, then click **Read** to get the current data settings.
2. **FD=00** Enter SV9300 VoIPDB IP Address.  
**FD=01** Enter SV9300 VoIPDB Subnet Mask.  
**FD=02** Enter SV9300 VoIPDB Default Gateway Address.
3. **FD=10** Set VoIPDB location number.
4. **FD=36** Leave **Blank** to use default port 5060 for SIP trunk control packets. Change this only at the request of Spectrum Enterprise. It was requested to change for test environment.

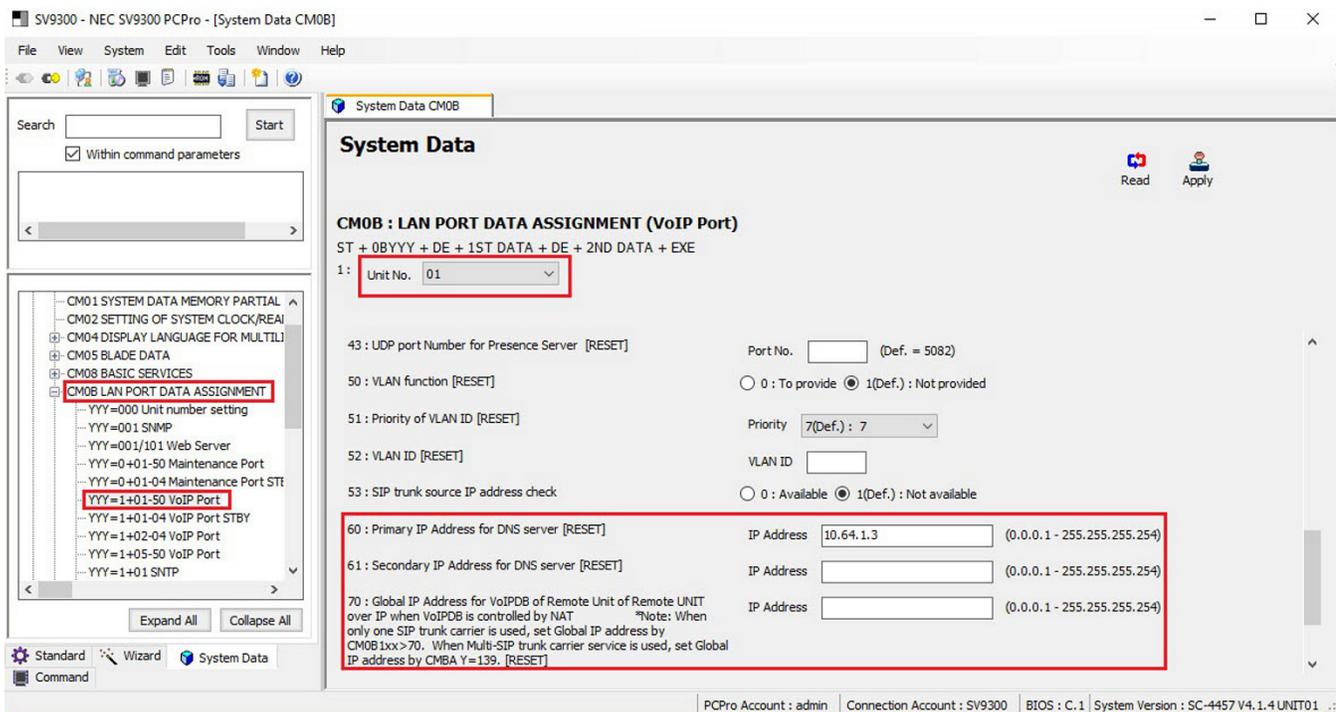
5. Click **Apply**.**Command Line Example: Unit 01**

```

CM 0B101>00>192.168.0.210           (Unit 01 VoIP Address)
CM 0B101>01>255.255.255.0         (Unit 01 VoIP Subnet)
CM 0B101>02>192.168.0.1           (Unit 01 VoIP Default GW)
CM 0B101>10>NONE                   (Default: Location 00)
CM 0B101>36>5061                   (Default: SIP Trunk Port 5060)

```

**The SV9300 must be reset in order for the change to take effect.**



**Figure 4 CM 0B1xx Network Setup (continued)**

1. Select **SV9300 Main/Remote Unit No.** accommodating SIP Trunk Channels, then click **Read** to get the current data settings.
2. **FD=60** Enter primary DNS server IP Address (optional).  
**FD=61** Enter secondary DNS server IP Address (optional).  
**FD=70** Enter global IP Address (optional).

*If more than 1 profile is used enter global IP address in CM BA139.*

*The IP addresses shown are example only and will depend on the network for the global address and Spectrum Enterprise for DNS specific information.*

3. Click **Apply**.

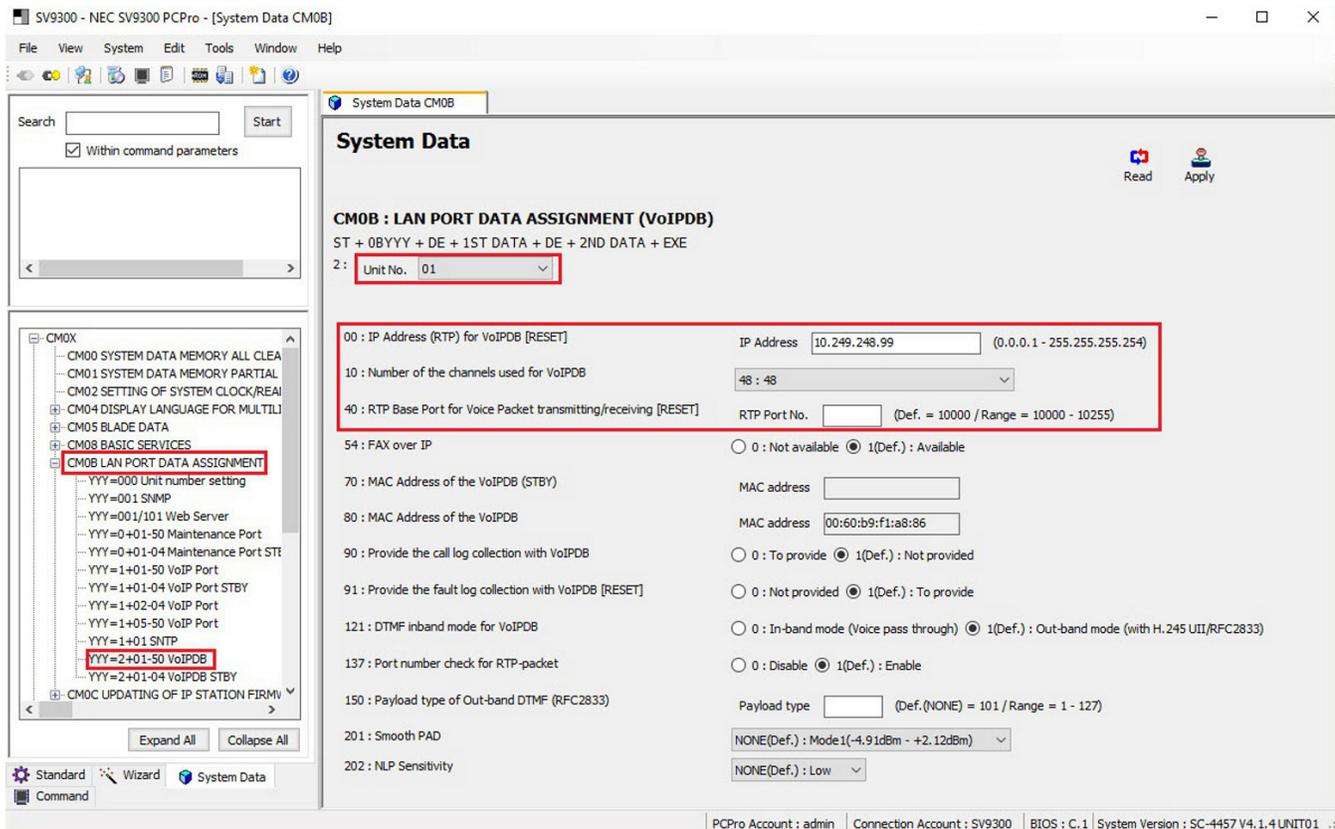
**Command Line Example: Unit 01**

CM 0B101>60>216.136.95.2	(Unit 01 Primary DNS Server Address)
CM 0B101>61>64.132.94.250	(Unit 01 Secondary DNS Server Address)
CM 0B101>02>128.191.252.97	(Unit 01 Global IP Address)

**The SV9300 must be reset in order for the change to take effect.**

### 3.3 IP PAD Network Settings

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



**Figure 5 CM 0B2xx IP PAD Network Settings**

1. Select **SV9300 Main/Remote Unit No.** accommodating SIP Trunk Channels, then click **Read** to get the current data settings.
2. **FD=00** Enter VoIP IPPAD IP address.  
**FD=10** Select number of VoIP IPPAD channels.
3. **FD=40** Change this port only if recommended. 31000 was changed for test environment. This will not likely need to be changed.
4. Click **Apply**.

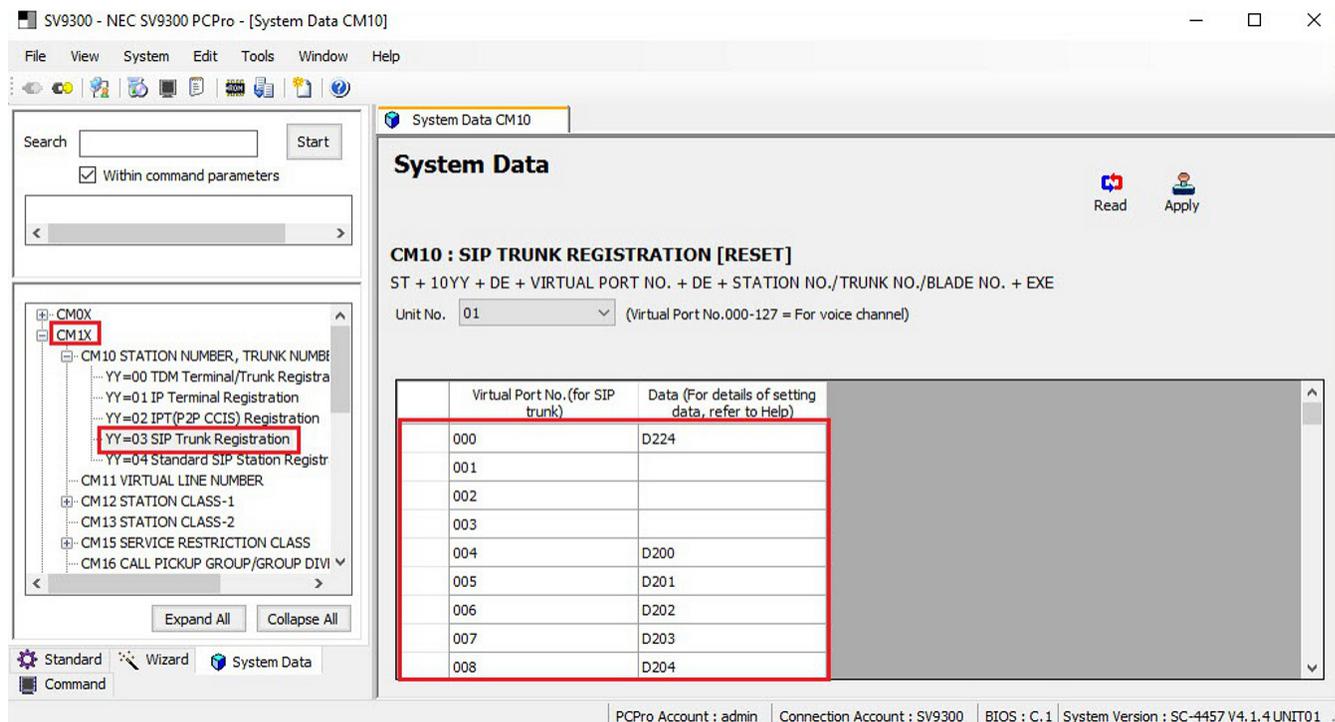
#### Command Line Example: Unit 01

```
CM 0B201>00>192.168.0.211          (Unit 01 VoIP IPPAD Address)
CM 0B201>10>32                    (Unit 01 VoIP IPPAD Channels)
CM 0B201>40>31000                (RTP Base port setting)
```

The SV9300 must be reset in order for the change to take effect.

### 3.4 SIP Trunk Port Allocation

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



**Figure 6 CM 1003 SIP Trunk Port Allocation**

1. Select **SV9300 Main/Remote Unit No.** accommodating SIP Trunk Channels, then click **Read** to get the current data settings.
2. Enter **Trunk Numbers** used for the voice channels.
3. Click **Apply**.

#### Command Line Example: Unit 01

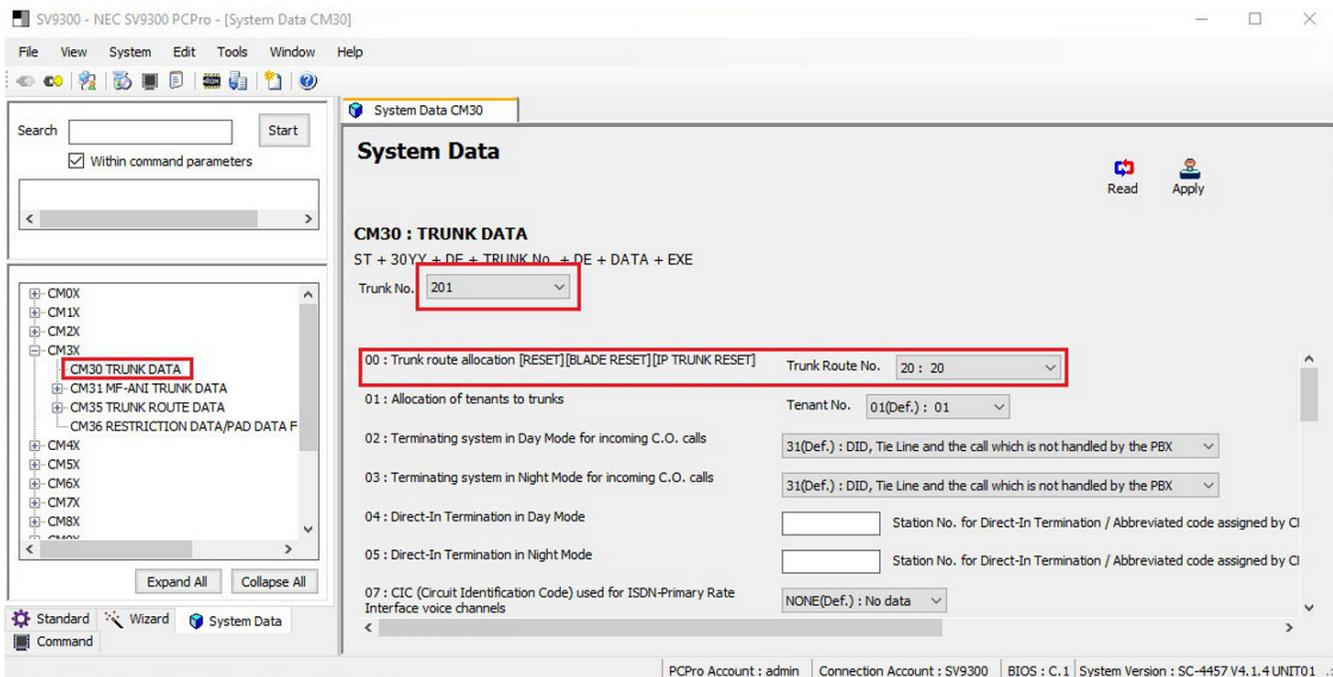
```

CM 1003>01000>D001           (Unit 01 SIP Trunk Channel 1)
CM 1003>01001>D002           (Unit 01 SIP Trunk Channel 2)
CM 1003>01002>D003           (Unit 01 SIP Trunk Channel 3)
CM 1003>01003>D004           (Unit 01 SIP Trunk Channel 4)

```

### 3.5 SIP Trunk Port Settings

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



**Figure 7 CM 30 SIP Trunk Port Settings**

1. Select each **Voice Channel** and click the **Read** button to get the current data settings.
2. **YY=00** Assign the same **Trunk Route Number** to each voice channel.
  - If multiple SIP trunk servers are in service, separate routes must be used for each server.*
3. Click **Apply**.

#### Command Line Example: Route 01

```

CM 3000>001>01           (Voice Trunk Route Number 01)
CM 3000>002>01           (Voice Trunk Route Number 01)
CM 3000>003>01           (Voice Trunk Route Number 01)
CM 3000>004>01           (Voice Trunk Route Number 01)

```

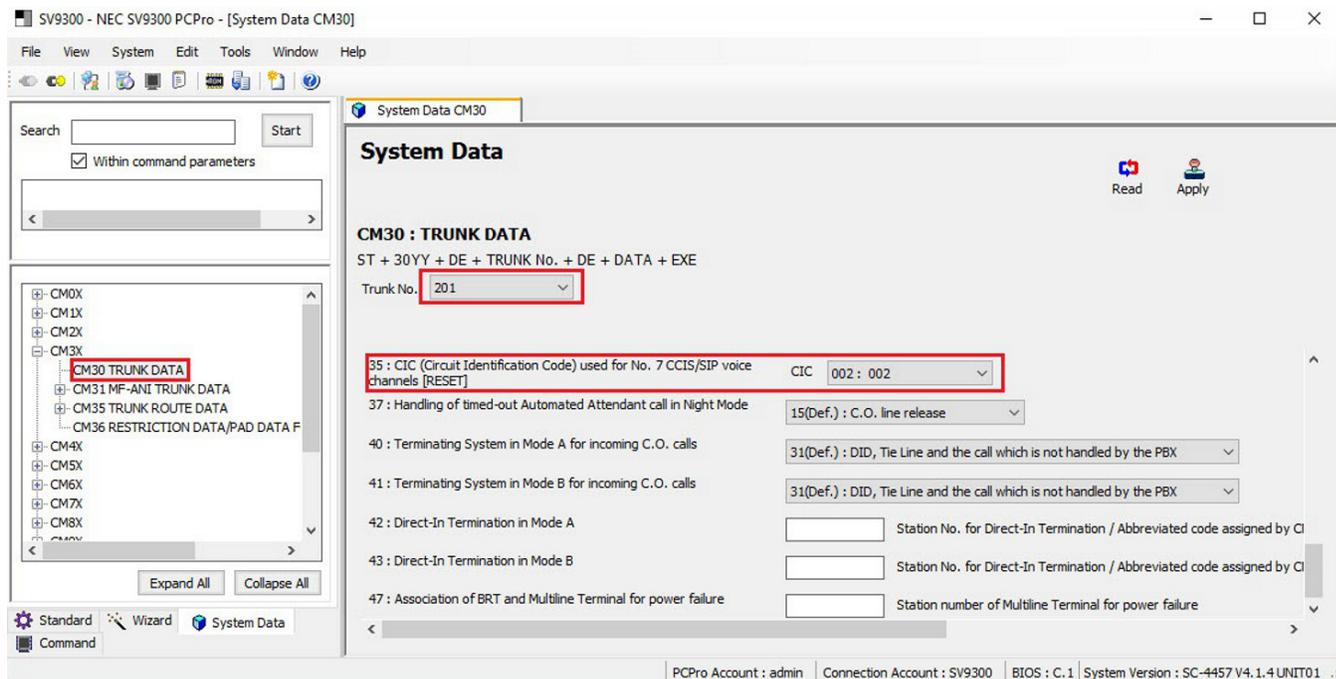


Figure 8 CM 30 SIP Trunk Port Settings (continued)

1. Select each **Voice Channel** and click the **Read** button to get the current data settings.
2. **YY=35** Assign **CIC** number to each voice trunk.

*CICs should be assigned in order of voice trunks (i.e. trunk 001= CIC 001, trunk 002=CIC 002 ...).*

*For each SIP trunk server CICs will start at 001 (i.e. SIP trunk server 1 uses CICs 001, 002, ... and SIP trunk server 2 will use CICs 001, 002, ...).*

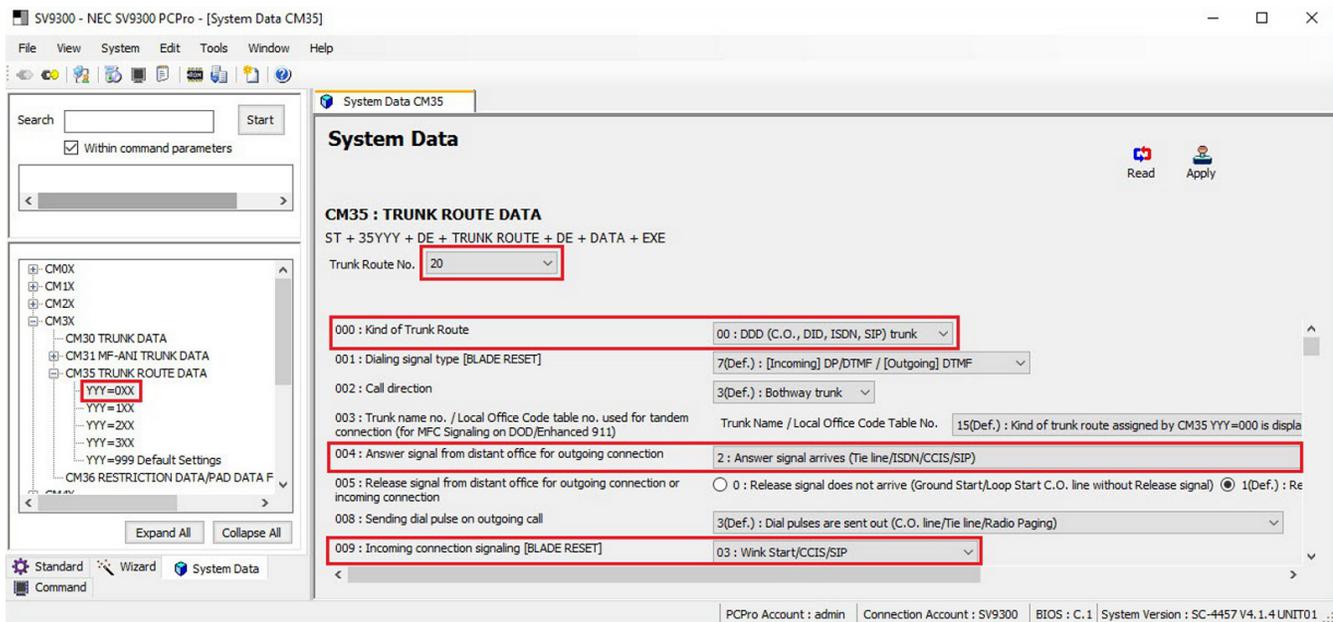
3. Click **Apply**.

**Command Line Example:**

CM 3035>001>001	(Assign CIC to Channel 1)
CM 3035>002>002	(Assign CIC to Channel 2)
CM 3035>003>003	(Assign CIC to Channel 3)
CM 3035>004>004	(Assign CIC to Channel 4)

## 3.6 SIP Trunk Route Settings

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



**Figure 9 CM 35 SIP Trunk Route Settings**

1. Select the **Trunk Route Number** assigned to voice channels and click the **Read** button to get current data settings.
2. **YYY=000** Select **00** for SIP trunk service.
3. **YYY=004** Select **2** for SIP trunk service.
4. **YYY=009** Select **03** for SIP trunk service.
5. Click **Apply**.

**Command Line Example:**

```
CM 35000>01>00          (SIP Trunk Route Data: Provide SIP Service)
CM 35004>01>2          (SIP Trunk Route Data: Provide SIP Service)
CM 35009>01>03        (SIP Trunk Route Data: Provide SIP Service)
```

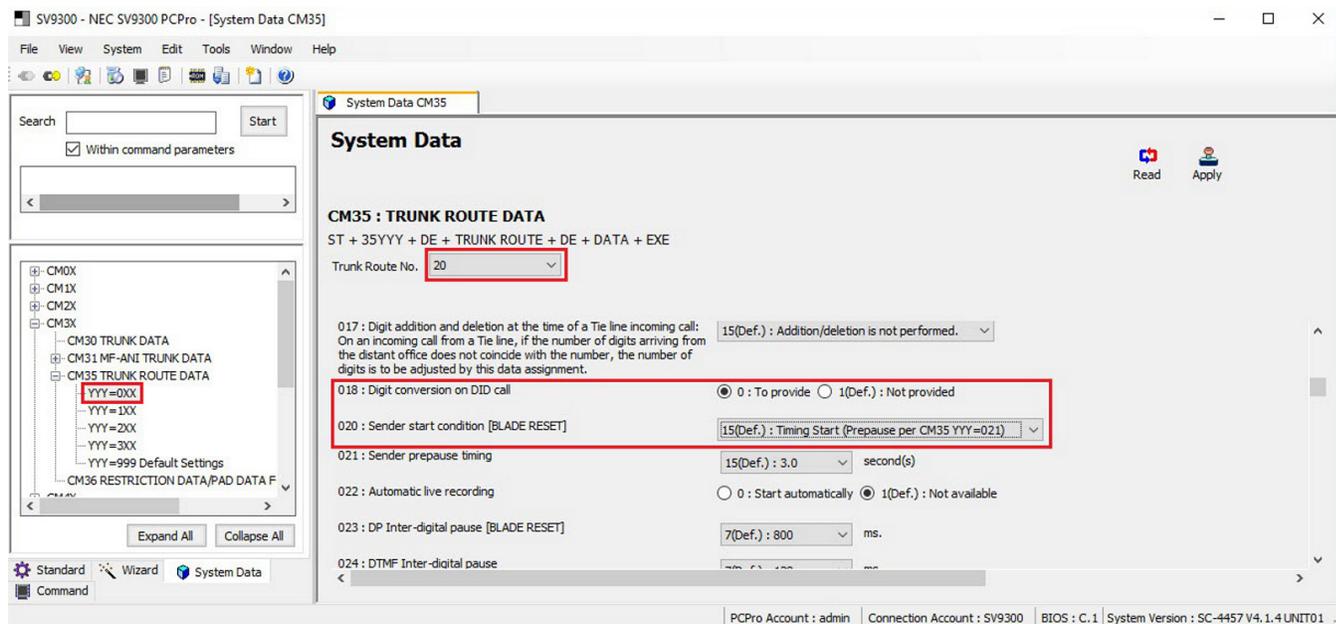
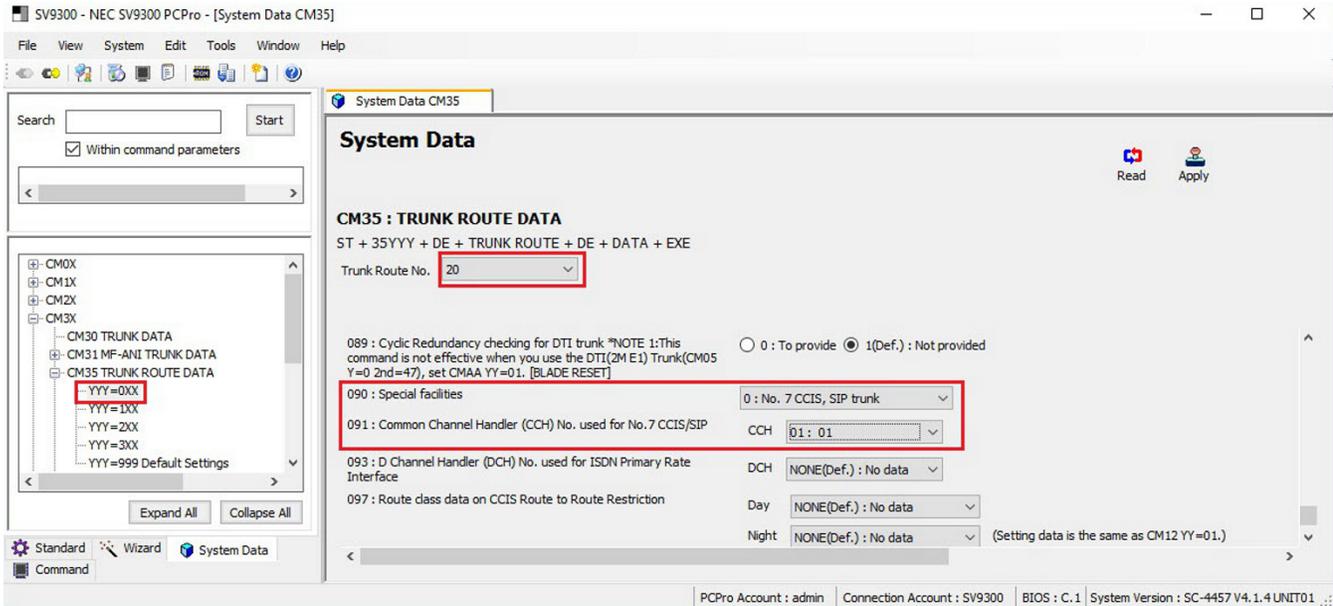


Figure 10 CM 35 SIP Trunk Route Settings (continued)

1. Select the **Trunk Route Number** assigned to voice channels and click the **Read** button to get current data settings.
2. **YYY=018** Select **0** for DID digit conversion.  
**YYY=020** Select **15** for SIP trunk service.
3. Click **Apply**.

**Command Line Example:**

CM 35018>01>0 (SIP Trunk Route Data: Provide DID Digit Service)  
 CM 35020>01>15 (SIP Trunk Route Data: Provide SIP Service)



**Figure 11 CM 35 SIP Trunk Route Settings (continued)**

1. Select the **Trunk Route Number** assigned to voice channels and click the **Read** button to get current data settings.
2. **YYY=090** Select **0** for SIP trunk service.  
**YYY=091** Select **CCH** used for SIP trunk.
  -  *CCH 00 should not be assigned for SIP trunk; P-P CCIS must used CCH 00.*
  -  *Assign a different CCH to each SIP trunk server voice route.*
3. Click **Apply**.

**Command Line Example:**

CM 35090>01>0 (SIP Trunk Route Data: Provide SIP Service)  
 CM 35091>01>01 (SIP Trunk Route Data: Assign CCH Number)

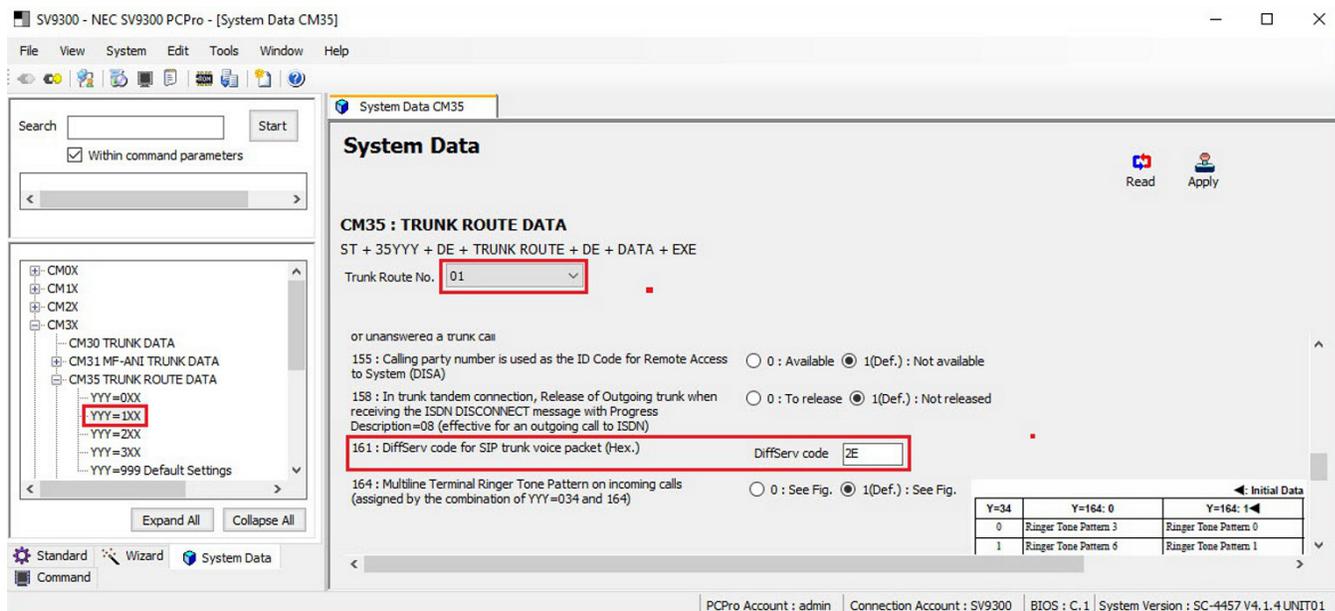


Figure 12 CM 35 SIP Trunk Route Settings (continued)

1. Select the **Trunk Route Number** assigned to voice channels and click the **Read** button to get current data settings.
2. **YYY=161** Enter DiffServ code in hexadecimal for SIP trunk voice packets (RTP stream).

**Example:** 2E = Expedited Forwarding

3. Click **Apply**.

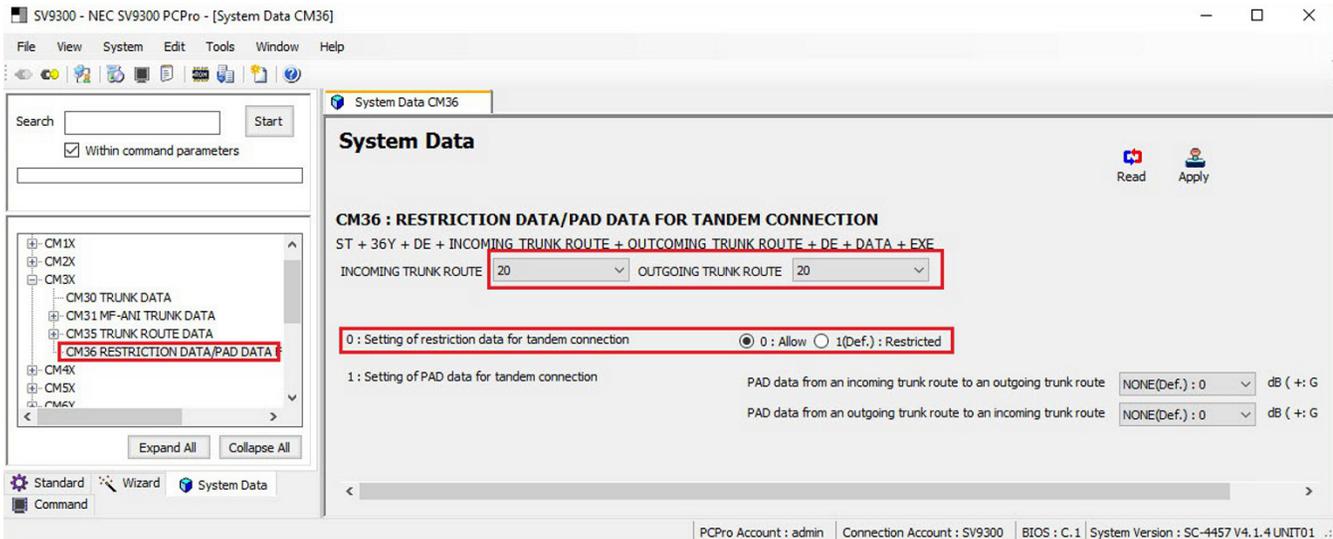
**Command Line Example:**

CM 35161>01>2E

(SIP Trunk Route Data: SIP Control QoS DiffServ EF)

### 3.7 Route to Route Connection Settings

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



**Figure 13 CM 36 Route to Route Connection Settings**

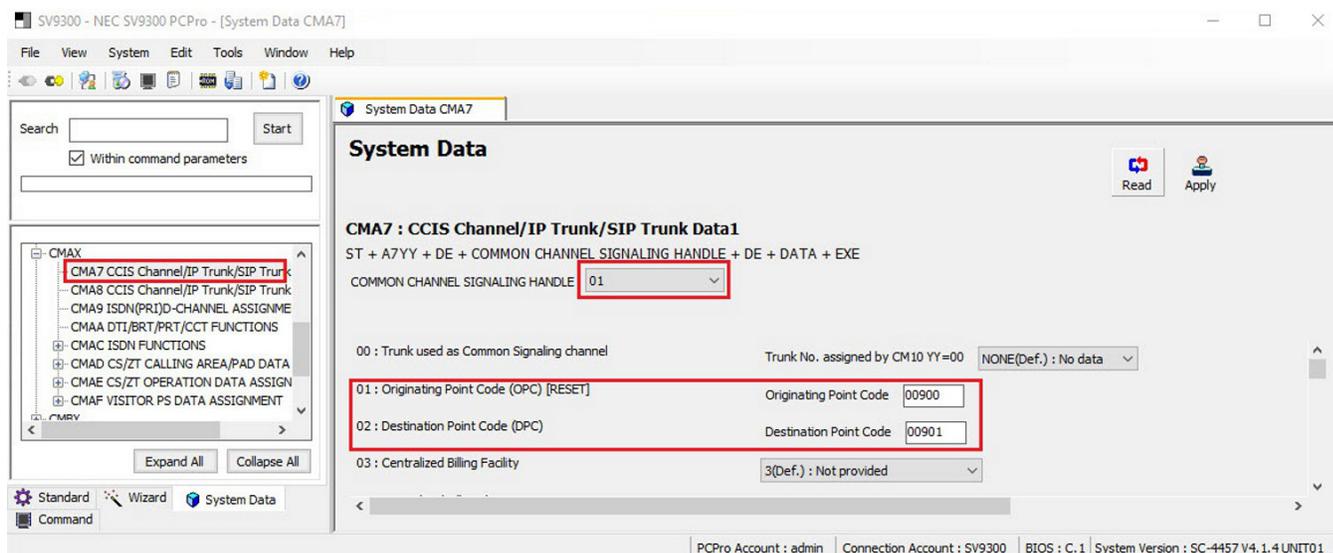
1. Select **Incoming Trunk Route**.
2. Select **Outgoing Trunk Route** and click the **Read** button to get current data settings.
3. Select **0** to allow route to route connection.
  -  *Allow route to route connection (i.e. SIP route to PRI route, PRI route to SIP route, and SIP route to SIP route).*
4. Click **Apply**.

**Command Line Example:**

CM 360>0101>0 (Route to Route Connection)

## 3.8 SIP Trunk Control Channel Settings

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



**Figure 14 CM A7 SIP Trunk Control Channel Settings**

1. Select **CCH** assigned to SIP trunk and click the **Read** button to get current data settings.
2. **YY=01** Assign an arbitrary **Originating Point Code**.  
*The same originating point code can be used for each SIP trunk server.*
3. **YY=02** Assign an arbitrary **Destination Point Code**.  
*Different destination point code must be used for each SIP trunk server.*
4. Click **Apply**.

### Command Line Example:

```
CM A701>01>00900           (Arbitrary Origination Point Code)
CM A702>01>00901           (Arbitrary Destination Point Code)
```

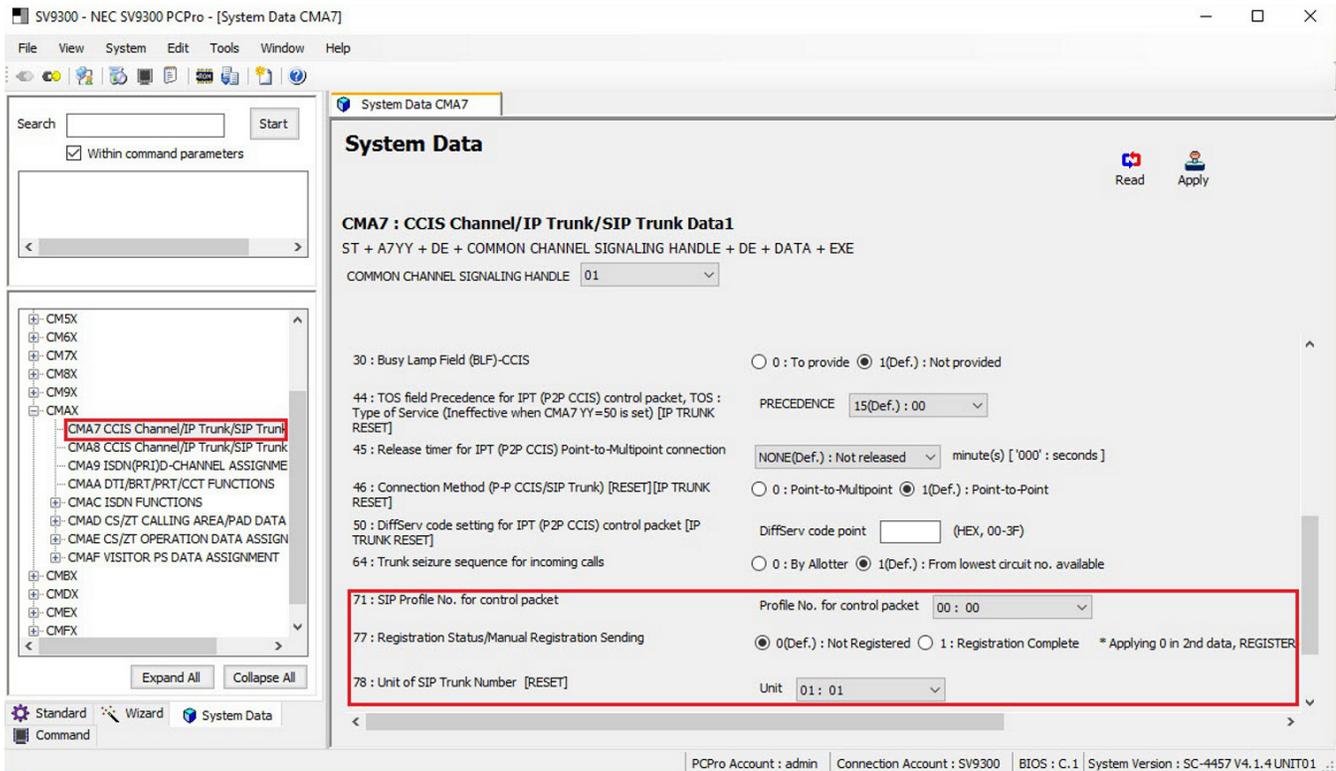


Figure 15 CM A7 SIP Trunk Control Channel Settings (continued)

1. Select **CCH** assigned to SIP trunk and click the **Read** button to get current data settings.
2. **YY=71** Select an unused **SIP Trunk Profile Number**.
3. **YY=77** Select this to send a manual registration.
  -  *This setting is not applicable for this carrier test leave at default.*
4. **YY=78** Select **Unit No.** accommodating SIP trunk channels.
5. Click **Apply**.

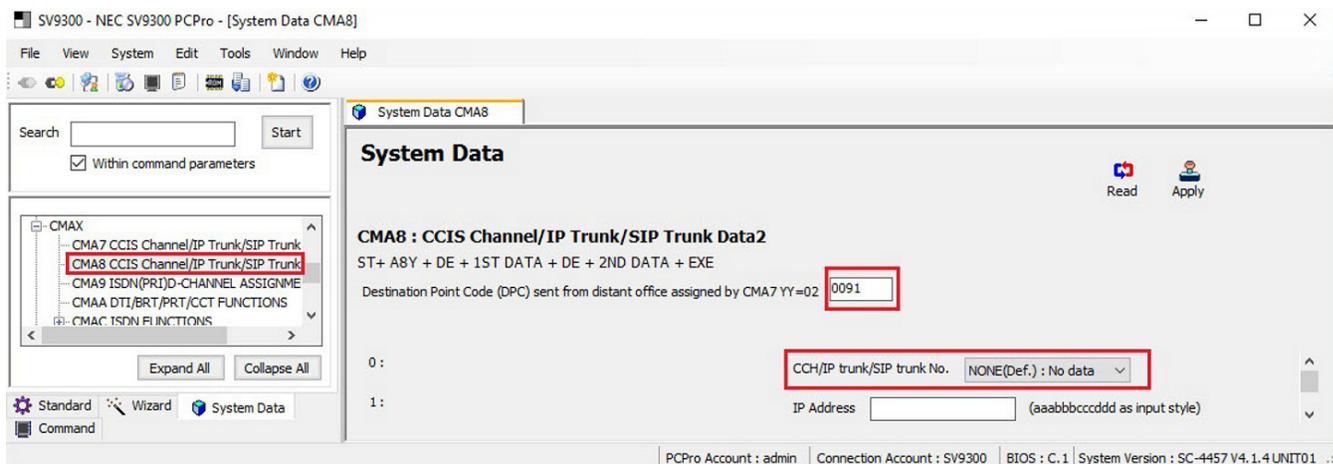
**Command Line Example:**

```

CM A771>01>00          (SIP Trunk Profile 00)
CM A777>01>0          (Sends a manual registration)
CM A778>01>01        (Main Site Unit 01)
  
```

### 3.9 SIP Trunk Destination Point Code Settings

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



**Figure 16 CM A8 SIP Trunk Destination Point Code Settings**

1. Enter **Destination Point Code** assigned by CMA7 YY=02 and click the **Read** button to get current data settings.
2. **Y=0** Select **CCH** assigned to destination point code in CMA7 YY=02.
3. Click **Apply**.

**Command Line Example:**

CM A80>00401>01

(Destination Point Code 00401 & CCH 01)

### 3.10 SIP Trunk Profile Settings

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

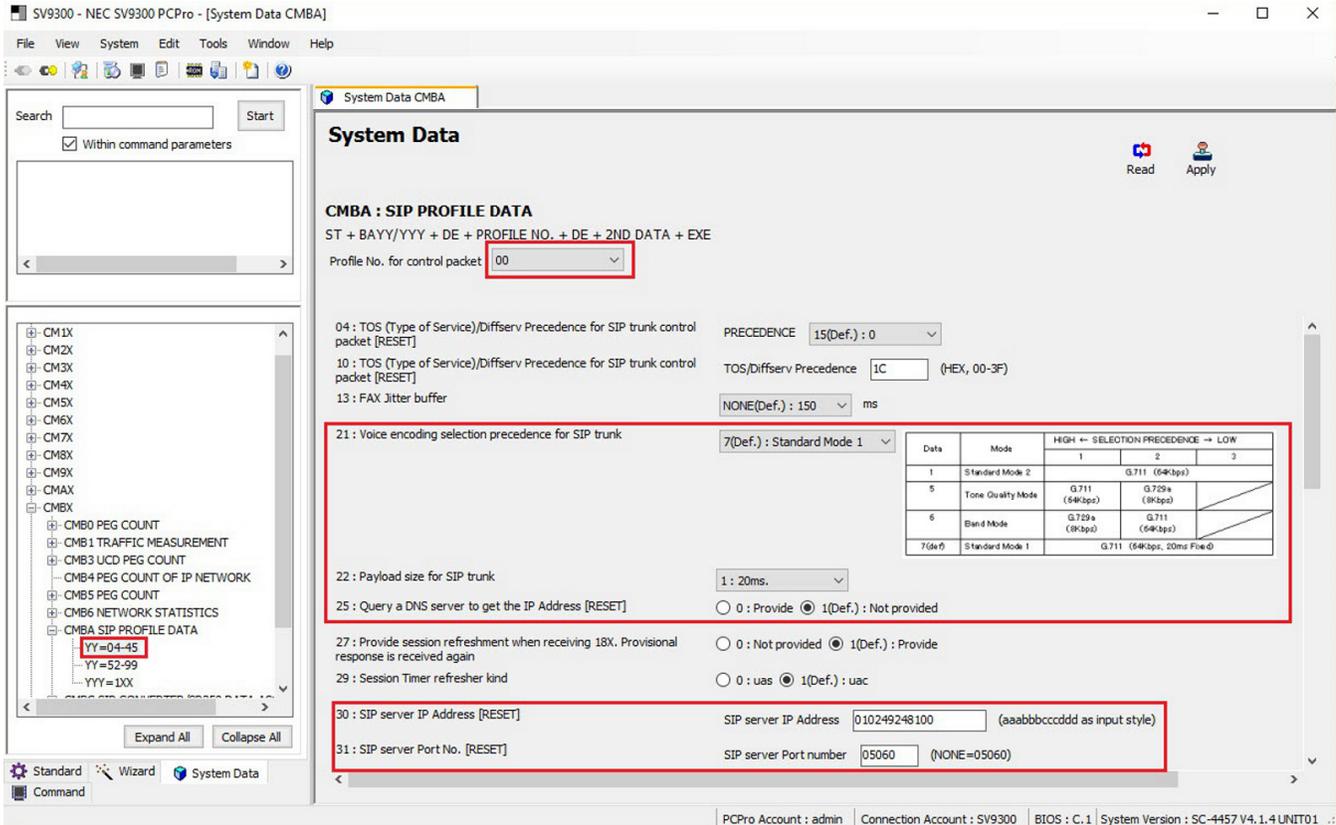


Figure 17 CM BA SIP Trunk Profile Settings

1. Select **SIP Trunk Profile Number** assigned by CM35 **YYY=091** and click the **Read** button to get current data settings.
2. **YY=04/10** Enter ToS/DiffServ code in hexadecimal for SIP trunk control (SIP packets). Vendor will advise if this setting is required.
3. **YY=21** Select SIP trunk **CODEC List**.  
**YY=22** Select SIP trunk **Payload Size**.
4. **YY=25** Select DNS server query option.
5. **YY=30 (This setting will not be used for Spectrum Enterprise.)** Enter SIP server **IP address** when not providing DNS server query.  
**YY=31** Enter SIP trunk server port. Assign port 05060 to use port 5060.

6. Click **Apply**.

**Command Line Example: DiffServ AF32/No DNS Query/Programmable CODEC List/20ms payload/Port 5060**

CM BA04>00>15 (Default: QoS assigned by CM BA YY=10)  
 CM BA10>00>None (DiffServ AF32)  
 CM BA21>00>7 (Programmable CODEC List)  
 CM BA22>00>3 (40ms. Payload)  
 CM BA25>00>0 (DNS Query is provided)  
 CM BA30>00>None (Example: SIP Server IP Address)  
 CM BA31>00>05060 (SIP Server Port 5060)

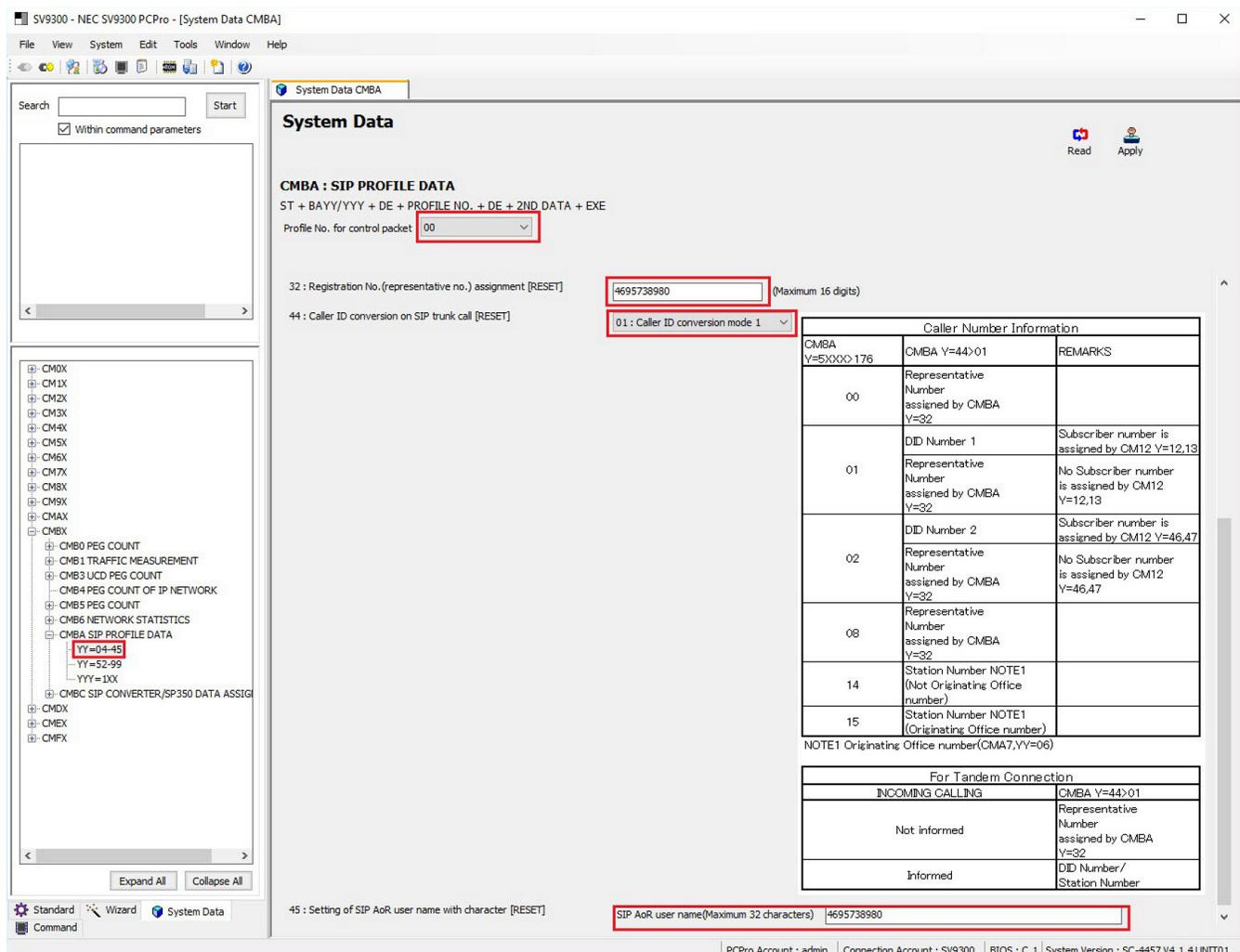


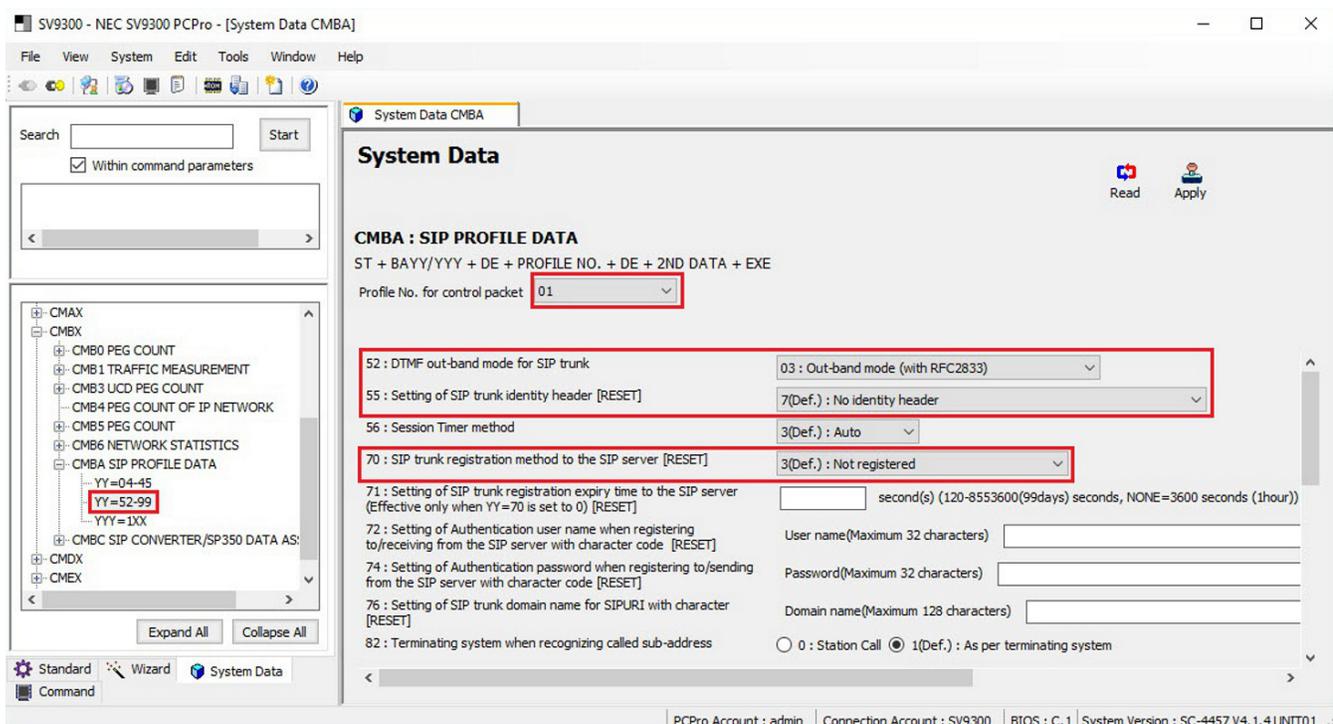
Figure 18 CM BA SIP Trunk Profile Settings (continued)

1. Select **SIP Trunk Profile Number** assigned by CM35 YYY=091 and click the **Read** button to get current data settings.
2. **YY=32** Enter SIP account main DID number.
3. **YY=45** Enter SIP account user name.
4. Click **Apply**.

 *Spectrum Enterprise will provide the information for these settings.*

#### Command Line Example: Main DID 1234567890

CM BA32>00>1234567890                      (Main DID Number)  
 CM BA45>00>                                      Not required for Spectrum Enterprise



**Figure 19 CM BA SIP Trunk Profile Settings (continued)**

1. Select **SIP Trunk Profile Number** assigned by CM35 YYY=091 and click the **Read** button to get current data settings.
2. **YY=53** Select 03 for out of band DTMF (RFC2833).  
**YY=55** Select 7 for No identity header.
3. **YY=70** Select SIP registration method.

4. **YY=72** Enter SIP trunk account user name.
- YY=74** Enter SIP trunk account password.
- YY=76** Enter SIP trunk domain name when querying DNS server.

 *NEC is unable to support best effort faxing do to unreliable fax communications.*

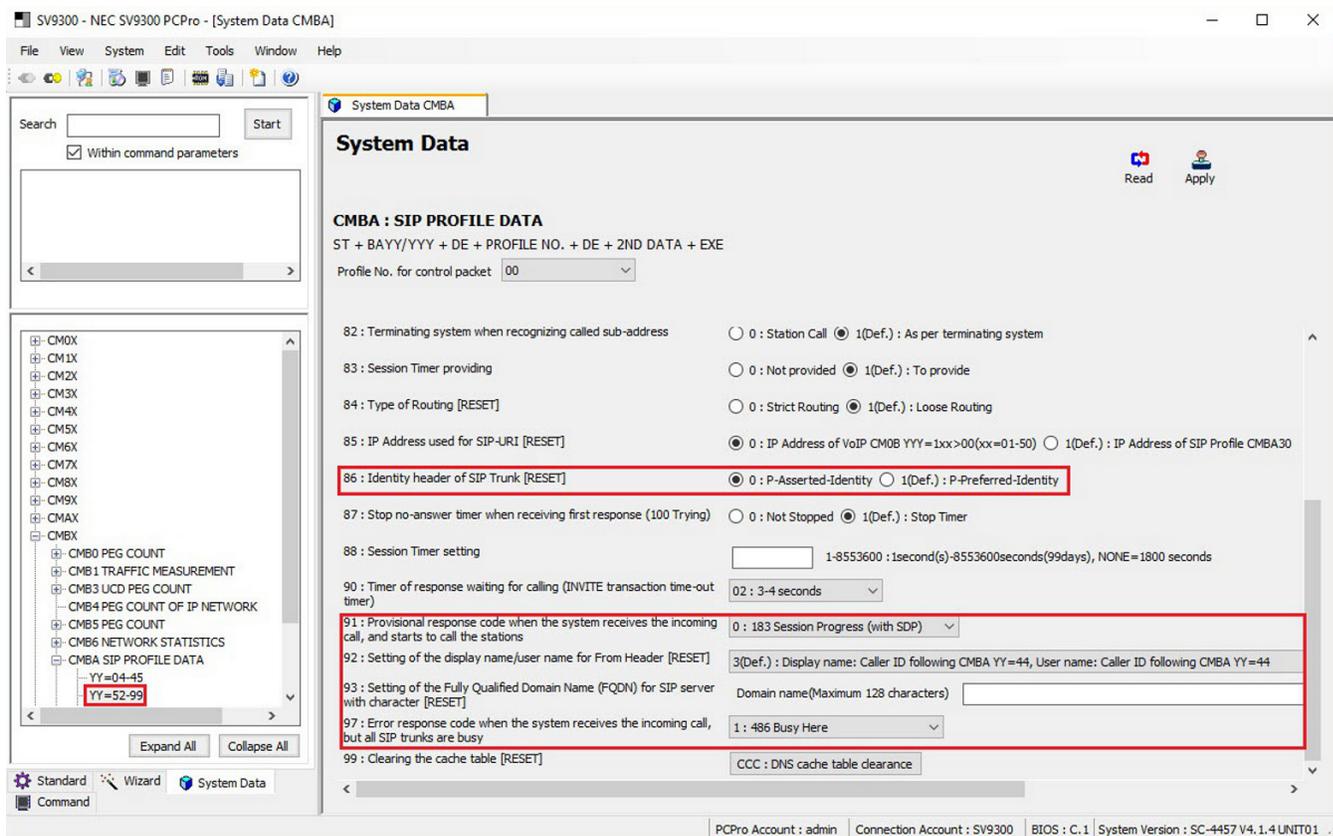
5. Click **Apply**.

#### Command Line Example:

```

CM BA53>00>03                (Out of Band DTMF RFC2833)
CM BA55>00>7                 (No Identity Header)
CM BA70>00>0                 (Registration Required)
CM BA72>00>1234567890       (Representative number from BA32)
CM BA74>00>1234567887654321 (SIP Trunk Account Password)
CM BA76>00>sip220.edgecommunications.com (SIP Trunk Domain Name)

```



**Figure 20 CM BA SIP Trunk Profile Settings (continued)**

1. Select **SIP Trunk Profile Number** assigned by CM35 YYY=091 and click the **Read** button to get current data settings.

2. **YY=86** Select identity header format.
3. **YY=90** Set SIP INVITE response timer to 32 seconds (default).  
**YY=91** Select SIP INVITE response for early media.  
**YY=92** Select From Header format.  
**YY=93** Enter SIP trunk account domain when querying DNS server.  
**YY=97** Select response message when all trunks are busy.
4. Click **Apply**.

#### Command Line Example:

CM BA86>00>1 (P-Preferred-Identity)  
 CM BA90>00>3 (SIP Response Timer 32 Seconds)  
 CM BA91>00>7 (SIP INVITE response for early media: 180 Ringing w/o SDP)  
 CM BA92>00>3 (From Header Format)  
 CM BA93>00>sip220.edgecommunications.com (SIP Trunk Account Domain)  
 CM BA97>00>7 (SIP response when all trunks are busy: 503 service unavailable)

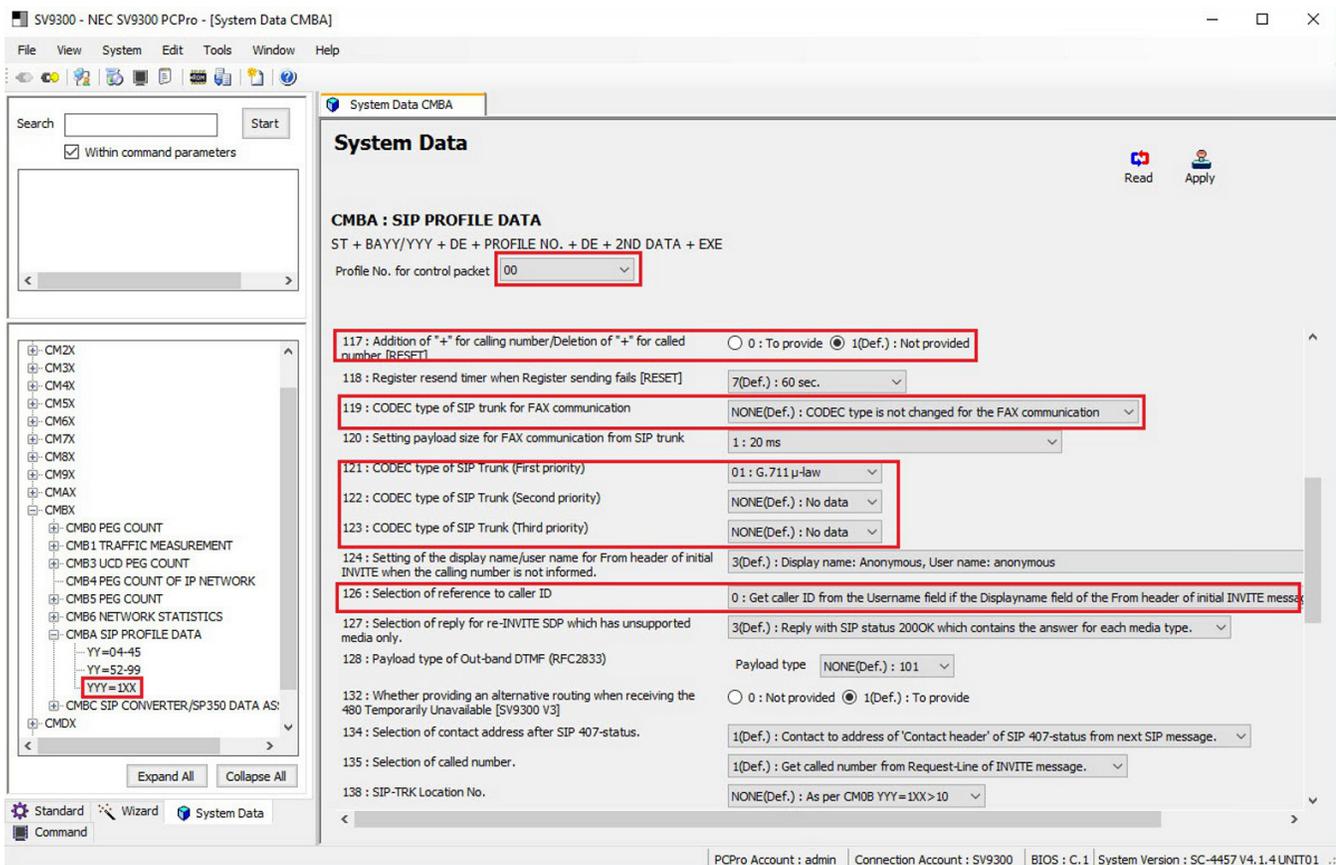


Figure 21 CM BA SIP Trunk Profile Settings (continued)

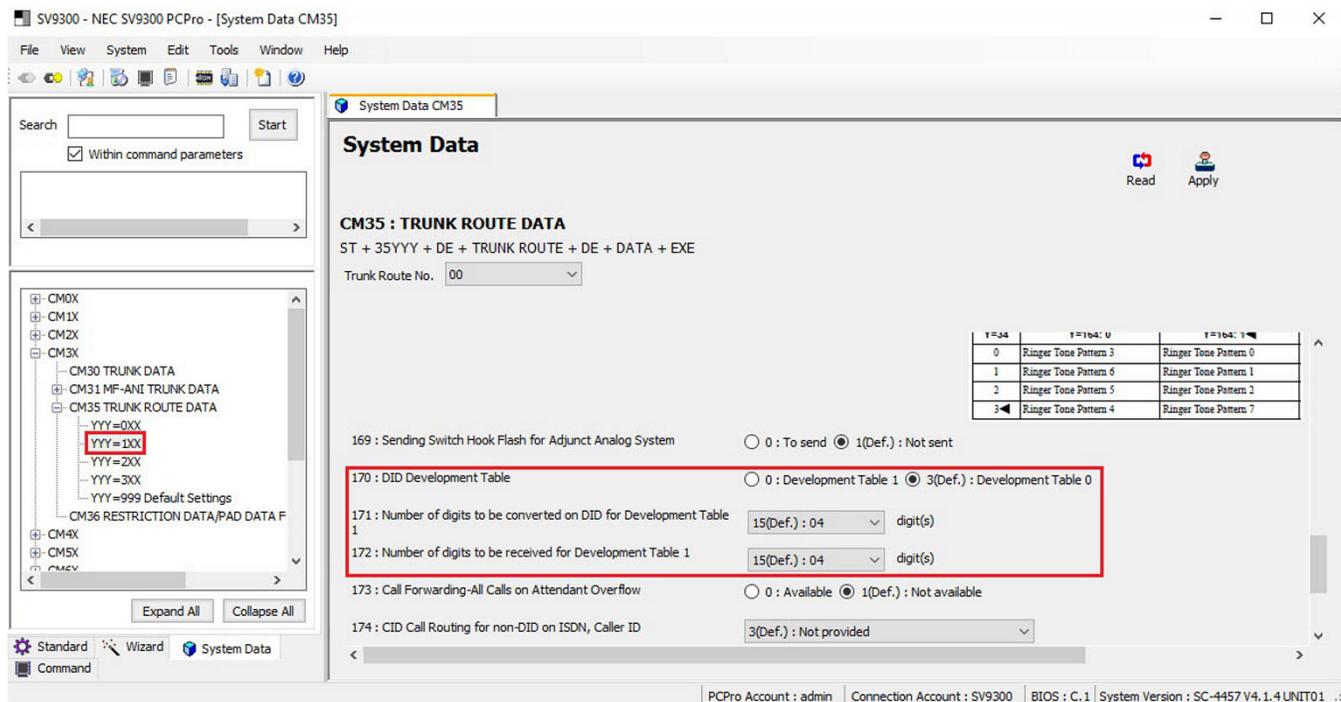
1. Select **SIP Trunk Profile Number** assigned by CM35 YYY=091 and click the **Read** button to get current data settings.
  2. **YY=117** Set + digit addition/deletion dialing.
  3. **YY=119** Only set when using T.38 faxing.
  4. **YY=121~123** Set desired CODEC list when using programmable list. (CM BA YY=21)
  5. **YY=126** Select **0** to receive CID from the username field if the display name field is blank in the initial invite.
  6. **YY=135** Select **0** to receive called party number from the 'to header' SIP invite. Change only if requested, otherwise leave at default.
-  *This setting is not applicable for this carrier test leave at default.*
7. Click **Apply**.

**Command Line Example:**

CM BA117>00>1 Set + digit addition/deletion dialing	(Default: Not provided)
CM BA119>00>NONE	(Default: G.711 Pass-Through Fax. Only set when using T.38 Fax)
CM BA121>00>NONE	(CODEC List First Priority: G.711)
CM BA122>00>NONE	(CODEC List First Priority: G.729a)
CM BA126>00>0	(Receiving Caller ID Reference)
CM BA135>00>1	(Called Number Reference Location)

### 3.11 DID Digit Conversion Settings

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



**Figure 22 CM 35 YYY=170~172 DID Digit Conversion Settings**

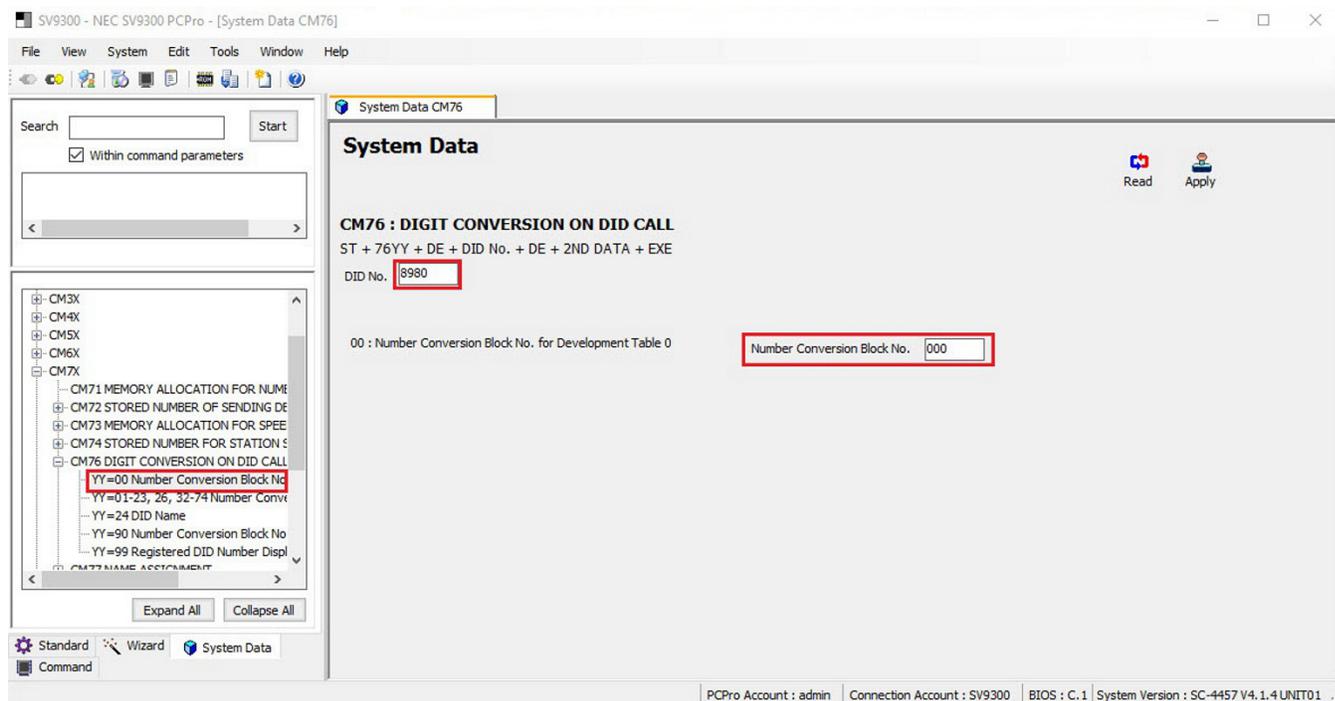
1. Select the Trunk Route Number assigned to voice channels and click the **Read** button to get current data settings.
2. **YYY=170** Select **0** to use DID Development Table 1.  
**YYY=171** Select the number of digits to be converted.  
**YYY=172** Select the number of digits received.
3. Click **Apply**.

**Command Line Example:**

```

CM 35170>01>0                (DID Development Table 1)
CM 35171>01>15              (Default: 04 Digits)
CM 35172>01>15              (Default: 04 Digits)

```



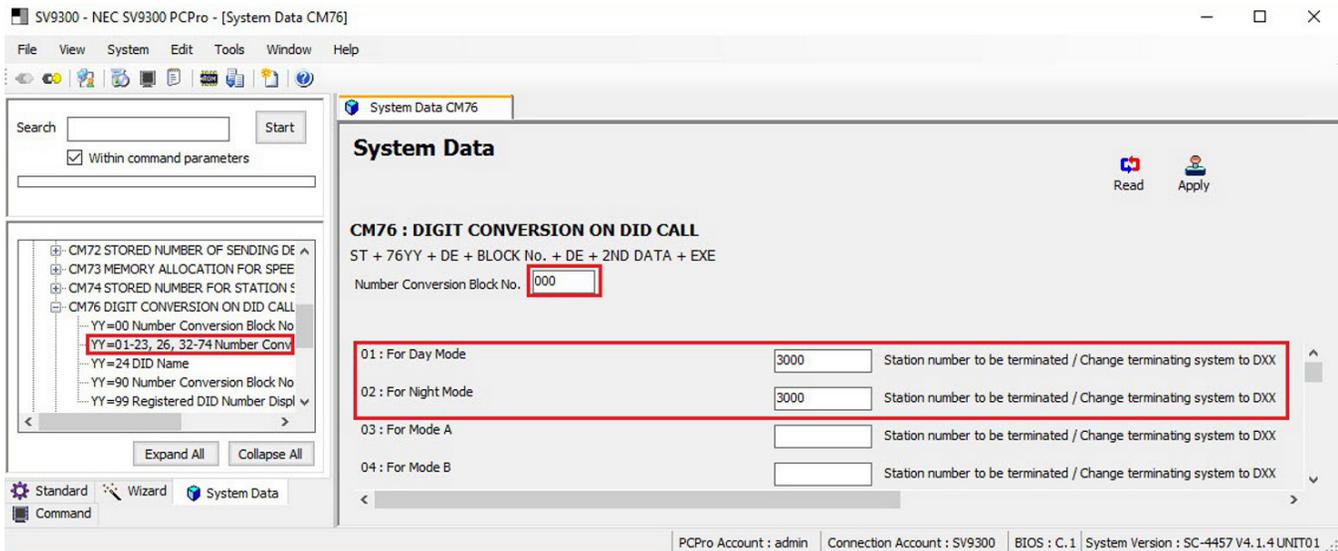
**Figure 23 CM 7690 DID Digit Conversion Settings (continued)**

1. Enter DID digits to be converted and click the **Read** button to get current data settings.
2. Enter DID conversion block number.
3. Click **Apply**.

**Command Line Example: DID 214-555-4567**

CM 7690>4567>000

(DID 214-555-4567/Conversion Block 000)



**Figure 24 CM 76 DID Digit Conversion Settings (continued)**

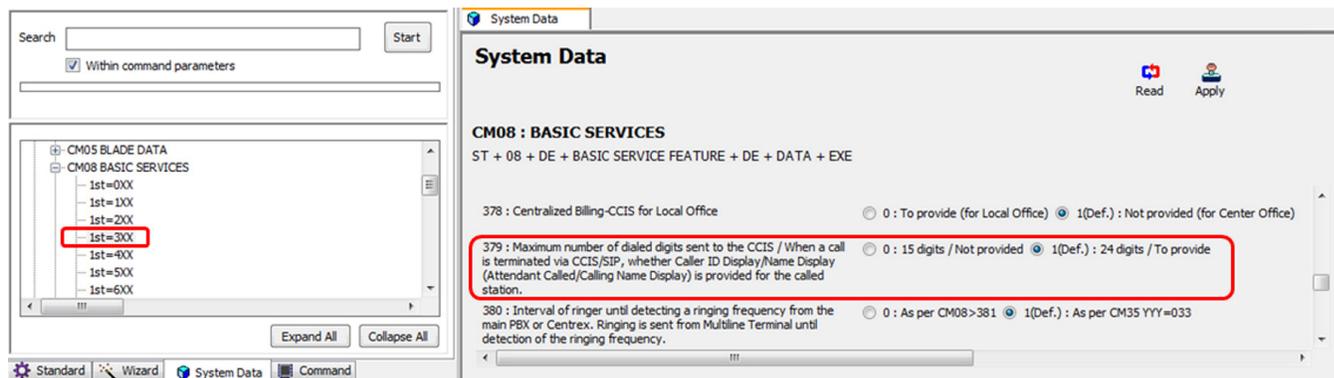
1. Enter DID conversion block number and click the **Read** button to get current data settings.
2. **YY=01~04** Enter DID destination for the required system modes.
3. Click **Apply**.

**Command Line Example: Day Mode/Destination Stn. 3000**

CM 7601>000>3000 (Conversion Block 000/Destination Stn. 3000)

## 3.12 Caller ID Display

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



**Figure 25 CM 08 Basic Services – Caller ID Display**

1. Click the **Read** button to get the current settings.
2. **FD=379** Select **1** to provide Caller ID display.
3. Click **Apply**.

**Command Line Example:**

CM 08>379>1

(Default: Provide Caller ID Display)

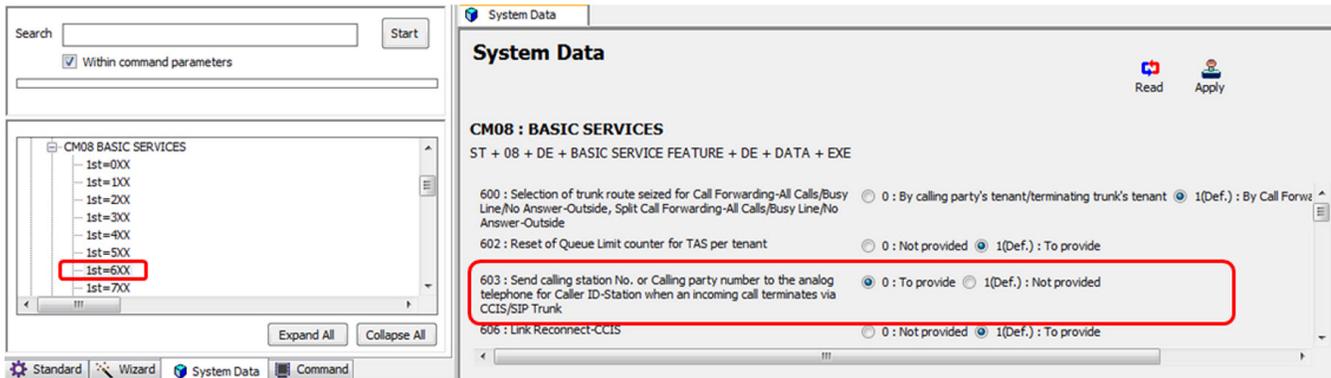


Figure 26 CM 08 Basic Services – Caller ID Display (continued)

1. Click the **Read** button to get the current settings.
2. **FD=603** Select **0** to provide Caller ID display.
3. Click **Apply**.

**Command Line Example:**

CM 08>603>0

(Caller ID Display on Analog Terminal)

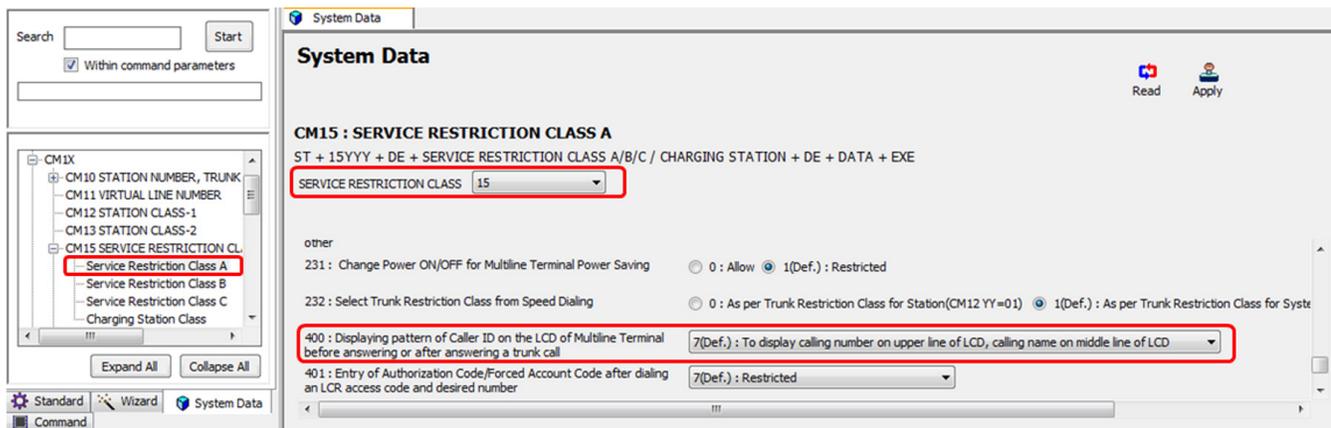
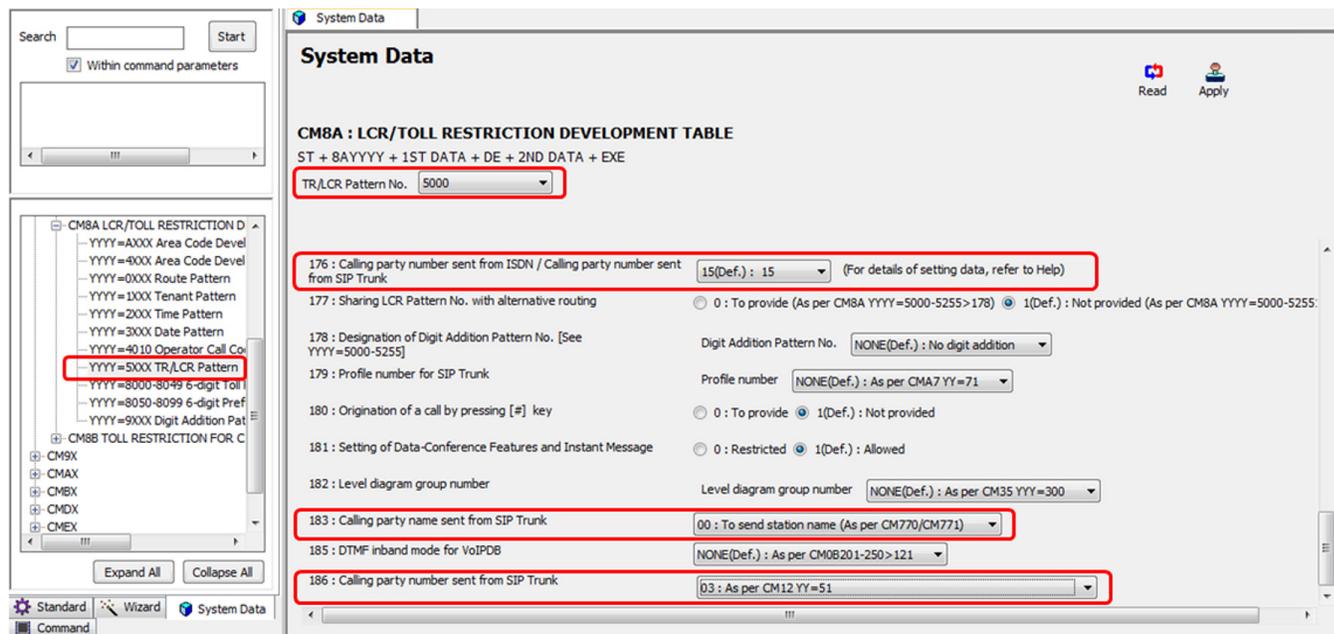


Figure 27 CM 15 Service Restriction Class A – Caller ID Display (continued)

1. Select station **Service Restriction Class A** and click **Read** to get the current data settings.
2. **YYY=400** Select **1** or **7** to display both name and number simultaneously.

3. Click **Apply**.**Command Line Example:**

CM 15400>15>7 (Default: Caller ID Number on Upper Line/Name on Middle Line)



**Figure 28 CM 8A LCR Development Table – Caller ID Display (continued)**

1. Select station **SIP Trunk LCR Pattern No.** and click **Read** to get the current data settings.
2. **FD=176** Select **15** to follow CM 8A5xxx>186 setting.
3. **FD=183** Select **00** to send calling party name.
4. **FD=186** Select calling party number sending option.
5. Click **Apply**.

**Command Line Example:**

CM 8A5000>176>15 (Default: Follow CM 8Axxx>186 Setting)

CM 8A5000>183>00 (Send Calling Party Name Assigned to CM77 Y=1)

CM 8A5000>186>03 (Send Calling Party Number Assigned to CM12 YY=51)

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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 2 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 an 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 2 Troubleshooting Guide

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

**Command Line Example:**

CM 0B101>00>172.24.142.55	(Unit 01 VoIP Address)
CM 0B101>01>255.255.255.0	(Unit 01 VoIP Subnet)
CM 0B101>02>172.24.142.1	(Unit 01 VoIP Default GW)
CM 0B101>10>NONE	(Default: Location 00)
CM 0B101>36>NONE	(Default: SIP Trunk Port 5060)
CM 0B101>60>151.164.1.8	(Unit 01 Primary DNS Server Address)
CM 0B101>61>151.164.11.201	(Unit 01 Secondary DNS Server Address)
CM 0B101>70>66.137.132.162	(Unit 01 Global IP Address)
CM 0B201>00>172.24.142.56	(Unit 01 VoIP IPPAD Address)
CM 0B101>10>32	(Unit 01 VoIP IPPAD Channels)
CM 0B101>50>1	(Unit 01 Allow Fax over IP)
CM 1003>01000>D001	(Unit 01 SIP Trunk Channel 1)
CM 1003>01001>D002	(Unit 01 SIP Trunk Channel 2)
CM 1003>01002>D003	(Unit 01 SIP Trunk Channel 3)
CM 1003>01003>D004	(Unit 01 SIP Trunk Channel 4)
CM 3000>001>01	(Voice Trunk Route Number 01)
CM 3000>002>01	(Voice Trunk Route Number 01)
CM 3000>003>01	(Voice Trunk Route Number 01)
CM 3000>004>01	(Voice Trunk Route Number 01)
CM 3035>001>001	(Assign CIC to Channel 1)
CM 3035>002>002	(Assign CIC to Channel 2)
CM 3035>003>003	(Assign CIC to Channel 3)
CM 3035>004>004	(Assign CIC to Channel 4)
CM 35000>01>00	(SIP Trunk Route Data: Provide SIP Service)
CM 35004>01>2	(SIP Trunk Route Data: Provide SIP Service)
CM 35009>01>03	(SIP Trunk Route Data: Provide SIP Service)
CM 35018>01>0	(SIP Trunk Route Data: Provide DID Digit Conversion)
CM 35020>01>00	(SIP Trunk Route Data: Provide SIP Service)
CM 35090>01>0	(SIP Trunk Route Data: Provide SIP Service)
CM 35091>01>01	(SIP Trunk Route Data: Assign CCH Number)
CM 35161>01>2E	(SIP Trunk Route Data: SIP Control QoS DiffServ EF)
CM 35170>01>0	(DID Development Table 1)
CM 35171>01>15	(Default: 04 Digits)
CM 35172>01>15	(Default: 04 Digits)
CM 360>0101>0	(Route to Route Connection)
CM A701>01>00400	(Arbitrary Origination Point Code)
CM A702>01>00401	(Arbitrary Destination Point Code)
CM A771>01>00	(Assign SIP Trunk Profile Number)
CM A778>01>01	(Assign SV9300 Unit Number with SIP Trunk Channels)

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CM A80>00401>01	(Destination Point Code 00401 & CCH 01)
CM BA04>00>15	(Default: QoS assigned by CM BA YY=10)
CM BA10>00>1C	(DiffServ AF32)
CM BA21>00>0	(Programmable CODEC List)
CM BA22>00>1	(20ms. payload)
CM BA25>00>1	(Default: DNS query not provided)
CM BA30>00>172.245.36.25	(Example: SIP server IP address)
CM BA31>00>05060	(SIP server port 5060)
CM BA32>00>2145551212	(Main DID Number)
CM BA45>00>SV9300	(SIP Account User Name)
CM BA53>00>03	(Out of Band DTMF RFC2833)
CM BA55>00>1	(SIP-URL Identity Header)
CM BA70>00>0	(Registration Required)
CM BA72>00>SV9300	(SIP trunk account user name)
CM BA74>00>Password	(SIP trunk account password)
CM BA83>00>0	(Session timer not provided)
CM BA86>00>0	(SIP Identity Header Format)
CM BA90>00>01	(SIP Response Timer 1-2 Seconds)
CM BA91>00>1	(SIP INVITE response for early media: 180 Ringing w/ SDP)
CM BA92>00>2	(From Header Format)
CM BA97>00>1	(SIP response when all trunks are busy: 488 Busy Here)
CM BA117>00>1	(Default: + Digit Addition/Deletion Not Provided)
CM BA119>00>NONE	(Default: G.711 Pass-Through Fax. Only set when using T.38 Fax)
CM BA121>00>01	(CODEC List First Priority: G.711)
CM BA122>00>04	(CODEC List First Priority: G.729a)
CM BA126>00>0	(Receiving Caller ID Reference)
CM BA135>00>0	(Called Number Reference Location)
CM BA138>00>10	(SIP Trunk Location Number: Used for T.38 Fax)
CM BA139>00>066137132001	(Global IP Address)
CM BA159>00>3	(Default: Calling Party Number Sending Option)
CM BA160>00>01	(Tandem Conversion Mode 1)
CM 6720>0010>4	(Programmable Fax List: Only used for T.38 Fax)
CM 6720>1000>4	(Programmable Fax List: Only used for T.38 Fax)
CM 6720>1010>4	(Programmable Fax List: Only used for T.38 Fax)
CM 6721>00>06	(T.38 Fax)
CM 6721>01>02	(T.38 20ms Payload Size)
CM 6721>09>NONE	(Default: T.38 150ms jitter buffer)
CM 6721>10>3	(9600 T.38 fax transmission speed)
CM 6721>15>NONE	(Default: T.38 resend control data 3 times)
CM 6721>16>NONE	(Default: T.38 resend image data 0 times)
CM 6721>19>NONE	(Default: T.38 fax version)
CM 7690>4567>000	(DID 214-555-4567/Conversion Block 000)

CM 7601>000>2000	(Conversion Block 000/Destination Stn.2000)
CM 08>379>1	(Default: Provide Caller ID Display)
CM 08>603>0	(Caller ID Display on Analog Terminal)
CM 15400>15>7	(Default: Caller ID Number on Upper Line/ Name on Middle Line)
CM 8A5000>176>15	(Default: Follow CM 8A5xxx>186 Setting)
CM 8A5000>183>00	(Send Calling Party Name Assigned To CM77 Y=1)
CM 8A5000>186>03	(Send Calling Party Number Assigned to CM12 YY=51)