

Answer Supervision

Introduction	2
Types of Answer Supervision	2
ISDN/PRI (T1/E1 lines only) - Digital Tenor and CMS Only.....	2
CAS-E&M Signaling (T1/E1 lines only) - Digital Tenor and CMS Only.....	2
Loop-Start Reverse Battery – Digital and Analog Tenors and CMS	2
Loop-Start with Voice Detection Answer Supervision (VDAS) – Digital and Analog Tenors	3
Configuring Answer Supervision.....	3
Reverse Battery Supervision.....	3
Voice Detection Answer Supervision	4
Answer Delay	4
Progress Tone	5
Answer Supervision Options	5
Quick Command Reference Table	7
1G Command List.....	7
Trunk Group Commands.....	7
DSP Commands.....	8
2G Command List.....	9
CASSignalingGroup-line	9

NOTE

- **1G:** When you see configuration parameters labeled as 1G, you will know that they are based on Tenor software version P4-2-20. If you have a lower version of software, then some of the commands may not be available or may be named differently. Check with your CLI guide to verify this. This document does not address the A200.
- **2G:** These configuration parameters apply to the Tenor AX, AS, DX, and CMS.
- **TCM:** Indicates a procedure in the *Tenor Configuration Manager* software.

Introduction

This document describes the types of answer supervision the Tenor can recognize, based on the different types of signaling, and how to configure the Tenor.

This document is designed to help explain and resolve issues associated with a lack of answer supervision from a switch or PSTN provider that could result in incorrect billing for termination calls.

Types of Answer Supervision

There are several ways to provide answer supervision. Many of them depend on the type of signaling that is used between the gateway/Tenor and the PSTN provider. Below is a list of the signaling and the type of answer supervision. Keep in mind that answer supervision is mostly done at the termination side of a call.

ISDN/PRI (T1/E1 lines only) - Digital Tenor and CMS Only

ISDN signaling, as defined by the ITU, provides full answer supervision. The PSTN signals back to the gateway when the party has answered the phone. Additionally, PSTN providers give other call progress indications, using standard ISDN messaging and disconnect cause codes such as User Busy, Number Changed, etc. All of these indications must be provided by the PSTN when the signaling is set to ISDN. When the termination Tenor is configured for ISDN signaling, then there are no other configuration parameters on the Tenor to set in order for the Tenor to receive proper answer supervision from the PSTN and pass this along to the call originator.

CAS-E&M Signaling (T1/E1 lines only) - Digital Tenor and CMS Only

This is another type of signaling that is only supported on T1 or E1 lines (Digital Tenor and CMS). In this case, the PSTN that the termination Tenor is connected to must provide clear answer supervision to the origination Tenor when the destination party answers the call. This is done through the A&B signaling bits, as described in the ITU specification for E&M signaling. When the termination Tenor is correctly configured to support E&M signaling, then there are no other configuration parameters required for answer supervision.

Loop-Start Reverse Battery – Digital and Analog Tenors and CMS

Reverse battery (also called reverse polarity) is when the PSTN provider reverses the polarity of the battery voltage, for both answer supervision and disconnect supervision. When configured to acknowledge reverse battery, the Tenor disconnects the line when it receives this signal from the PSTN. In order for the Tenor to support this type of disconnect supervision:

- **1G:** You must set the **cassignal** parameter in the PSTN to “5” for Loop Start Rev Battery (not available in analog Tenors whose serial number is less than 1000).
- **2G:** You must set the **signalingtype** to 2.
- **TCM:** You must go to *Circuit Configuration > Signaling Configuration > CAS Signaling Group* . On the General tab, select Loop Start, Reverse Battery from the Signaling Type drop-down box.

Loop-Start with Voice Detection Answer Supervision (VDAS) – Digital and Analog Tenors

Voice Detection-based answer supervision is a feature where the termination Tenor can be configured to “listen” on the line for different tones and voice. The Tenor sends a call out using loop start or loop start with forward disconnect signaling.

- If it detects voice, then it connects back to the originator and billing starts.
- If it does not detect voice, it does not connect immediately. This type of answer supervision is not 100% accurate. Any voice frequency is detected as a connect, including any intercept or recorded messages such as “the number you have dialed” This could lower your overall duration of calls if wrong number(s) are dialed.

When the termination Tenor is configured for this feature, it starts to monitor the line immediately once the call is sent out. First, it is looking for a ring-back tone or any type of busy tones. If it detects busy tones, it will not signal a connect*.

- **1G:** This feature only works if the signaling in the PSTN trunk group is set to either Loop Start (1) or Loop Start with Fwd Disconnect (6) and no other signaling type.
- **2G:** You must set the **signalingtype** in the CAS Signaling Group to 1 or 3.
- **TCM:** In the CAS Signaling Group window, General tab, select either Loop Start or Loop Start, Forward Disconnect from the Signaling Type drop-down box.

Configuring Answer Supervision

NOTE

After making the necessary changes, you must submit the configuration.

Reverse Battery Supervision

As described above, this is when the PSTN reverses the polarity of the line to signal that the call has been answered and when it is disconnected.

To configure for this type of supervision, first you must type the following.

1G: Quintum>config pstn 1 <Enter>

This will bring you to the first PSTN trunk group.

2G: config>cassg 1 <Enter>

This will bring you to the first channel-associated signaling group (where signaling type is configured).

TCM: You must go to *Circuit Configuration > Signaling Configuration > CAS Signaling Group* .

To set this Tenor to recognize a battery reversal disconnect, you must set the CAS Signaling to Loop Start Reverse Battery. You do this by issuing the following command.

1G: config pstntg 1# cassig 5 <Enter>

2G: config-CASSignalingGroup-1# set st 2 <Enter>

TCM: On the General tab, select Loop Start, Reverse Battery from the Signaling Type drop-down box.

The CAS Signaling is now set to Loop Start with Reverse Battery. When set this way, no other disconnect supervision is accepted. You may be able to configure other disconnect supervision methods through the CLI, such as disconnect tone, but only the reverse battery disconnect is recognized.

NOTE

Battery Reversal is available in all digital Tenors but only those analog Tenors that have a serial number higher than A002-0009FF.

Voice Detection Answer Supervision

As described earlier, this is when the call termination Tenor “listens” to the line to detect different tones and voice to determine if the call is answered.

In order to activate this, you will first need to type the following.

1G: Quintum>config pstn 1 <Enter>

This will bring you to the first PSTN trunk group.

2G: config>cassg 1 <Enter>

This will bring you to the first channel-associated signaling group (where signaling type is configured).

TCM: You must go to *Circuit Configuration > Signaling Configuration > CAS Signaling Group* .

To set this Tenor to use voice detection answer supervision, and recognize a disconnect tone, the CAS Signaling must stay at Loop Start or Loop Start with Fwd Disconnect only. Then you need to set the Supervision parameter to either Answer or Answer and Disconnect. The Supervision setting Answer and Disconnect will only work when cassignaling is set to Loop Start, and not for Loop Start with Fwd Disconnect. Supervision set to Answer will work for both types of signaling. Refer to our document on disconnect supervision on the Quintum website. Keep in mind that if you set Tone Based Supervision to Answer and Disconnect, then the signaling type MUST be Loop Start only.

1G: config pstntg 1# super 2 <Enter>

Sets the supervision to disconnect tone only.

2G: config-CASSignalingGroup-1# set tbs 1 <Enter>

Sets the tonebasedsupervision to disconnect only.

TCM: On the Signaling tab, select Disconnect Supervision from the Tone Based Supervision drop-down box.

or

1G: config pstntg 1# super 3 <Enter>

Sets the supervision to disconnect tone and answer.

2G: config-CASSignalingGroup-1# set tbs 3 <Enter>

Sets the tonebasedsupervision to both answer and disconnect supervision (default).

TCM: On the Signaling tab, select Answer & Disconnect Supervision from the Tone Based Supervision drop-down box.

Answer Delay

Additionally, when you set the supervision, you MUST set the answer delay. When supervision is disabled or set to disconnect only, the answer delay defines the number of seconds to wait after dialing out a call before issuing a connect. So this is not true answer supervision, but a delay in sending back a connect (for billing) a specific number of seconds. If a person answers the call, the call will not be billed until this timer expires.

When you are using voice detection answer supervision, then the answer delay determines the amount of time that the Tenor continues to listen on the line for voice. If this timer expires before detecting voice, the Tenor issues a connect for the call anyway.

For example, if supervision is set to answer and aisconnect, and you set the answer delay to 120 (120 seconds = 2 minutes), when the Tenor sends a call out of the PSTN port it looks to detect voice for 120 seconds. If it detects voice prior to this time expiring, the Tenor issues a connect for billing. If no one answers the phone and the caller remains on the line for over 120 seconds, then after 120 seconds has elapsed, the Tenor issues a connect anyway. The reason for this is to guard against the possibility that the Tenor was not able to detect voice even though someone answered.

1G: config pstntg 1# **answerdelay 120** <Enter>

2G: config-CASSignalingGroup-1# **set ad 120** <Enter>

TCM: You must go to *Circuit Configuration > Signaling Configuration > CAS Signaling Group* . In the Signaling tab, enter 120 in the Answer Delay field.

If you have supervision set to answer only or answer and disconnect, and leave answer delay set to 0, then when the Tenor sends a call out to the PSTN it signals a connect back immediately, as the timer of 0 has expired. Quintum recommends a minimum setting of 120 for this parameter.

Progress Tone

Also, you **MUST** have the progress tone set to No (default) for voice detection answer supervision to work. If this is set to Yes, then the Tenor will not be able to detect the answer as it will be providing false ring back on the line.

1G: config pstntg 1# **progtone 0** <Enter>

2G: config-TrunkCircuitRoutingGroup-1# **set pt 0** <Enter>

TCM: You must go to *Circuit Configuration > Signaling Configuration > Trunk Circuit Routing Group or Line Circuit Routing Group*. In the General tab, be sure there is no check in the Provide Progress Tone box.

NOTE

Progresstone found in the TCRG or LCRG must be set to 0 (disabled) for voice detection answer supervision to work correctly.

Answer Supervision Options

Finally, there is one more command that may be of use. To get to the correct prompt do the following.

1G: Quintum> **config dsp** <Enter>

This will bring you to the first PSTN trunk group.

2G: config>cassg 1 <Enter>

TCM: You must go to *Circuit Configuration > Signaling Configuration > CAS Signaling Group* .

Once there, you can adjust the sensitivity of the voice detection answer supervision as follows.

1G: config pstntg 1# **asoptions n <Enter>**

where n equals:

0 = default answer supervision algorithm

1 = reduced noise filtering at the beginning of the call

2 = Check for disconnect tone before declaring answer condition

3 = Enable both conditions 1 and 2

2G: The 2G answer supervision options are split into three enable/disable commands.

config- CASSignalingGroup -1# **set asms 1 <Enter>**

Enables Answer Supervision More Sensitive.

config- CASSignalingGroup -1# **set asda 1 <Enter>**

Enables Answer Supervision Delay Answer.

config- CASSignalingGroup -1# **set aslf 1 <Enter>**

Enables Answer Supervision Less Filter.

TCM: In the Signaling tab, place a check in the Answer Supervision Options boxes labeled More sensitive, Delay Answer, or Less Filter to enable.

In most cases, leaving the answer supervision options disabled should be sufficient. When you reduce filtering, there is a higher probability that false connects will occur. When you enable delay answer to check for disconnect tone, the Tenor will wait 1-2 seconds following a ring back to make sure that no busy signal is heard as a disconnect tone.

Quick Command Reference Table

Type	Description	Gen 1 PSTNTG Settings	Gen 2 cassig line
Reverse Battery	PSTN provider will change the polarity of the voltage/battery towards the Tenor to indicate when the called party has answered.	progtone 0 cassig 5 supervision 0 answerdelay 0	signalingtype 2 tonebasesuper 0 answerdelay 0
Voice Detection	Tenor will look to detect voice on the line to signal that the call is answered.	progtone 0 cassig 1 or 6 supervision 2 or 3 answerdelay => 60	signalingtype 1 or 3 tonebasesuper 2 or 3 answerdelay 60
Answer Delay Only	Tenor will delay sending the connect back the number of seconds configured.	progtone 0 or 1 cassig 1 or 6 supervision 0 answerdelay => 1	signalingtype 1 or 3 tonebasesuper 0 answerdelay > 1

1G Command List

Trunk Group Commands

cassignaling

Description Used to configure the type of channel associated signaling to be used for this trunk group. Also provides some forms of disconnect supervision.

Prompt Level config pstntg 1# or config pbxtg 1#

Syntax **cassignaling** or **cassig** {1 | 5 | 6}

Arguments

- 1** Loop Start signaling only.
- 5** Loop Start Reverse Battery.
- 6** Loop Start with Fwd Disconnect

Default 1 (Loop Start)

Availability All Tenor Releases.

Example config pstntg 1# **cassig 6**
Sets the pstn trunk group CAS signaling to Loop Start with Fwd Disconnect.

supervision

Description: Used to configure disconnect and answer supervision used for this trunk group.

Prompt Level config pstntg 1#

Syntax **supervision** or **super** {0 | 1 | 2 | 3}

Arguments **0** No Supervision set.
1 Disconnect Tone Supervision (cassig must be set to 1 only).
2 Answer Supervision (only available on PSTN trunk group).
3 Answer and Disconnect Supervision (cassig set to 1 - only on pstntg).

Default 0 (None)

Availability All Tenor Releases.

Example config pstntg 1# **super 1** (enables disconnect tone).

answerdelay

Description When supervision = 0, this determines the delay period (in seconds) before issuing a connect (not true answer supervision).

When supervision = 2 or 3, this determines the period (in seconds) to detect voice. If the time expires, a connect will be issued and billing will begin.

Prompt Level config pstntg 1#

Syntax **answerdelay** or **answer** {sec}

Arguments **sec** Number of seconds (0 – 360 max)

Default 0

Availability All Tenor Releases.

Example config pstntg 1# **answer 120**

DSP Commands

asoptions

Description Used to affect how the voice detection answer supervision will be used.

Prompt Level config dsp#

Syntax **asoption** or **asop** {0 | 1 | 2 | 3}

Arguments: **0** Default answer supervision option (recommended).
1 Reduced noise filtering at the beginning of the call.
2 Check for disconnect tones before declaring answer condition.
3 Enable both 1 and 2 options.

Default 0

Availability All Tenor Releases.

Example config dsp# **asopt 1**

2G Command List

CASSignalingGroup-line

SignalingType

Description Used to configure the type of channel associated signaling to be used for this trunk group. Also provides some forms of disconnect supervision.

Prompt Level config CASSignalingGroup-line#

Syntax **set signalingtype** or **set st {1 | 2 | 3}**

Arguments

- 1** Loop Start signaling only.
- 2** Loop Start Reverse Battery.
- 3** Loop Start with Fwd Disconnect

Default 1 (Loop Start)

Availability All Tenor Gen 2 Releases.

Example config CASSignalingGroup-line # **set st 3**

ToneBasedSupervision

Description Used to configure disconnect and answer supervision used for this trunk group.

Prompt Level config CASSignalingGroup-line#

Syntax: **set tonebasedsupervision** or **set tbs {0 | 1 | 2 | 3}**

Arguments

- 0** No Supervision set
- 1** Disconnect Supervision only
- 2** Answer Supervision only
- 3** Answer and Disconnect Supervision

Default 0 (None)

Availability All Tenor Gen 2 Releases.

Example config CASSignalingGroup-line # **set tbs 1**

AnswerDelay

Description When ToneBasedSupervision = 0, this setting determines the delay period (in seconds) before issuing a connect (not true answer supervision).
When ToneBasedSupervision = 2 or 3, this setting determines the period (in seconds) to detect voice for answer supervision. If the time expires, a connect is issued and billing begins.

Prompt Level config CASSignalingGroup-line#

Syntax **set answerdelay** or **set ad {ms}**

Arguments **sec** Number of milliseconds (0 – 60000 max)

Default tbs = 0, 1 – ad default = 0; tbs = 2, 3 – ad default = 45

Availability All Tenor Gen 2 Releases.

Example config CASSignalingGroup-line# **set ad 20**

AnswerSupervisionMoreSensitive

Description Used to adjust the sensitivity of the voice detection answer supervision. If enabled, the Tenor will be more sensitive to the detection of answer messages and might detect more quickly, but is also more likely to register false connects.

Prompt Level config CASSignalingGroup-line#

Syntax: **set answersupervisionmoresensitive** or **set asms {0 | 1}**

Arguments **0** Disabled, normal sensitivity.
1 Enabled, more sensitive.

Default 0

Availability All Tenor Gen 2 Releases.

Example config CASSignalingGroup-line# **set asms 1**

AnswerSupervisionLessFilter

Description Used to adjust the sensitivity of the voice detection answer supervision. Enabling this option, especially on noisy lines, runs the risk of false answer supervision. We recommend you keep the setting at 0.

Prompt Level config CASSignalingGroup-line#

Syntax **set answersupervisionlessfilter** or **set aslf {0 | 1}**

Arguments **0** Disabled, normal filtering.
1 Enabled, less filtering.

Default 0

Availability All Tenor Gen 2 Releases.

Example config CASSignalingGroup-line# **set aslf 1**

AnswerSupervisionDelayAnswer

Description Used to adjust the sensitivity of the voice detection answer supervision. When enabled, the Tenor will make sure that no disconnect tone is heard after ring back to declare the line answered.

Prompt Level config CASSignalingGroup-line#

Syntax **set answersupervisiondelayanswer** or **set asda {0 | 1}**

Arguments **0** Disabled.
1 Enabled.

Default 0

Availability All Tenor Gen 2 Releases.

Example config CASSignalingGroup-line# **set asda 1**