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# CTNG™ v1.0 Programmer's Guide

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## **CTNG™ Version 1.0 Programmer's Guide**

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IPTC Technology Communication AB  
Ostmästargränd 12, 2TR  
120 89 Stockholm, Sweden  
Telephone +46 8 602 3191, Telefax +46 8 602 3199  
Email: <mailto:info@iptc.se>  
Web: <http://www.iptc.se>

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## Introduction

### Overview

#### ***What Is the CTNG?***

The CTNG is a software module that allows a computer to interact with a PABX using an interface based on CSTA. The software module is not a complete application that can be used directly, but is rather a means for writing customized applications. The CTNG consists of routines for managing CSTA objects, and performing services based on the CSTA Phase I standard.

#### ***What Is CSTA?***

CSTA stands for Computer-Supported Telecommunications Applications and is a standard for interconnecting general purpose computers with telephony exchanges. The purpose of CSTA is to enhance the functionality of both the computers and the telephony exchange. This is achieved by allowing them to use the services provided by the other part, without significantly changing or redesigning any of them.

CSTA defines the interact mechanisms between computers and telephony exchanges independently of their physical implementation. This makes it possible for any computer to connect and interact with any exchange, providing that both support CSTA.

#### ***About This Document***

This document is a guide for how to use the CTNG in order to write an application on a computer that uses the CSTA services provided by a switch. The first chapters deal with general information, while the last chapters are intended for programmers and deal with programming details.

#### ***What You Need To Know?***

In order to use the CTNG you need to have experience with Microsoft Component Object Model (COM), and a programming language that support COM.

#### ***Other Recommended Reading***

<b>AL40PG</b>	Ericsson MD110 Application Link Version 4.0 (AL40) Application Programmer's Guide, Doc-Id: EN/LZT 102 2273 R5A
<b>ECMA-179</b>	Services for Computer Supported Telecommunication Applications (CSTA) Phase I
<b>ECMA-180</b>	Protocol for Computer Supported Telecommunication Applications (CSTA) Phase I
<b>CTNG10RM</b>	IPTC AB, CTNG v1.0 Reference Manual

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## Programmer's Guide

Full sample sources could be found in CTNG library distribution directory.

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## Visual Basic Sample

Notes on the given sample:

- ?? CTNLib.Device should be declared *WithEvents* qualifier, and later on object allocated with New.
- ?? The full initialization sequence that should be performed only once is given in Initialize () subroutine.
- ?? Functions verbSysStat, verbConnInfo and verbCause are utility functions used to transform enumerated values CTNLib.SystemStatusType, CTNLib.LocalConnectionStateType and CTNLib.EventCauseType to their verbose String values.

Option Explicit

Public csta As New CTNLib.System

Public pabx As New CTNLib.pabx

Public WithEvents dev As CTNLib.device

Private Sub Initialize

    csta.AddPABX "md110", "csta.md110.com", 2555

    pabx.Open "md110"

    Set dev = New CTNLib.Device

    dev.Open pabx, "805"

End Sub

Private Function verbConnInfo(ByVal info As  
CTNLib.LocalConnectionStateType) \_ As String

    Select Case info

        Case lcs\_alerting  
            verbConnInfo = "Alerting"

        Case lcs\_connected  
            verbConnInfo = "Connected"

        Case lcs\_fail  
            verbConnInfo = "Fail"

        Case lcs\_hold  
            verbConnInfo = "Hold"

        Case lcs\_initiated  
            verbConnInfo = "Initiated"

        Case lcs\_null  
            verbConnInfo = "Null"

        Case lcs\_queued  
            verbConnInfo = "Queued"

        Case lcs\_unknown  
            verbConnInfo = "Unknown"

        Case Else  
            verbConnInfo = "???"

    End Select

End Function

Private Function verbCause(ByVal cause As CTNLib.EventCauseType) As  
String

    Select Case cause

        Case ec\_activeMonitor  
            verbCause = "Active Monitor"

        Case ec\_alternate  
            verbCause = "Alternate"

        Case ec\_busy  
            verbCause = "Busy"

        Case ec\_callBack  
            verbCause = "Call Back"

        Case ec\_callCancelled  
            verbCause = "Cancelled"

        Case ec\_callForward

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```

        verbCause = "Call Forward"
    Case ec_callForwardAlways
        verbCause = "Call Forward Always"
    Case ec_callForwardBusy
        verbCause = "Call Forward Busy"
    Case ec_callForwardNoAnswer
        verbCause = "Call Forward No Answer"
    Case ec_callNotAnswered
        verbCause = "Call Not Answered"
    Case ec_callPickup
        verbCause = "Call Pickup"
    Case ec_campOn
        verbCause = "Camp On"
    Case ec_destNotObtainable
        verbCause = "Destination Not Obtainable"
    Case ec_doNotDisturb
        verbCause = "Do Not Disturb"
    Case ec_incompatibleDestination
        verbCause = "Incompatible Destination"
    Case ec_invalidAccountCode
        verbCause = "Invalid Account Code"
    Case ec_keyConference
        verbCause = "Key Conference"
    Case ec_lockout
        verbCause = "Lockout"
    Case ec_maintenance
        verbCause = "Maintenance"
    Case ec_networkCongestion
        verbCause = "Network Congestion"
    Case ec_networkNotObtainable
        verbCause = "Network Not Obtainable"
    Case ec_newCall
        verbCause = "New Call"
    Case ec_noAvailableAgents
        verbCause = "No Available Agents"
    Case ec_overflow
        verbCause = "Overflow"
    Case ec_override
        verbCause = "Override"
    Case ec_park
        verbCause = "Park"
    Case ec_recall
        verbCause = "Recall"
    Case ec_redirected
        verbCause = "Redirected"
    Case ec_reorderTone
        verbCause = "Reorder Tone"
    Case ec_resourcesNotAvailable
        verbCause = "Resources Not Available"
    Case ec_silentParticipation
        verbCause = "Silent Participation"
    Case ec_transfer
        verbCause = "Transfer"
    Case ec_trunksBusy
        verbCause = "Trunks Busy"
    Case ec_unknown
        verbCause = "Unknown"
    Case ec_voiceUnitInitiator
        verbCause = "Voice Unit Initiator"
    Case Else
        verbCause = "???"
    End Select

```

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End Function

```

Private Sub dev_OnDelivered( _
    ByVal connection As String, _
    ByVal alertingDevice As String, _
    ByVal callingDevice As String, _
    ByVal calledDevice As String, _
    ByVal lastRedirectionDevice As String, _
    ByVal localConnectionInfo As CTNGLib.LocalConnectionStateType, _
    ByVal cause As CTNGLib.EventCauseType _
)
    Report = Time$ + " DELIVERED Event" + vbCrLf _
    + "    connection: " + connection + vbCrLf _
    + "    alerting device: " + alertingDevice + vbCrLf _
    + "    calling device: " + callingDevice + vbCrLf _
    + "    called device: " + calledDevice + vbCrLf _
    + "    last redirection device: " + lastRedirectionDevice + vbCrLf _
    + "    local connection info: " + verbConnInfo(localConnectionInfo) +
vbCrLf _
    + "    cause: " + verbCause(cause) + vbCrLf
End Sub

```



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## HTML Sample

Notes on the given sample:

- ?? CTNLib.Device should be defined with <OBJECT></OBJECT> HTML statement so HTML page could receive events.
- ?? The full initialization sequence that should be performed only once is given in Initialize() subroutine.
- ?? Functions verbSysStat, verbConnInfo and verbCause are utility functions used to transform enumerated values CTNGLib.SystemStatusType, CTNGLib.LocalConnectionStateType and CTNGLib.EventCauseType to their verbose String values.

```
<SCRIPT LANGUAGE=vbscript>
<!--
    Dim csta ' CTNG.System object
    Dim pabx ' CTNG.PABX object
    Dim cnid ' CTNG connection id

    pabxid = "mdl10" ' our name of the exchange
    ipaddr = "csta.server.com" ' address of AL40
    devid = "805" ' change this to actual DN
```

```
Private Sub Initialize ()

    Set csta = CreateObject( "CTNG.System" )
    ' csta.OpenConsole
    csta.AddPABX pabxid, ipaddr, 2555
    csta.Dump

    Set pabx = CreateObject( "CTNG.PABX" )
    pabx.Open pabxid

    devc.Open pabx, devid
End Sub
```

```
Private Function verbConnInfo( info )
    Select Case info
    Case -1
        verbConnInfo = "Unknown"
    Case 0
        verbConnInfo = "Null"
    Case 1
        verbConnInfo = "Initiated"
    Case 2
        verbConnInfo = "Alerting"
    Case 3
        verbConnInfo = "Connected"
    Case 4
        verbConnInfo = "Hold"
    Case 5
        verbConnInfo = "Queued"
    Case 6
        verbConnInfo = "Fail"
    Case Else
        verbConnInfo = "???"
    End Select
End Function
```

```
Private Function verbCause( cause )
    Select Case cause
    Case -1
```

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```

        verbCause = "Unknown"
Case 1
        verbCause = "Active Monitor"
Case 2
        verbCause = "Alternate"
Case 3
        verbCause = "Busy"
Case 4
        verbCause = "Call Back"
Case 5
        verbCause = "Cancelled"
Case 9
        verbCause = "Call Forward"
Case 6
        verbCause = "Call Forward Always"
Case 7
        verbCause = "Call Forward Busy"
Case 8
        verbCause = "Call Forward No Answer"
Case 10
        verbCause = "Call Not Answered"
Case 11
        verbCause = "Call Pickup"
Case 12
        verbCause = "Camp On"
Case 13
        verbCause = "Destination Not Obtainable"
Case 14
        verbCause = "Do Not Disturb"
Case 15
        verbCause = "Incompatible Destination"
Case 16
        verbCause = "Invalid Account Code"
Case 17
        verbCause = "Key Conference"
Case 18
        verbCause = "Lockout"
Case 19
        verbCause = "Maintenance"
Case 20
        verbCause = "Network Congestion"
Case 21
        verbCause = "Network Not Obtainable"
Case 22
        verbCause = "New Call"
Case 23
        verbCause = "No Available Agents"
Case 26
        verbCause = "Overflow"
Case 24
        verbCause = "Override"
Case 25
        verbCause = "Park"
Case 27
        verbCause = "Recall"
Case 28
        verbCause = "Redirected"
Case 29
        verbCause = "Reorder Tone"
Case 30
        verbCause = "Resources Not Available"
Case 31

```

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```
        verbCause = "Silent Participation"
    Case 32
        verbCause = "Transfer"
    Case 33
        verbCause = "Trunks Busy"
    Case 34
        verbCause = "Voice Unit Initiator"
    Case Else
        verbCause = "???"
    End Select
End Function

Private Sub devc_OnDelivered(connection, alertingDevice, callingDevice,
calledDevice, lastRedirectionDevice, localConnectionInfo, cause)
    Report.innerHTML = "DELIVERED Event.....: <b>" + connection +
"</b>, " _
        + alertingDevice + ", <b>" + callingDevice + "</b>, " _
        + calledDevice + ", " + lastRedirectionDevice _
        + ", " + verbConnInfo( localConnectionInfo ) _
        + ", " + verbCause( cause ) _
        + "<br>" + vbCrLf + Report.innerHTML
End Sub

//-->
</SCRIPT>

<!-- if we want that browser receives events, the object must be
embedded -->
<OBJECT id=devc classid="clsid:2BE420EA-C378-40F8-BF73-B19CFF854186" />
```