

It is assumed that the T1/E1 Analyzer Hardware, Software and License installations are already performed referring to the purchased Hardware Installation Guide.

Note:

After upgrading OS to Windows® 10, if the software shows error while invoking the T1 E1 application then, re-install the T1 E1 Analyzer.

Scenario #1: MAPS™ ISDN Application Normal Call Placing using ARINC Protocol Standard

For functional verification, 2 instances of MAPSTM ISDN application is configured on a single PC, as Subscriber (User) and Switch (Network) nodes. The following steps explain MAPS[™] ISDN configuration on the same PC in loopback mode to simulate ISDN call control scenario.

On the first instance, MAPS[™] is configured as Switch, and on the second instance, MAPS[™] is configured as Subscriber generating ISDN call control messages.

Cross-connect T1/E1 Port #1 and Port #2 of the Hardware unit back-to-back using RJ48c loopback cable.



🗊 Note:

In this example, we have used tProbe T1 E1 analyzer. User can apply these steps on any T1 E1 hardware platforms such as Portable USB T1 E1 Analyzer, Dual Express PCIe card, Octal/Quad T1 E1 Analyzer, and Universal PCI T1 E1 Analyzer.

- Click on the **T1/E1 Analyzer** ¹²² icon created on the desktop and launch T1/E1 Analyzer application.
- Verify the following Interface settings in the T1/E1 main GUI
- > For T1 Analyzer, configure Port #1 and Port #2 with the following
- Framing = ESF, Loopback = No Loopback, Termination = Terminate, Clock = Internal, Cross Port = Normal > For E1 Analyzer, configure Port #1 and Port #2 with the following

Framing = CCS, Loopback = No Loopback, Termination = Terminate, Clock = Internal, Cross Port = Normal

껲	T	1 tProbe	e Analyzer				- 🗆 🗙	
File Config View M	Aonitor In	trusiveTe	st Special A	pplications	Window	Help		
x Port Framing	Loopbac	ck	Termination	Clock	B8ZS	Cross-port	Set all cards as selected	
믜 1 ESF (193E)	No Loop	oback	Terminate	Internal	On	Normal		
2 ESF (193E)	No Loop	oback	Terminate	Internal	On	Normal	<- Double-click to change values	
- 40					_			
	T1/E1	Alarms			•			
Reset	All Ports	#1	#2					
Sync Loss		 Image: A start of the start of						
Bipolar Violation		 Image: A second s						
Carrier Loss		 			_			
Frame Error		_ <	× .		_			
Blue Alarm	_	_ <u>×</u> _	~		_			
Yellow Alarm	<u> </u>	- <u>×</u>	× .		- 100			
AIS	•	•	· ·		- 1			
	T1/E1 \$	Statistic	6		•			
Frequency (Hz)		1543999	1543999		-			
Level (dBdsx)		0.396	5 0.368					
BPV Errors			0 0					
CRC Errors) 0		_			
Frame Errors) 0		_			
Transmit Under Run		(0 0					
Receive Over Run			0 0					
==Bit/Frame Clock Slip==								

- Verify the Sync and Alarm Status between the ports are indicated in Green 💙 in T1/E1 Alarms pane. Click Reset button to reset the alarms.
- From T1/E1 Analyzer main window, invoke the WCS Server from Special Applications → Windows Client Server (WCS) → WCS Server.



- Configure WCS as follows -
 - Listen Port = 17080 (for T1 systems); 17090 (for E1 systems)
 - \blacktriangleright Messaging = Binary
 - \blacktriangleright Version = 4
 - > Click on **Start GL Server** button. Minimize the window.

Configuring MAPS™ ISDN as Switch

- From T1/E1 Analyzer main window, select Special Applications → Protocol Emulation → MAPSTM ISDN
 - Configure the following in the **Protocol Selection** window -
 - Protocol Standard = ISDN
 - Protocol Version = ARINC746
 - \blacktriangleright Node = Switch
 - Click Ok
- This instance of MAPS[™] is configured for **Call Reception**
- By default, <u>Testbed Setup</u> window is displayed. Click *m* and select '1 Switch_Card2', check for the following default parameter values:
 - Channel Mapping = Timeslot Based
 - > T1/E1 Port Number = 2
 - > Signaling Timeslot = 16
 - Signaling Subchannel = 1..8
 - End User Configuration = Switch_Profiles.xml
- On the MAPS[™] ISDN main window, select **Configuration** → **Incoming Call Handler Configuration**. Verify that the **Recvcall.gls** script is loaded against the **SETUP** message. Now, Close the window.

D Note:

If the script is not loaded properly, then, in the **Incoming Call Handler Configuration**, click on Load Configuration icon and load **Master Configuration**.

Configuring MAPS[™] ISDN as Subscriber

- From T1 E1 Analyzer main window, from Special Applications → Protocol Emulation → MAPSTM ISDN
- Configure the following in the Protocol Selection window -
 - Protocol Standard = ISDN
 - Protocol Version = ARINC746
 - ➢ Node = Subscriber.
 - Click Ok
- This instance of MAPSTM is configured for Call Generation
- By default, <u>Testbed Setup</u> window is displayed. Click *m* and select '**1 Subscriber_Card1**' and check for the configuration settings as below:
 - Channel Mapping = Timeslot Based
 - $\succ T1/E1 Port Number = 1$
 - Signaling Timeslot = 16
 - Signaling Subchannel = 1..8
 - End User Configuration = Subscriber_Profiles.xml

Protocol Selection	×
Protocol Standard ISDN	•
Protocol Version ARIN	C746 🗾
Node Switc	h 💌
Transport	v
	ОК

818 West Diamond Avenue - Third Floor Gaithersburg, MD 20878

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- Start the test bed setup on both the MAPS[™] instances
- Once the test bed setup is started on both the instances of MAPS[™] ISDN (Switch and Subscriber), select **Reports** → **Link Status** window. Ensure that the **Link Status** is **UP** (indicated in Green LED) before placing the call.

R.	Link Status	
Link Id	Link Status	
1	UP	

- In MAPS[™] ISDN (Subscriber) main window, click [™] Call Generation icon from the toolbar
 - > By default, multiple call profiles are loaded with **Placecall.gls** script and **Card1TS**** profiles.

Note:

If the script/profile is not loaded properly, then, in the **Call Generation** window, click on Load Configuration icon and load **Default** configuration.

- Now, select the pre-configured call instance and click on Start to start placing the ISDN calls.
- Now, go to MAPS[™] ISDN Switch, from the toolbar, click [≫] Call Reception icon. Observe that the calls are automatically received in the Call Reception window with Recvcall.gls script.

• Wait for the calls to terminate and verify the Message Decode and Message Sequence at both Generation and Reception end.

• Select any message in the ladder diagram and observe the decode message on the right pane.

🔐 MAPS (N	lessage Automatic	on Protocol Sim	ulation) Subscr	iber (ISDN ARINC746) - [Call	Generatio	n - CallGenDefault]						– 🗆 X
🍝 Configu	rations E <u>m</u> ulator	Reports Ed	litor <u>D</u> ebug To	ools <u>W</u> indows <u>H</u> elp								_ <i>8</i> ×
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- 🐭 💷		🕐 📂 🤉	🛯 🔍 🔏	0 0 2 7	k 🕑							
🗅 📂	8		8 6	6								
Sr No	Script Name	Profile	Call Info	Script Execution	Status		Events	Events Profile	9	Result	Total Iterations	Completed Iterations 🔺
1	Placecall.gls	Card1TS01	1,1	Start		Call Released	None			Pass	1	1
2	Placecall.gls	Card1TS02		Start			None			Unknown	1	1
3	Placecall.gls	Card1TS03	1,3	Start		Call Released	None			Pass	1	1 🗸
<												>
Add	Delete Insert	Refresh S	Start Start All	Stop 🔻 Stop All 🔻	Abort	Abort All						
<u>S</u> ave	Column Width		— 🔽 Show L	atest								
	Subscriber			Switch		Fi	nd					
		SE.	THP			ARINO	746 Layer ====		=			^
			101	14:30:39.985000	0000	Protocol Discrimi	nator		= 00001000	Q.931 User-N	letwork Call Contr	rol Messages
	4	CALL PRO	DCEEDING		0002	Call Reference E	agen		= 0	(1) Origination	Side	
	•			14:30:40.291000	0002	Call Reference Va	lue		= .0000101	(5)		
		ALEF	RTING	14-20-40-291000	0003	Message Type			= 00000101	SETUP		
				14.30.40.231000		Bearer Capability			=			
	4	CON	NECT	14:30:40.291000	00004	Length	ient		= 1 (x01)	Bearer Capar	SILLEY	
	1	CONNECT AC			0006	Information Tran	sfer Capabilit;	Y	=00001	Telephone/sp	eech (64 kbps PCM	1 Alaw voice on
		CONNECT AC	INNUWLEDGE	14:30:40.291000	0006	Coding Standard			= .11	Standard def	fined for the netw	work present on
	File T	ransmitted :: a-lav	w samples\count	10.pcm	0006	Spare			= 1	(1)		
				14:31:00.346000	0007	Information Eler	ation		= 00011000	Channel Ider	tification	
		DISCO	INNECT	14 01 40 000000	0008	Length			= 3 (x03)			
				14:31:40.282000	0009	Interface ID pre	sent		= .0	Interface in	mplicitly identifi	ied
		REL	EASE	14:31:40 282000	0009	Interface type			=1	Primary rate	interface	
				14.51.40.202000	0009	Preferred/Exclus	ive		=0	Indicated ch	annel is preferre	ed
	4	RELEASE	COMPLETE	14:31:40.591000	00009	Information char	nel selection		=01	As indicated	i in following oct	tets
					000A	Coding Standard			= .00	CCITT standa	ardized coding	
			_		6000A	Number/Man			= 0	Channel is i	indicated by numbe	er in following
					<u> </u>							>
Scripts	λ Message Sequ	ence / Event	Config Scrip	ot Flow								
						Initialisation Error	ors 🛛 🕲 Err	or Events		Captured Errors	😑 Link Sta	atus Up=1 Down=0



Scenario #2: MAPS™ ISDN Get and Set Request Calls using ARINC Protocol Standard

Configuring MAPS™ ISDN as Switch

- From T1/E1 Analyzer main window, select Special Applications → Protocol Emulation → MAPSTM ISDN
- Configure the following in the **Protocol Selection** window -
 - Protocol Standard = ISDN
 - Protocol Version = ARINC746
 - \blacktriangleright Node = Switch
 - Click Ok
- This instance of MAPS[™] is configured for **Call Reception**
- By default, <u>Testbed Setup</u> window is displayed. Click and select '1 Switch_Card2', check for the following default parameter values:
 - Channel Mapping = Timeslot Based
 - \succ T1/E1 Port Number = 2
 - \blacktriangleright Signaling Timeslot = 16
 - ▶ Signaling Subchannel = 1..8
 - End User Configuration = Switch_Profiles.xml
 - On the MAPSTM ISDN main window, select Configuration \rightarrow Incoming Call Handler Configuration.
 - > Verify that the **Recvcall.gls** script is loaded against the **SETUP** message.
 - > Verify that the **EquipmentControlLinkEvents.gls** script is loaded against the **Get and Set Request** message.
 - ➢ Now, Close the window

D Note:

If the script is not loaded properly, then, in the **Incoming Call Handler Configuration**, click on Load Configuration icon and load **Master Configuration**.

• On the MAPS[™] ISDN main window, select Editor → Profile Editor. This will open Profile Editor window. Click on *m*, select ControlLinkProfile, and click OK. Select the configurations as shown in the below figure. Click on Save to save the configuration.

Profile Editor - ControlLinkProfile			
🗀 🔜 🔣 💡			0
# Profiles (Edit-F2) 1 ControlLinkProfile	Config ControlLinkProfile	Value	AirGroundLinkStatus
	Event Report Request Params Event Report Request Managed Object Class	Report Altitude CTU	Select Option
	- Event Report Response Params L Event Reply - Get and Set Request Params	Accepted	
	Managed Object Class Get or Set Attribute IDs Get and Set Response Params	CTU Air-to-Ground Link Status	
	 Air to Ground Link Status Aircraft ID Aircraft ID Number Availability Status 	Non-Operational ICAO Aircraft Number 111 Normal Operation	
	- CTU Capabilities - Aircraft Altitude	Capability is present 35000	Add Insert Delet
Insert Delete Clear			

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Pı	rotocol Selection		\times
	Protocol Standard	ISDN	•
	Protocol Version	ARINC746	•
	Node	Switch	•
	Transport		Ŧ
		OK	



Configuring MAPS[™] ISDN as Subscriber

- From T1 E1 Analyzer main window, from Special Applications → Protocol Emulation → MAPSTM ISDN
- Configure the following in the Protocol Selection window -
 - Protocol Standard = ISDN
 - Protocol Version = ARINC746
 - ➢ Node = Subscriber.
 - > Click Ok
- This instance of MAPSTM is configured for Call Generation
- By default, <u>Testbed Setup</u> window is displayed. Click *m* and select '**1** Subscriber_Card1' and check for the configuration settings as below:
 - Channel Mapping = Timeslot Based
 - \succ T1/E1 Port Number = 1
 - Signaling Timeslot = 16
 - Signaling Subchannel = 1..8
 - End User Configuration = Subscriber_Profiles.xml
- On the MAPS[™] ISDN main window, select **Editor** → **Profile Editor**. This will open Profile Editor window. Click on *m*, select ControlLinkProfile, and click OK. Select the configurations as shown in the below figure. Click on Save to save the configuration.

Profile Editor - ControlLinkProfile			
冲 🗔 🔣 📍			0
Profiles (Edit F2) ControlLinkProfile	Config Config ControlLinkProfile Event Report Request Params Event Report Request Managed Object Class Event Report Response Params Event Reply Get and Set Request Params Air to Ground Link Status Aircraft ID Aircraft ID Number Availability Status CTU Capabilities Aircraft Altitude	Value Report Altitude CTU Accepted CTU Air-to-Ground Link Status Operational ICAO Aircraft Number 111 Normal Operation Capability is present 35000	ObjectClass Select Option CTU Add Insert Properties
Insert Delete Clear			

- Start the test bed setup on both the MAPS[™] instances
- Once the test bed setup is started on both the instances of MAPS[™] ISDN (Switch and Subscriber), select **Reports** → **Link** Status window. Ensure that the Link Status is UP (indicated in Green LED) before placing the call.

•	Link status	
Link Id	Link Status	
1	UP	



- In MAPS[™] ISDN (Subscriber) main window, click Scall Generation icon from the toolbar
 - By default, multiple call profiles are loaded with Placecall.gls script and Card1TS** profiles. Double-click under the Script Name column on the required call and select GetRequest.gls or SetRequest.gls as required from the drop-down list.

🌜 Call Generation - CallGenDefault							
			8				
Sr No	Script Name	Profile	Call Info				
1	SetRequest.gls	 Card1TS01 					
2	EquipmentControl	Card1TS02					
3	EventReportRequ	Card1TS03					
4	GetRequest.gls	Card1TS04					
5	LAPDStatus dis	Card1TS05					
6	MapsInit.gls	Card1TS06					
7	MAPSShutdown.	Card1TS07					
8	Placecall.gis Becycall.gis	Card1TS08					
9	SetRequest.gls	Card1TS09					
10	TDMFileNameCre	Card1TS10					
11	LIDM TrafficHandl	Card1TS11					

If the load	re: The script/profile is not loaded properly, then, in the Call Generation window, click on Load Configuration icon and Id Default configuration.
	Now, select the pre-configured call instance and click on <u>Start</u> to start placing the ISDN calls.

- Now, go to MAPSTM ISDN Switch, from the toolbar, click ^{SP} Call Reception icon. Observe that the calls are automatically received in the Call Reception window with GetRequest.gls or SetRequest.gls script.
- Wait for the calls to terminate and verify the **Message Decode** and **Message Sequence** at both **Generation** and **Reception** end.
- Select any message in the ladder diagram and observe the decode message on the right pane.

MAPS (Message Automation Protocol Simulation) Su	oscriber (ISDN ARINC746) - [Call	Generation - CallGenDefault]				_	
<u>Configurations</u> Emulator <u>Reports</u> Editor <u>Debu</u>	g Tools <u>W</u> indows <u>H</u> elp						_ 8 ×
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🕒 🗀 🔜 🕄 💡 💦 📳	<u>68</u>						
Sr No Script Name Profile Call Info	Script Execution	Status	Events	Events Profile	Result	Total Iterations	Comj 🔨
1 GetRequest.gls Card1TS01	Start	Get Response Received	None		Pass	1	
2 Placecall.gls Card1TS02	Start		None		Unknown	1	, ×
Add Delete Insert Refresh Start Start	t All Stop 🔻 Stop All 🔻	Abort Abort All					
Save Column Width - Sh	ow Latest	0					
Subscriber	Switch		Fir	id	_		
GET REQUEST	N 15 00 10 15 1000	0007	Length		= 1 (x01)	io nanagea objeco	~ ^
	15:06:43.154000	0008	Managed Object C	lass	= 0000010	01 CTU	
GET RESPONSE	15:06:43.469000	0009	Information Elem	ent	= 0000003	ll Managed object	ins
		A000	Length		= 1 (x01)		
		U000B	Managed object 1 Surrent Time	nstance	= 1 (x01)		
		0000	Information Elem	ent	= 000001)1 Cuurent Time	
		000D	Length		= 7 (x07)		
		000E	Century AD (Anno Voor within Cont	Domini)	= 1111111	ll Null	
		0010	Month within Yea	r	= 111111	ll Null	
		0011	Day within Month		= 111111	ll Null	
		0012	Hour within Day		= 1111111	ll Null	
		0013	Minute within Ho	ur	= 111111	ll Null	
		0014	Second Within Mi	nute	= 111111.	LI NULL	
		0015	Information Elem	ent Identifier	= 0001010	01 Attribute List	- 0
		0016	Length		= 2 (x02)		
		0017	Attribute Identi	fier List	= 0101010	01 Air-to-Ground 1	Link
		0018	Air-Ground Link	Status	= 0000000	Non-operational	~
<		> <					>
Scripts Message Sequence Event Config	Script Flow	- []					
· · · · · · · · · · · · · · · · · · ·		Initialisation Errors	Error Events	Captured I	Errors	Link Status Up=1 Dow	m=0

