

*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 MAPS™ 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.**




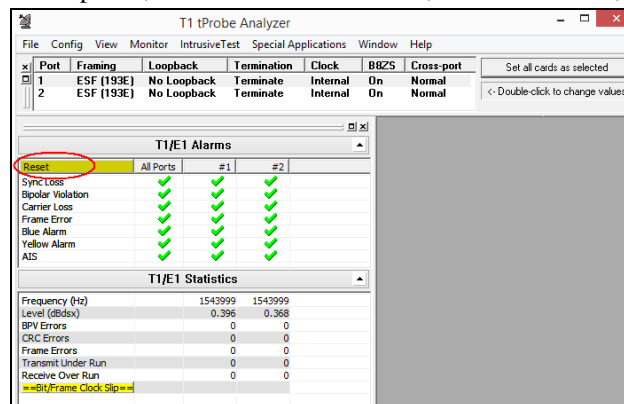
RJ48c Loopback Cable



**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**  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

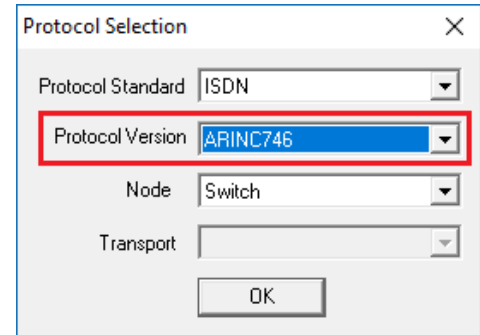



- Verify the **Sync and Alarm Status** between the ports are indicated in **Green** ✓ in **T1/E1 Alarms** pane. Click **Reset** button to reset the alarms.
- From T1/E1 Analyzer main window, invoke the **WCS Server** from **Special Applications** → **Windows Client Server (WCS)** → **WCS Server**.

- Configure WCS as follows -
  - Listen Port = 17080 (for T1 systems); 17090 (for E1 systems)
  - Messaging = Binary
  - 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 → MAPS™ ISDN**
- Configure the following in the **Protocol Selection** window -
  - Protocol Standard = **ISDN**
  - Protocol Version = **ARINC746**
  - Node = **Switch**
  - Click **Ok**




- This instance of MAPS™ is configured for **Call Reception**
- By default, **Testbed Setup** window is displayed. Click  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.

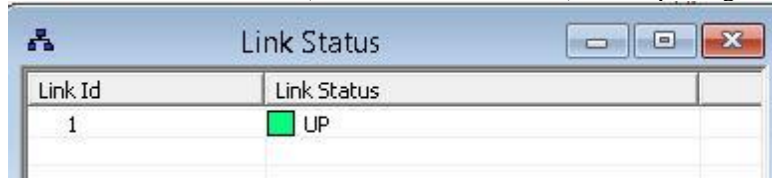
### **Note:**


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 → MAPS™ ISDN**
- Configure the following in the **Protocol Selection** window -
  - Protocol Standard = **ISDN**
  - Protocol Version = **ARINC746**
  - Node = **Subscriber**.
  - Click **Ok**
- This instance of MAPS™ is configured for **Call Generation**
- By default, **Testbed Setup** window is displayed. Click  and select '1 **Subscriber\_Card1**' and check for the configuration settings as below:
  - Channel Mapping = **Timeslot Based**
  - T1/E1 Port Number = **1**
  - Signaling Timeslot = **16**
  - Signaling Subchannel = **1..8**
  - End User Configuration = **Subscriber\_Profiles.xml**


- 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.




- 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.

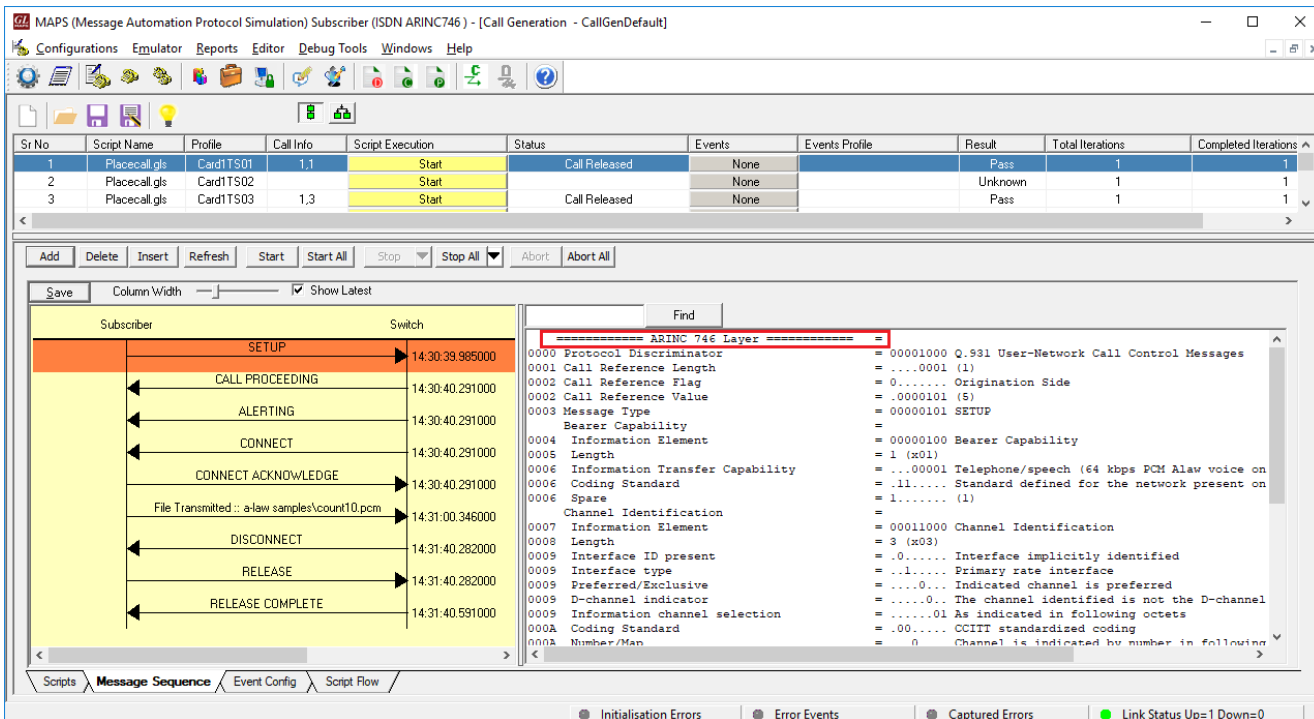


### Note:

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.



Sr No	Script Name	Profile	Call Info	Script Execution	Status	Events	Events Profile	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

Subscriber	Switch	Time
→	→	14:30:39.985000
←	←	14:30:40.291000
←	←	14:30:40.291000
←	←	14:30:40.291000
→	→	14:30:40.291000
→	→	14:31:00.346000
←	←	14:31:40.282000
←	←	14:31:40.282000
←	←	14:31:40.591000

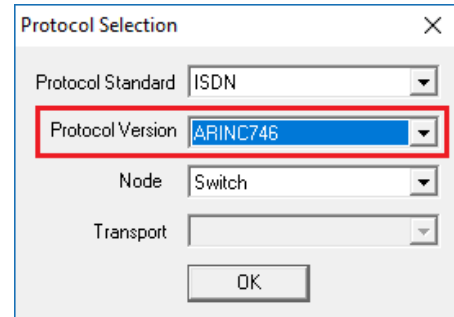
```


===== ARINC 746 Layer =====
0000 Protocol Discriminator = 00001000 Q.931 User-Network Call Control Messages
0001 Call Reference Length = ...0001 (1)
0002 Call Reference Flag = 0..... Origination Side
0002 Call Reference Value = .0000101 (5)
0003 Message Type = 00000101 SETUP
      Bearer Capability = 00000100 Bearer Capability
0004 Information Element = 1 (x01)
0005 Length = ...00001 Telephone/speech (64 kbps PCM Alaw voice on
0006 Information Transfer Capability = .11..... Standard defined for the network present on
0006 Coding Standard = 1..... (1)
      Spare =
      Channel Identification = 00011000 Channel Identification
0007 Information Element = 3 (x03)
0008 Length = .0..... Interface implicitly identified
0009 Interface ID present = .1..... Primary rate interface
0009 Interface type = ...0... Indicated channel is preferred
0009 Preferred/Exclusive = ....0... The channel identified is not the D-channel
0009 D-channel indicator = .....01 As indicated in following octets
0009 Information channel selection = .00..... CCITT standardized coding
000A Coding Standard = 0
000A Number/Man = 0 Channel is indicated by number in following
  
```

## 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 → MAPS™ ISDN**
- Configure the following in the **Protocol Selection** window -
  - Protocol Standard = **ISDN**
  - Protocol Version = **ARINC746**
  - Node = **Switch**
  - Click **Ok**

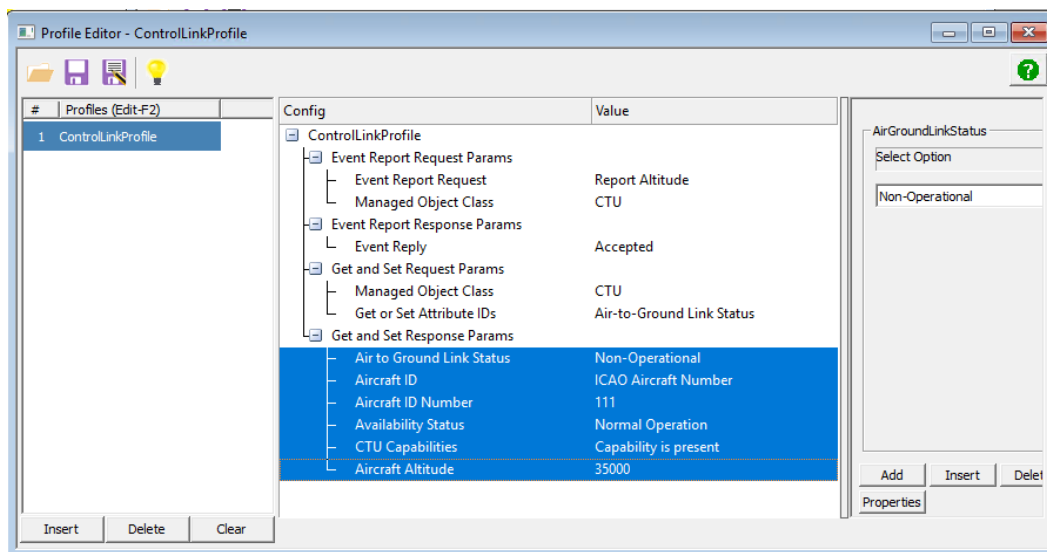


- This instance of MAPS™ is configured for **Call Reception**
- By default, **Testbed Setup** window is displayed. Click  and select '**1 Switch\_Card2**', check for the following default parameter values:
  - Channel Mapping = **Timeslot Based**
  - T1/E1 Port Number = **2**
  - Signaling Timeslot = **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.
  - Verify that the **EquipmentControlLinkEvents.gls** script is loaded against the **Get and Set Request** message.
  - Now, Close the window




### Note:

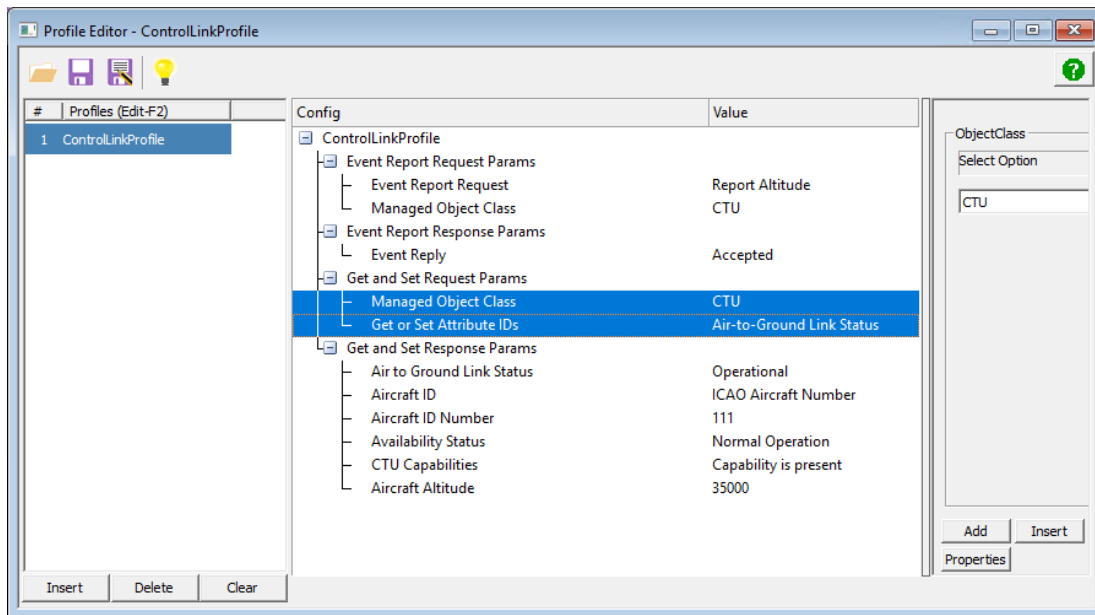
If the script is not loaded properly, then, in the **Incoming Call Handler Configuration**, click on Load Configuration icon and load **Master Configuration**.

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

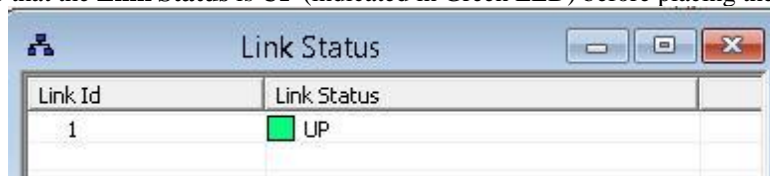



## Configuring MAPS™ ISDN as Subscriber

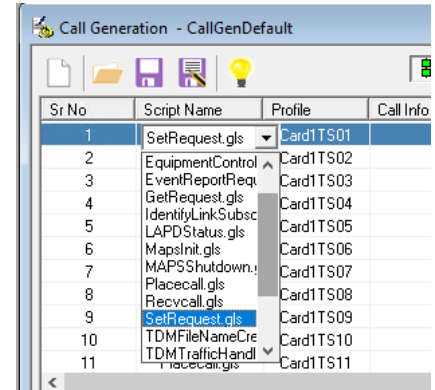
- From T1 E1 Analyzer main window, from **Special Applications** → **Protocol Emulation** → **MAPS™ ISDN**
- Configure the following in the **Protocol Selection** window -
  - Protocol Standard = **ISDN**
  - Protocol Version = **ARINC746**
  - Node = **Subscriber**.
  - Click **Ok**
- This instance of MAPS™ is configured for **Call Generation**
- By default, **Testbed Setup** window is displayed. Click  and select '**1 Subscriber\_Card1**' and check for the configuration settings as below:
  - Channel Mapping = **Timeslot Based**
  - 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 , select **ControlLinkProfile**, and click **OK**. Select the configurations as shown in the below figure. Click on  **Save** to save the configuration.




- 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.




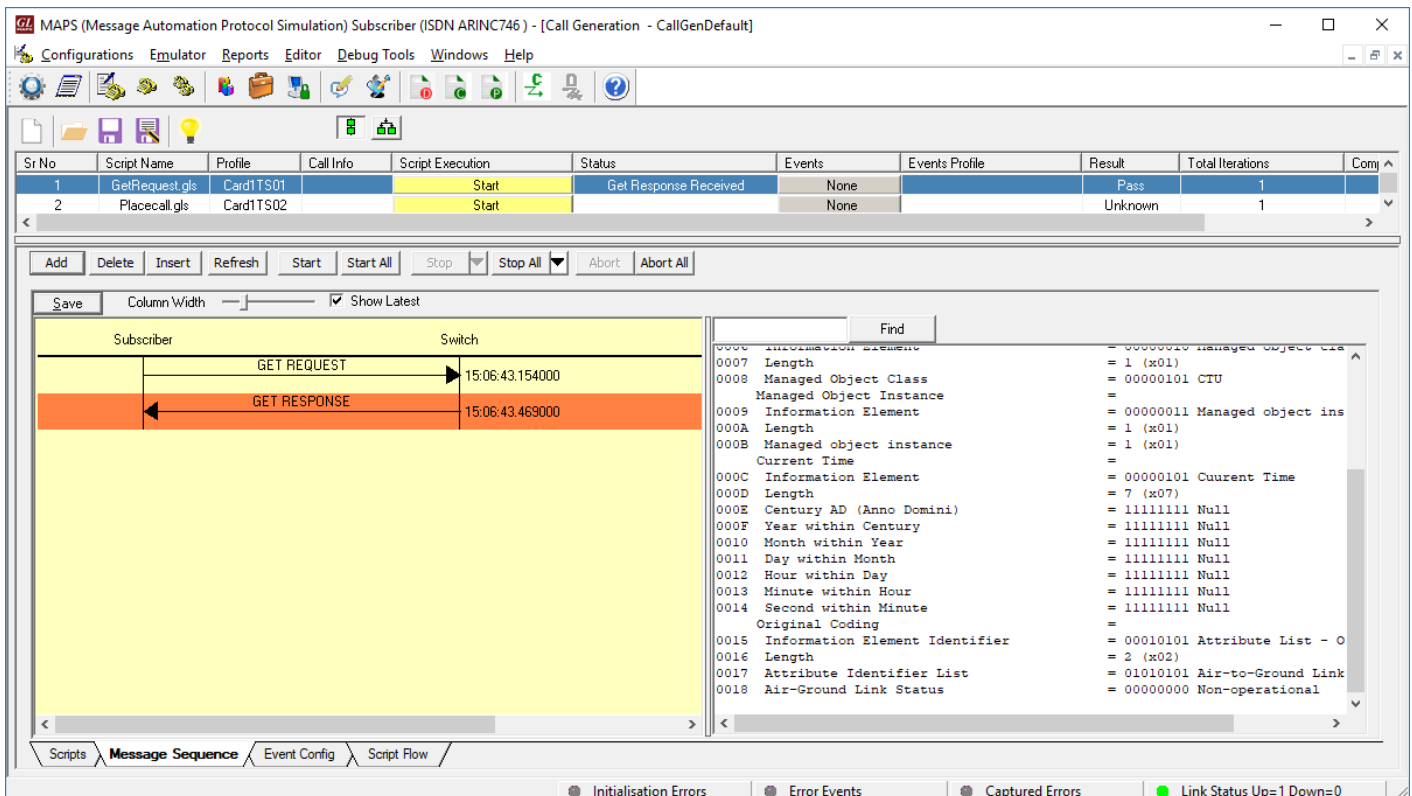
- In MAPS™ ISDN (Subscriber) main window, click  **Call Generation** icon from the toolbar
  - By default, multiple call profiles are loaded with **Placecall.gls** script and **Card1TS\*\*** profiles. Double-click under the Script Name column on the required call and select **GetRequest.gls** or **SetRequest.gls**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



## 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 **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.



Sr No	Script Name	Profile	Call Info	Script Execution	Status	Events	Events Profile	Result	Total Iterations	Com
1	GetRequest.gls	Card1TS01		Start	Get Response Received	None		Pass	1	
2	Placecall.gls	Card1TS02		Start		None		Unknown	1	

Subscriber      Switch

```

    GET REQUEST → 15:06:43.154000
    GET RESPONSE ← 15:06:43.469000
  
```

0000 Information Element = 00000010 Managed Object Class  
 0007 Length = 1 (x01)  
 0008 Managed Object Class = 00000101 CTU  
 0009 Information Element = 00000011 Managed object ins  
 000A Length = 1 (x01)  
 000B Managed object instance = 1 (x01)  
 000C Information Element = 00000101 Current Time  
 000D Length = 7 (x07)  
 000E Century AD (Anno Domini) = 11111111 Null  
 000F Year within Century = 11111111 Null  
 0010 Month within Year = 11111111 Null  
 0011 Day within Month = 11111111 Null  
 0012 Hour within Day = 11111111 Null  
 0013 Minute within Hour = 11111111 Null  
 0014 Second within Minute = 11111111 Null  
 0015 Information Element Identifier = 00010101 Attribute List - 0  
 0016 Length = 2 (x02)  
 0017 Attribute Identifier List = 01010101 Air-to-Ground Link  
 0018 Air-Ground Link Status = 00000000 Non-operational