

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

MAPS™ GSM Abis Application Verification

For functional verification, 2 instances of MAPS™ GSMAbis application can be invoked on a single PC configured as source and destination nodes. The following steps explain MAPS™ GSMABIS configuration on the same PC in loopback mode to simulate GSM protocol supporting procedures over Abis interface.

On first instance, MAPS™ is configured as **BSC** (Base Station Controller), and on the second instance, MAPS™ is configured as **BTS** (Base Transceiver Station) nodes generating supported procedure messages.

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

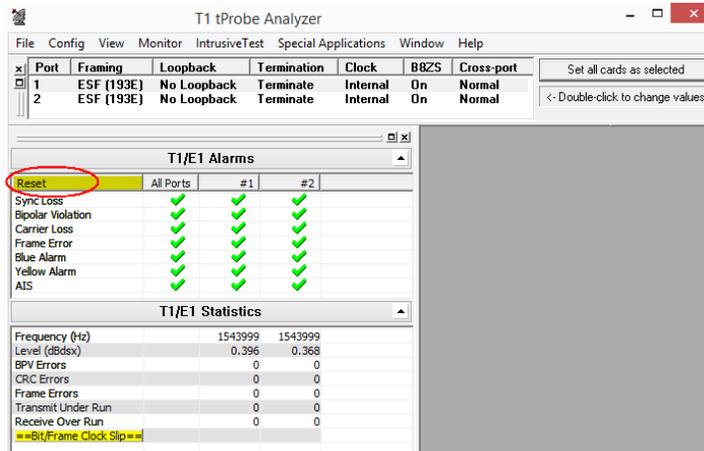


RJ48c Loopback Cable

- Click on the **T1/E1 Analyzer** icon created on the desktop (or) from the installation directory, click on **UsbNGT1.exe** and launch T1/E1 Analyzer application.

Note: The application may take some time to get started due to hardware and software initializations.

- 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 **Yellow Reset** button to reset the alarms.



- From T1/E1 Analyzer main window, invoke the **WCS Server: Special Applications > Windows Client Server (WCS) > WCS Server**.
- Configure WCS as follows -
 - Listen Port = 17090 (for E1 systems); 17080 (for T1 systems)
 - Messaging = Binary

- Version = 4
- Click on **Start GL Server** button.

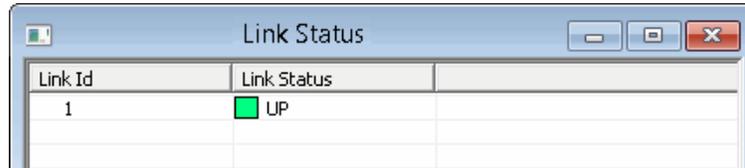
First MAPS™ GSMAbis (GUI) – (BSC)

- From T1/E1 Analyzer main window, from **Special Applications** menu > select **Protocol Emulation > MAPS™ GSM Abis Interface Emulator**
- While invoking the MAPS™ GSMAbis instance, verify the following in the **Protocol Selection** window -
 - **Protocol Standard = GsmAbis**
 - **Protocol Version = GSM900**
 - **Node = BSC**
 - Click **Ok**
- This instance of MAPS™ is configured for **Call Reception**
- By default, Testbed Setup window is displayed. Click  and select **TestBedDefault** and check for the following parameter default values:
 - **Physical T1 (or E1) Signaling Port Number = 1**
 - **Physical Signaling Timeslot = 1**
 - **Physical Trau Timeslot = 2**
- From MAPS GsmAbis main window, select **Configuration > Incoming Call Handler Configuration**. Verify that the **BSC_MOC.gls** script is loaded against the **CHANnelReQuireD** message. Close the window.
- In the same MAPS GsmAbis main window, select “**Editor**” menu -> invoke **Profile Editor** window.
 - Click  and select “**BSC_Profiles**” file. From the left pane, select **BSCProfile001** profile. Set **Call Type = Mobile Terminated Speech Call**, and **Enable Traffic = Auto Traffic** parameter values. Click  **Save** button. Exit from the window.

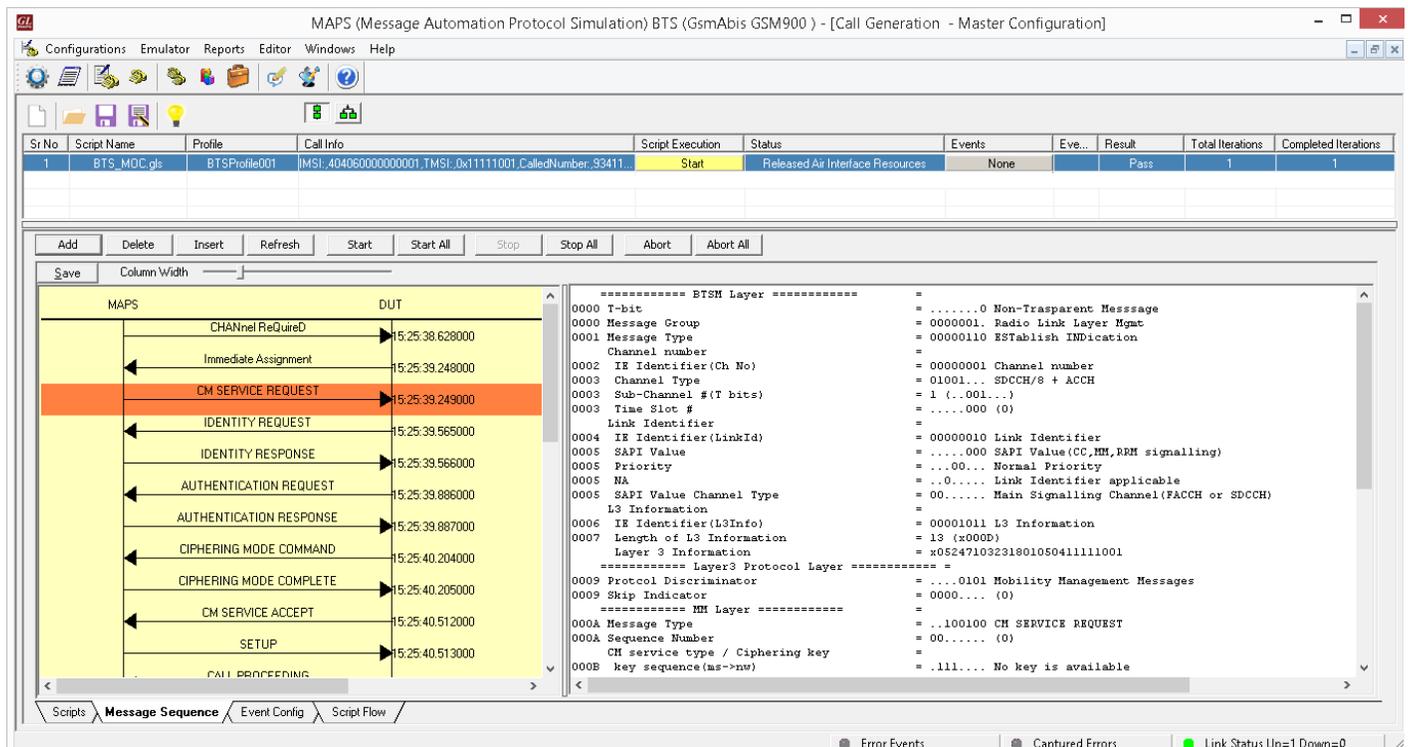
Second MAPS™ GSMAbis (GUI) – (BTS)

- From T1/E1 Analyzer main window, from **Special Applications** menu > select **Protocol Emulation > MAPS™ GSM Abis Interface Emulator**.
- While invoking the second MAPS™ GSMAbis instance, verify the following in the **Protocol Selection** window -
 - Protocol Standard = **GsmAbis**
 - Protocol Version = **GSM900**
 - Node = **BTS**
 - Click **Ok**
- This instance of MAPS™ is configured for **Call Generation**
- By default, Testbed Setup window is displayed. Click  and select **TestBedDefault** and check for the following parameter default values:
 - Physical T1 (or E1) Signaling Port Number = 2
 - Physical Signaling Timeslot = 1
 - Physical Trau Timeslot = 2
- From MAPS GsmAbis main window, select “**Editor**” menu -> invoke **Profile Editor** window:
 - Click  and select “**BTS_Profiles**” file. From the left pane, select **BTSPProfile001** profile. Set **Call Type = Mobile Originated Speech Call**, and **Enable Traffic = Auto Traffic** parameter values. Click  **Save** button. Exit from the window.

- **Start** the testbed on both the MAPS™ instances.
- **Note:** Once the test bed setup is started on both the instances of MAPS™ GSMAbis (BTS and BSC), from the main window, select **Reports** menu > invoke **Link Status** window. Verify that the **Link Status** is **UP** (indicated in Green color) before placing the call.



- In MAPS™ GSMAbis (BTS) main window, select **Emulator > Call Generation** option.
- By default, you will observe a call instance loaded with **BTS_MOC.gls** script and **BTSPProfile001** profile in the window.
- Click on the yellow **Start** button and initiate the MOC procedure.
- In the MAPS™ GSMAbis (BSC) main window, select **Emulator > Call Reception** option. Observe that the call is automatically received in the **Call Reception** window running the Rx script.
- Wait for the call to terminate, and verify the **Message Sequence** flow at both generation and reception end.
- Select any message in the ladder diagram and observe the respective decode message on the right pane for the respective message.



The screenshot displays the MAPS (Message Automation Protocol Simulation) interface. The top window shows the configuration for a call generation testbed. Below it, the Message Sequence window is active, showing a ladder diagram of the communication between the MAPS (Master) and the DUT (Device Under Test). The sequence of messages is as follows:

Message	Direction	Timestamp
CHANnel ReQuireD	MAPS to DUT	15:25:38.628000
Immediate Assignment	DUT to MAPS	15:25:39.248000
CM SERVICE REQUEST	MAPS to DUT	15:25:39.249000
IDENTITY REQUEST	DUT to MAPS	15:25:39.565000
IDENTITY RESPONSE	MAPS to DUT	15:25:39.566000
AUTHENTICATION REQUEST	DUT to MAPS	15:25:39.886000
AUTHENTICATION RESPONSE	MAPS to DUT	15:25:39.887000
CIPHERING MODE COMMAND	DUT to MAPS	15:25:40.204000
CIPHERING MODE COMPLETE	MAPS to DUT	15:25:40.205000
CM SERVICE ACCEPT	DUT to MAPS	15:25:40.512000
SETUP	MAPS to DUT	15:25:40.513000
CALL PROCEEDING	DUT to MAPS	

The right pane shows the decoded message details for the selected 'CM SERVICE REQUEST' message:

```

===== BTSM Layer =====
0000 T-bit = .....0 Non-Transparent Message
0000 Message Group = 0000001. Radio Link Layer Mgmt
0001 Message Type = 00000110 ESTABLISH INDICATION
      Channel number =
0002 IE Identifier (Ch No) = 00000001 Channel number
0003 Channel Type = 01001... SDCCH/8 + ACCH
0003 Sub-Channel # (T bits) = 1 (.001...)
0003 Time Slot # = .....000 (0)
      Link Identifier =
0004 IE Identifier (LinkId) = 00000010 Link Identifier
0005 SAPI Value = .....000 SAPI Value (CC, MM, RRM signalling)
0005 Priority = ..00... Normal Priority
0005 NA = ..0.... Link Identifier applicable
0005 SAPI Value Channel Type = 00..... Main Signalling Channel (FACCH or SDCCH)
      L3 Information =
0006 IE Identifier (L3Info) = 00001011 L3 Information
0007 Length of L3 Information = 13 (x000B)
      Layer 3 Information = x052471032318010504111111001
===== Layer3 Protocol Layer =====
0009 Protocol Discriminator = .....0101 Mobility Management Messages
0009 Skip Indicator = 0000.... (0)
===== MM Layer =====
000A Message Type = ..100100 CM SERVICE REQUEST
000A Sequence Number = 00..... (0)
      CH service type / Ciphering key =
000B key sequence (ms->mw) = .111.... No key is available
  
```