

W-CDMA HSPA Evolution IP Data Transfer

Radio Communication Analyzer MT8821C

Revision History

Ver. No	Date	Contents	Related product software version
1.00	2015/09	First edition	MX882115C MX882115C-001 v.30.10

Contents

1. W-CDMA HSPA Evolution IP Data Transfer Measurement Software	3
1.1. Specifications.....	3
1.1.1. MX882115C.....	3
1.1.2. MX882115C-001	4
1.2. HSPA Evolution IP Data Transfer Test	5
1.2.1. Setting MT8821C and Application Server	6
1.2.2. Setting Client PC.....	8
1.2.3. Initial Condition Setting.....	8
1.2.4. Position Registration and Packet Connection	10
1.2.5. UDP Throughput Test for IP Data Transfer	16
1.2.6. TCP Throughput Test for IP Data Transfer	17
1.2.7. Disconnection.....	17
1.3. IP Data Transfer Test using IPv6.....	18
1.3.1. TCP/IP Version 6 Installation (Windows XP server/client PC only).....	19
1.3.2. Server PC Connection and Setting (Windows XP)	20
1.3.3. Server PC Connection and Setting (Windows 7/Vista)	23
1.3.4. Initial Condition Setting when Using IPv6	26
1.3.5. Position Registration and Packet Connection Establishment when Using IPv6	28
1.3.6. IP Data Transfer TCP Throughput Verification when Using IPv6	34

1. W-CDMA HSPA Evolution IP Data Transfer Measurement Software

1.1. Specifications

1.1.1. MX882115C

Chart1.1-1: W-CDMA HSPA Evolution IP Data Transfer Measurement Software Specifications (MX882115C)

Item	Specifications	
Electrical characteristics	Typical values (typ.) are only for reference and are not guaranteed.	
Amplitude measurement	Frequency	350 to 2700 MHz
	Input level	-65 to +35 dBm (Main1/2)
	Measurement accuracy	±0.5 dB (-30 to +35 dBm), typ. ±0.3 dB (-30 to +35 dBm), ±0.7 dB (-55 to -30 dBm), ±0.9 dB (-65 to -55 dBm), After calibration, 10 to 40 °C
	Linearity	±0.2 dB (-40 to 0 dB, ≥-55 dBm), ±0.4 dB (-40 to 0 dB, ≥-65 dBm)
	Measurement target	DPCH, HS-DPCCH, E-DPCCH, E-DPDCH
RF signal generator	Output frequency	300 to 2700 MHz (1 Hz step)
	EVM	≤ 4% rms
	Channel	CPICH, P-CCPCH, SCH, PICH, DPCH, S-CCPCH, AICH, HS-SCCH, HS-PDSCH, E-AGCH, E-RGCH, E-HICH, OCNS
Throughput measurement	Function	Measures throughput using IP data transfer
	Measurement target	ACK and NACK on HS-DPCCH
Call processing	Call control	Position registration, Call processing using Packet, Network-side disconnection, Terminal-side disconnection (Executes each processing in 3GPP standards)
	UE control	Output level (Executes each UE control in 3GPP standards)

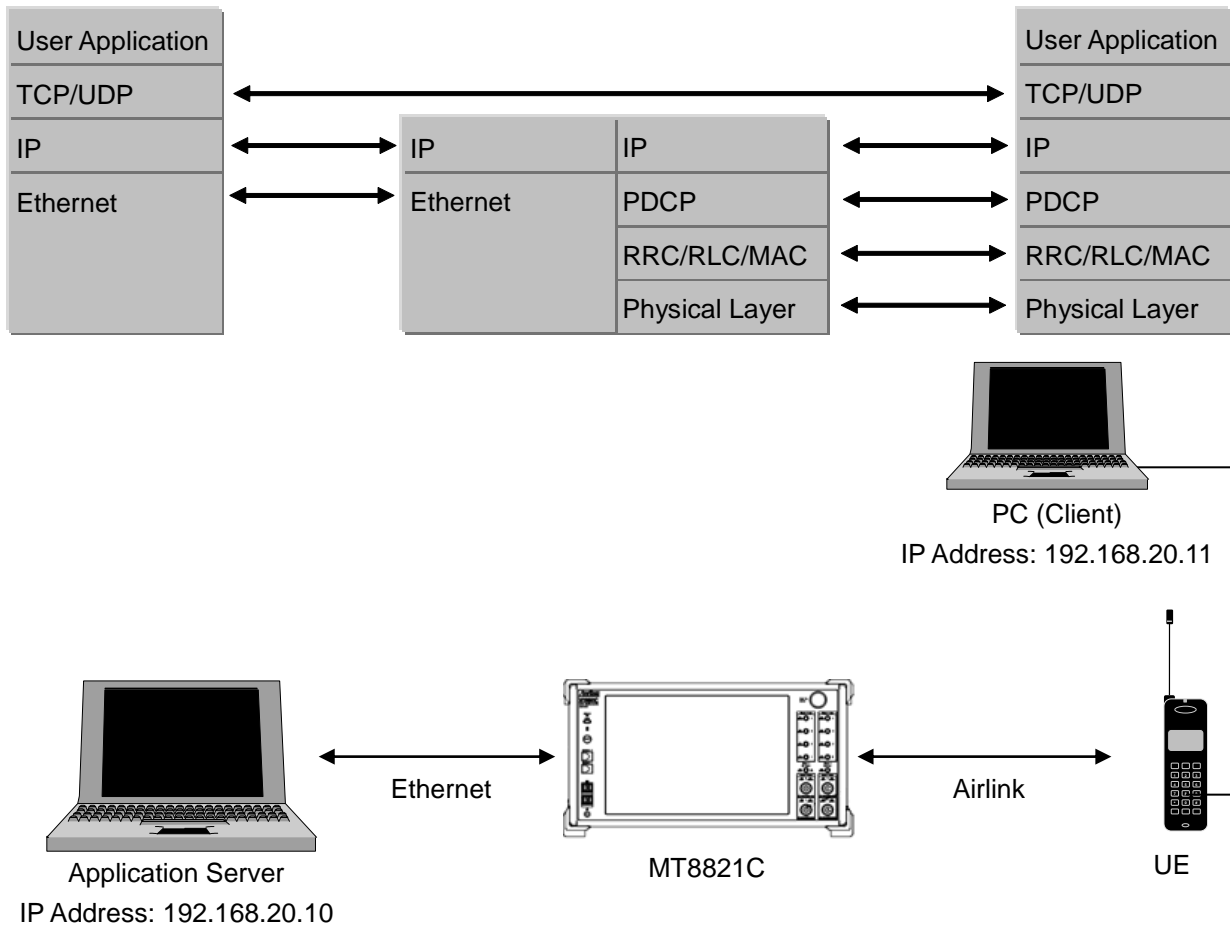
1.1.2. **MX882115C-001**

Chart1.1-12: DC-HSDPA IP Data Transfer

Item	Specifications	
Electrical characteristics	Typical values (typ.) are only for reference and are not guaranteed.	
RF signal generator	Output frequency	300 to 2700 MHz (1 Hz steps)
	Channel	CPICH, P-CCPCH, SCH, PICH, DPCH, S-CCPCH, AICH, HS-SCCH, HS-PDSCH, E-AGCH, E-RGCH, E-HICH, OCNS
Throughput measurement	Function	Measures throughput using IP data transfer
	Measurement target	ACK and NACK on HS-DPCCH
CQI	Function	Measurement reported CQI value from UE
	Measurement target	Periodically reported CQI value applied to HS-DPCCH
Call processing	Call control	Position registration, Call processing using Packet, Network-side disconnection, Terminal-side disconnection (Executes each processing in 3GPP standards)
	UE control	Output level (Executes each UE control in 3GPP standards)

1.2. HSPA Evolution IP Data Transfer Test

The IP data transfer between an application server connected to the MT8821C and a UE (mobile terminal) can be tested by installing the MX882115C/ MX882115C-001 IP Data Transfer option in the MT8821C. Section 1.5.3 and later in the operation manual describe test procedures; refer to the manual for details and GPIB commands.



IP Data Transfer Test Setup Example

<Required Equipment>

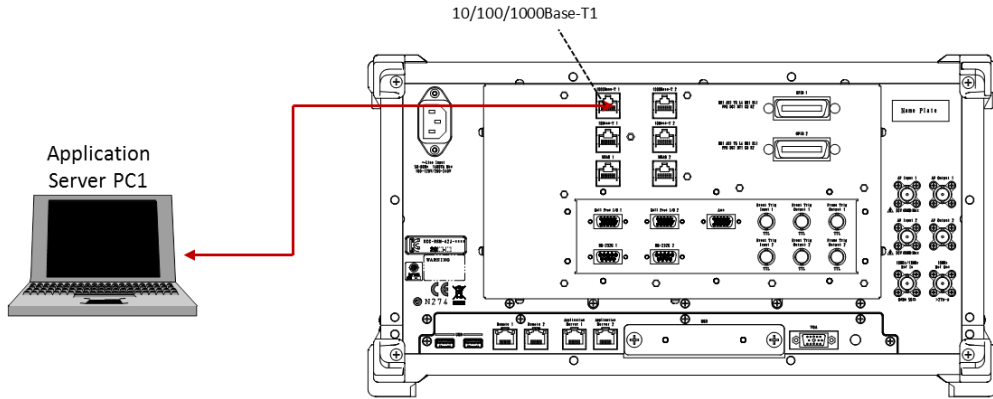
- WCDMA UE supporting IP connection
- RF cable to connect MT8821C and WCDMA UE
- Application server PC with LAN adapter supporting 1000Base-TX
- Client PC
- Cross cable to connect MT8821C and application server
- UDP/TCP Throughput measurement software (installed in application server and client PCs)*¹

*¹: This test uses the open-source software Iperf to measure throughput. It can be downloaded from the Internet. After downloading, copy the execute file (Iperf.exe) to the root of the C: drives in the application server and client PCs.

1.2.1. Setting MT8821C and Application Server

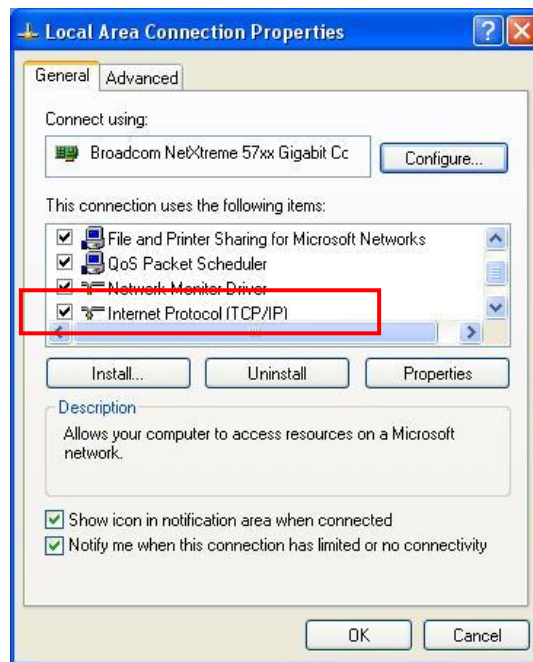
Connect the application server PC and MT8821C and set the IP address of the application server.

1. With the MT8821C power OFF, use a crossover Ethernet cable to connect the 1000Base-TX/100Base-TX/10Base-T port on the back panel of the MT8821C to the application server.



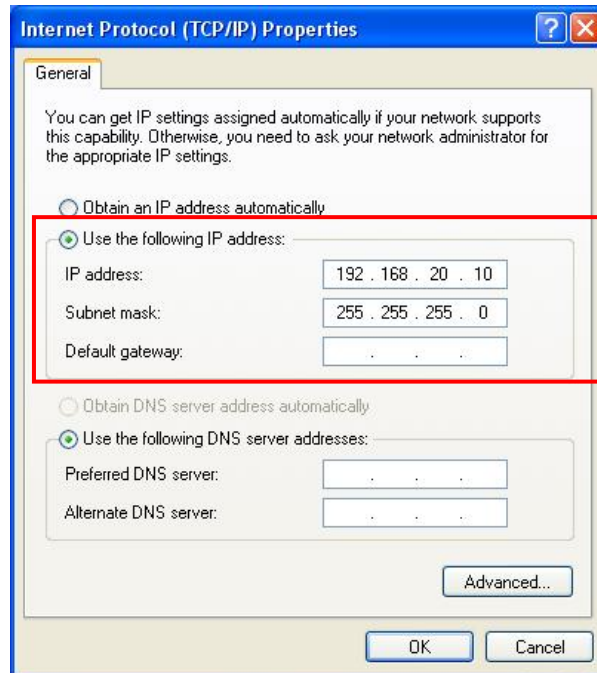
1000Base-TX/100Base-TX/10Base-T Port

2. Open the Local Area Connection Properties window at the application server PC and put a checkmark in the Internet Protocol (TCP/IP) checkbox.



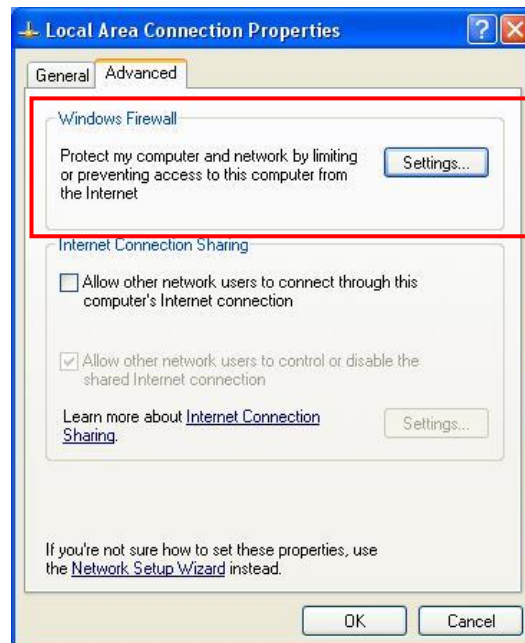
Local Area Network Connection Properties (Windows XP)

3. Double-click Internet Protocol (TCP/IP) to open the Internet Protocol (TCP/IP) Properties window.



Internet Protocol (TCP/IP) Properties Window (Windows XP)

4. Choose **[Use the following IP address]** and set **[IP address]** and **[Subnet mask]** as follows:
IP address: 192.168.20.10
Subnet mask: 255.255.255.0
5. Click **[OK]** to close the Internet Protocol (TCP/IP) Properties window
6. Select the **[Advanced]** tab at the Local Area Connection Properties window and disable the Windows firewall.



Advanced Tab of Local Area Network Connection Properties Window (Windows XP)

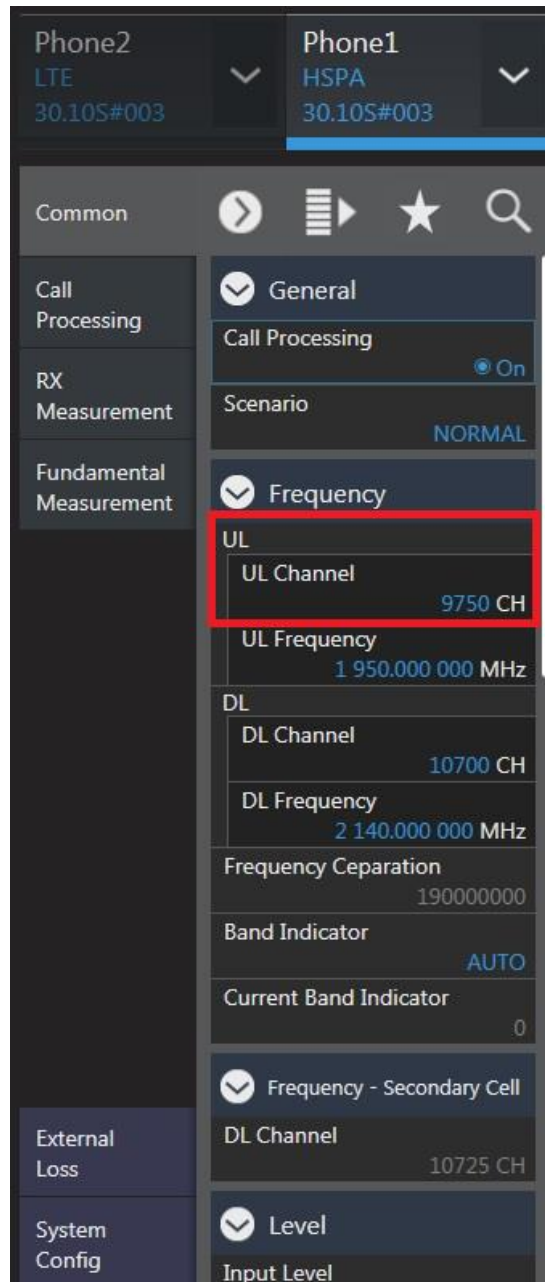
7. Click **[OK]** to close the window.
8. Start the MT8821C.
9. Select and load the HSPA measurement software to Phone1.
10. After loading, start the HSPA measurement software on Phone1.

1.2.2. Setting Client PC

The client PC connection and setting depend on the UE. Set according to the connection method used.

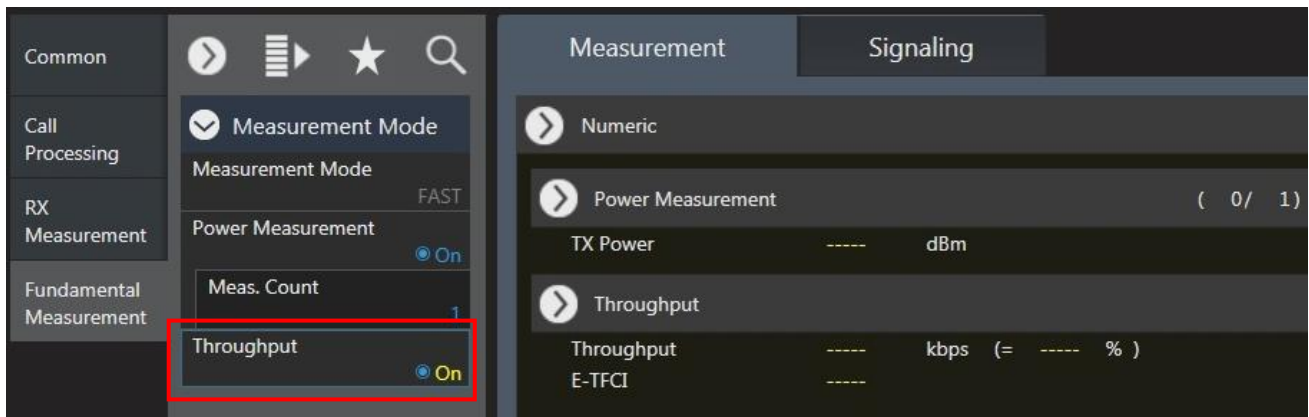
1.2.3. Initial Condition Setting

1. Run **[PRESET]** to initialize the parameter settings.
2. Set **[UL Channel]** to 9750.



UL Channel/Channel Bandwidth Setting at Common Parameter Setting Screen

3. Set [Throughput] at the Fundamental Measurement Parameter screen to On.

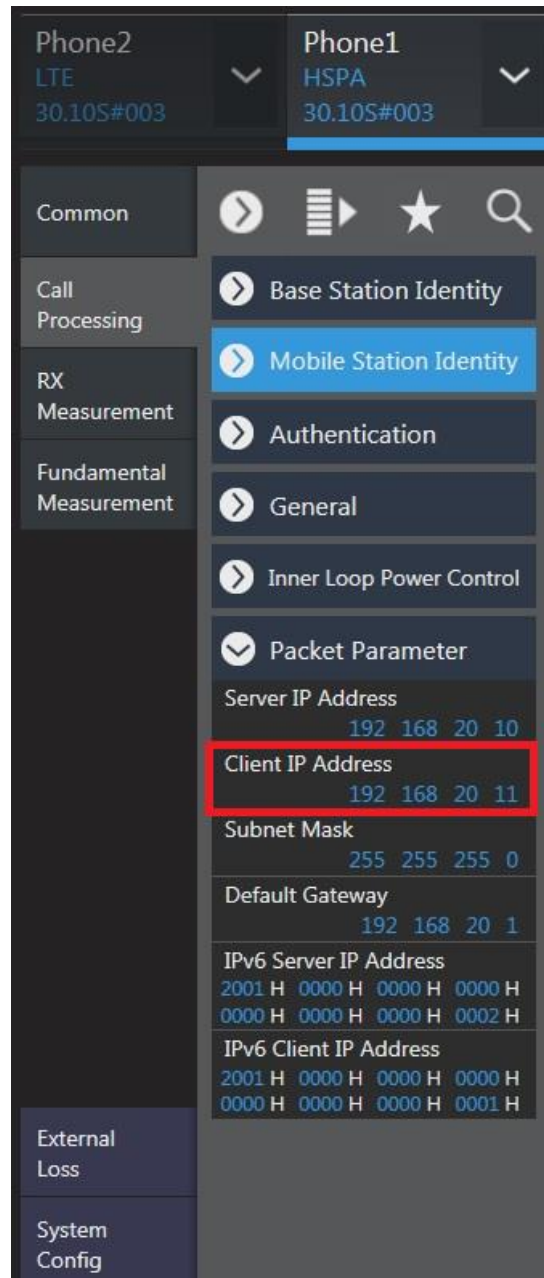


Throughput Measurement Setting at Fundamental Measurement Parameter Screen

1.2.4. Position Registration and Packet Connection

Perform UE position registration and packet connection.

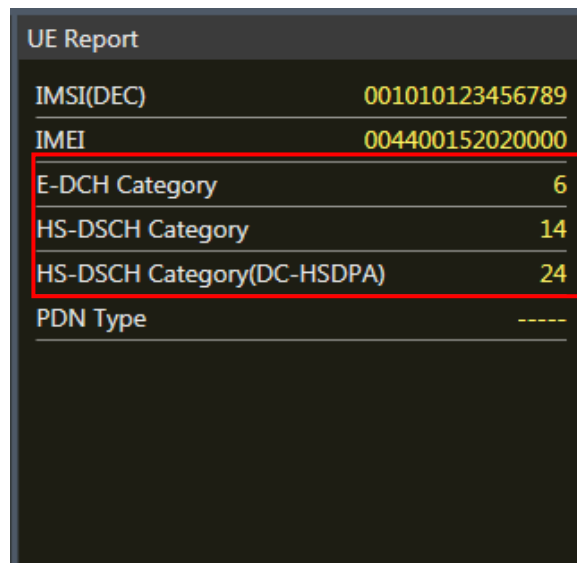
1. Connect the UE to the MT8821C.
2. Set [Client IP Address] to 192.168.20.11.



Client IP Address Setting on Call Processing Parameter Setting Display

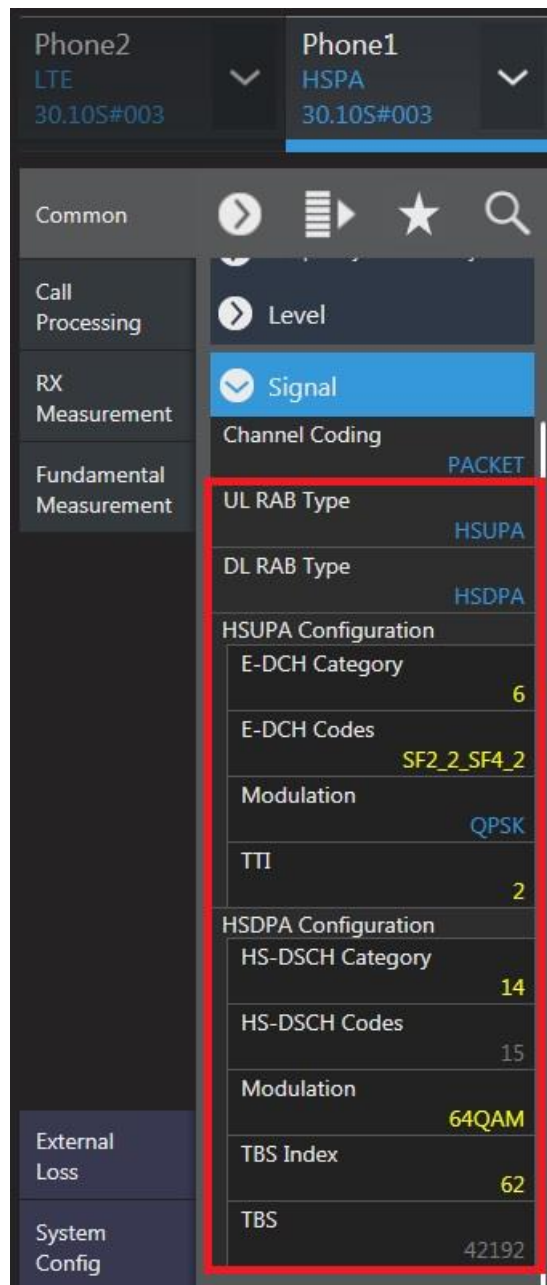
3. Switch on the UE.
The MT8821C Call Processing status changes from Idle→Registration→Idle (regist).

4. After location registration, the category number of the mobile terminal is displayed on the UE Report screen. Set the category number of the packet connection at the Common Parameter setting display. If connecting by DC-HSDPA, set HSDPA at the DL RAB Type parameter and choose the category number.



UE Report	
IMSI(DEC)	001010123456789
IMEI	004400152020000
E-DCH Category	6
HS-DSCH Category	14
HS-DSCH Category(DC-HSDPA)	24
PDN Type	----

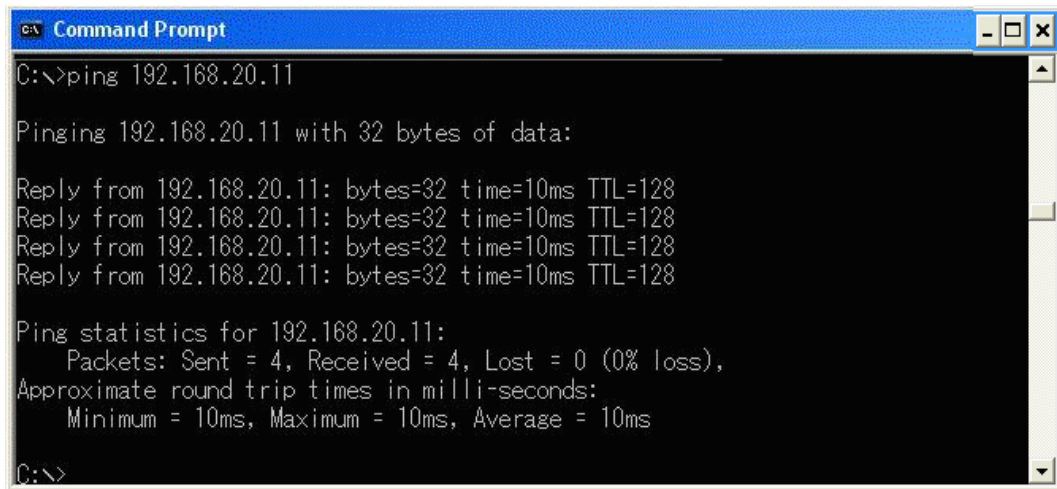
Category Information of Mobile Terminal (UE Report Screen)



Category Setting Screen (Common Parameter Setting Screen)

5. Wait for packet communication from the UE to be established.
The MT8821C Call Processing status changes from Idle(register)→UE Origination→Connected. When the status is Connected, communication is enabled between the application server and client PCs.
6. Press [Single] to set the Input level near to the Tx power measurement result.
If the UE supports Power Control by the TPC, this step can be omitted.

7. Run the Ping command from the Command Prompt window of the client or application server to confirm the IP connection. The following figure shows the result for the application server.



```
C:\>ping 192.168.20.11

Pinging 192.168.20.11 with 32 bytes of data:

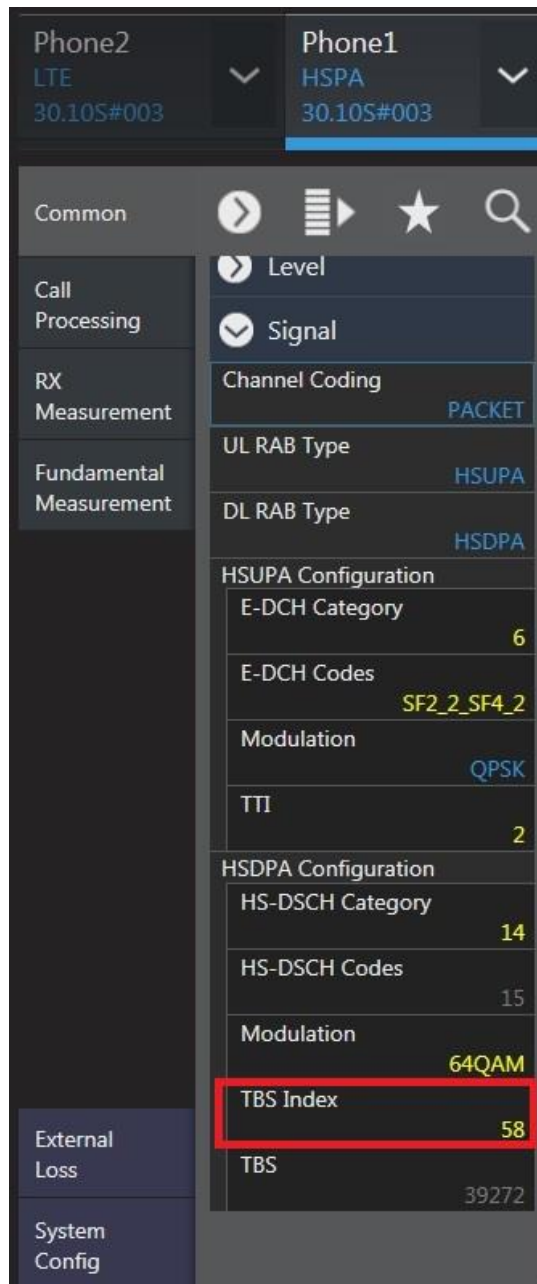
Reply from 192.168.20.11: bytes=32 time=10ms TTL=128
Reply from 192.168.20.11: bytes=32 time=10ms TTL=128
Reply from 192.168.20.11: bytes=32 time=10ms TTL=128
Reply from 192.168.20.11: bytes=32 time=10ms TTL=128

Ping statistics for 192.168.20.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 10ms, Maximum = 10ms, Average = 10ms

C:\>
```

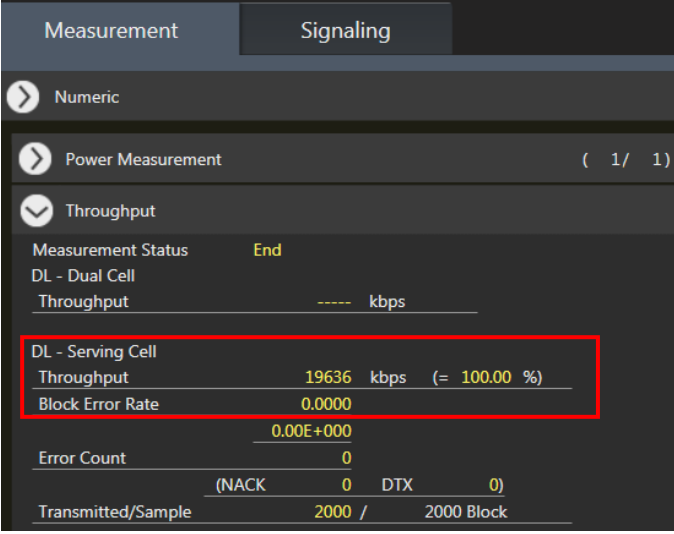
Ping Result at Application Server (Windows XP)

8. Change the Transport Block Size (TBS Index).



Transport Block Size Settings at Common Parameter Setting Screen

9. Press [**Single**] to confirm that the MT8821C is receiving data from the UE at the Throughput and Block Error Rate fields of the Fundamental Measurement Parameter screen.
If there is an error, change the Transport Block Size (TBS Index) setting and repeat steps 8 and 9.



The screenshot shows the 'Fundamental Measurement Parameter' screen with the 'Throughput' section expanded. The 'DL - Serving Cell' section is highlighted with a red box, showing a throughput of 19636 kbps (100.00%) and a block error rate of 0.0000. The 'DL - Dual Cell' section shows a throughput of ----- kbps. The 'Error Count' section shows 0 NACK and 0 DTX. The 'Transmitted/Sample' section shows 2000 / 2000 Block.

Measurement	Value
Measurement Status	End
DL - Dual Cell Throughput	----- kbps
DL - Serving Cell Throughput	19636 kbps (= 100.00 %)
DL - Serving Cell Block Error Rate	0.0000
Error Count	0
(NACK)	0
(DTX)	0
Transmitted/Sample	2000 / 2000 Block


Throughput Measurement Result at Fundamental Measurement Parameter Screen

1.2.5. UDP Throughput Test for IP Data Transfer

This section explains UDP throughput measurements using Iperf for downlink throughput tests. Uplink throughput measurement is supported by switching the application server and client PCs.

[Downlink throughput measurements]

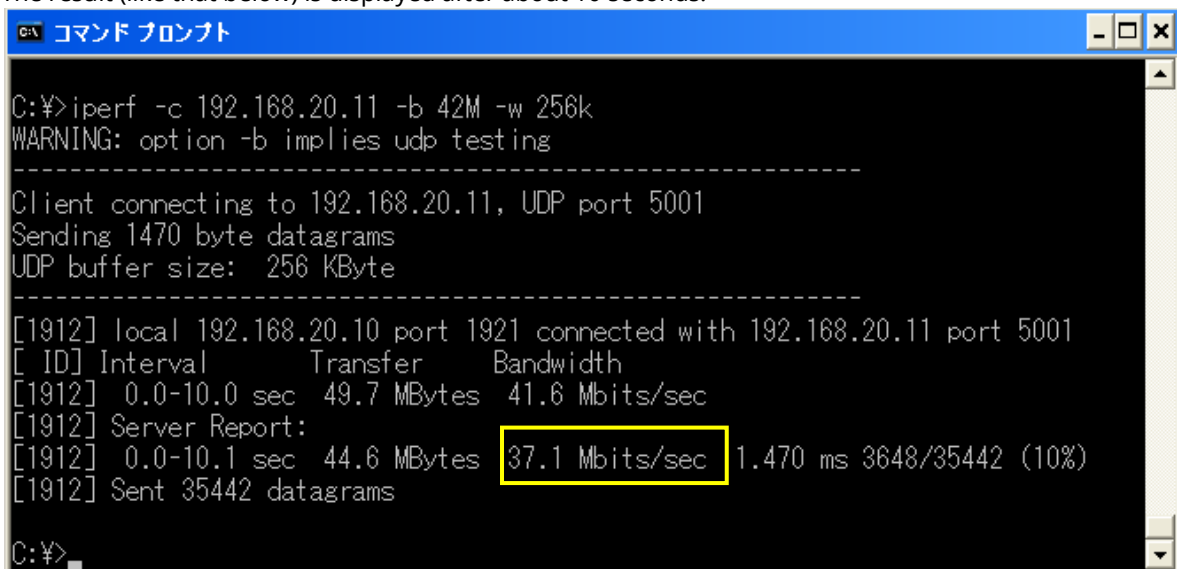
1. Open the Command Prompt window on the client PC and run **[cd c:¥]** to change to the directory with Iperf.exe.
2. Run **[iperf -s -u -w 256k]** to put the client PC into the wait status.



```
C:\¥>iperf -s -u -w 256k
-----
Server listening on UDP port 5001
Receiving 1470 byte datagrams
UDP buffer size: 256 KByte
-----
```

Screen after Running Iperf Command on Client PC (Windows XP)

3. Open the Command Prompt window on the application server and run **[cd c:¥]** to change to the directory with Iperf.exe.
4. Run **[iperf -c 192.168.20.11 -b 42M -w 256k]** to send UDP data from the application server. Although this command uses 42 M, refer to the Throughput measurement result for a rough idea of the value to use with this command.
5. The result (like that below) is displayed after about 10 seconds.



```
C:\¥>iperf -c 192.168.20.11 -b 42M -w 256k
WARNING: option -b implies udp testing
-----
Client connecting to 192.168.20.11, UDP port 5001
Sending 1470 byte datagrams
UDP buffer size: 256 KByte
-----
[1912] local 192.168.20.10 port 1921 connected with 192.168.20.11 port 5001
[ ID] Interval      Transfer      Bandwidth
[1912] 0.0-10.0 sec  49.7 MBytes  41.6 Mbits/sec
[1912] Server Report:
[1912] 0.0-10.1 sec  44.6 MBytes  37.1 Mbits/sec  1.470 ms 3648/35442 (10%)
[1912] Sent 35442 datagrams
C:\¥>
```

Screen after Running Iperf Command on Application Server (Windows XP)

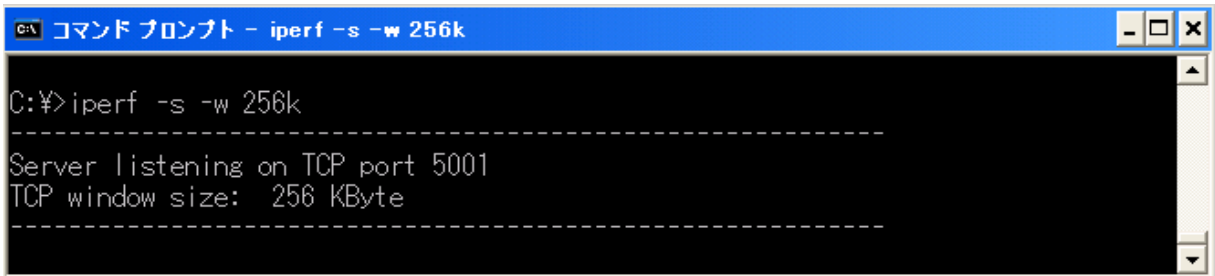
6. Close the Command Prompt windows at the application server and client PCs.

1.2.6. TCP Throughput Test for IP Data Transfer

This section explains TCP throughput measurement using the Iperf software for downlink throughput tests. Uplink throughput measurement is supported by switching the application server and client PCs. Install Iperf at the root of the application server and client PC hard disks.

[Downlink throughput measurement]

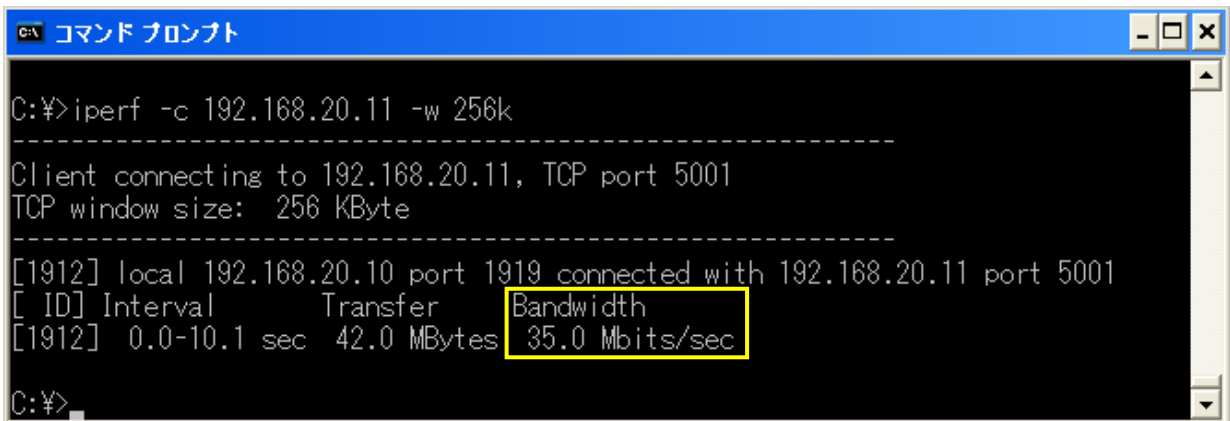
1. Open the Command Prompt window on the client PC and run **[cd c:¥]** to change to the directory with Iperf.exe.
2. Run **[iperf -s -w 256k]** to put the client PC into the wait status.



```
C:\¥>iperf -s -w 256k
-----
Server listening on TCP port 5001
TCP window size: 256 KByte
-----
```

Screen after Running Iperf Command at Client PC (Windows XP)

3. Open the Command Prompt window on the application server and run **[cd c:¥]** to change to the directory with Iperf.exe.
4. Run **[iperf -c 192.168.20.11 -w 256k]** to send TCP data from the application server.
5. The result is displayed after about 10 seconds.



```
C:\¥>iperf -c 192.168.20.11 -w 256k
-----
Client connecting to 192.168.20.11, TCP port 5001
TCP window size: 256 KByte
-----
[1912] local 192.168.20.10 port 1919 connected with 192.168.20.11 port 5001
[ ID] Interval Transfer Bandwidth
[1912] 0.0-10.1 sec 42.0 MBytes 35.0 Mbits/sec
C:\¥>
```

Screen after Running Iperf Command at Application Server (Windows XP)

6. Close the Command Prompt windows at the application server and client PCs.

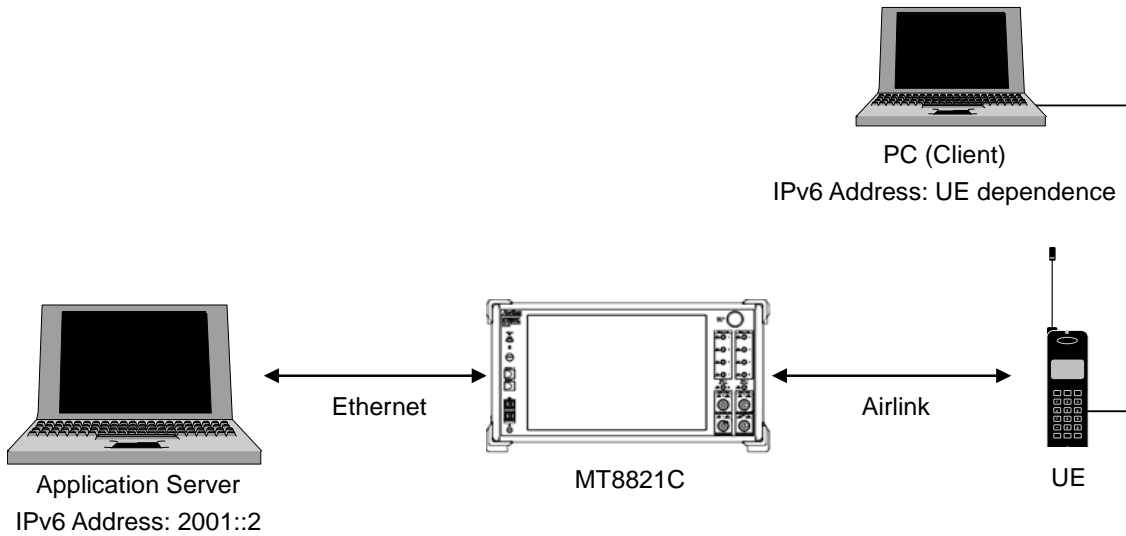
1.2.7. Disconnection

There are two packet disconnection methods.

1. Disconnecting using the client PC or UE. The MT8821C Call Processing status changes from Connected→UE Release→Idle. If the status does not change to UE Release, press **[End Call]** at the MT8821C to disconnect.
2. Disconnecting using **[End Call]**. The Call Processing status changes from Connected→NW Release→Idle.

1.3. IP Data Transfer Test using IPv6

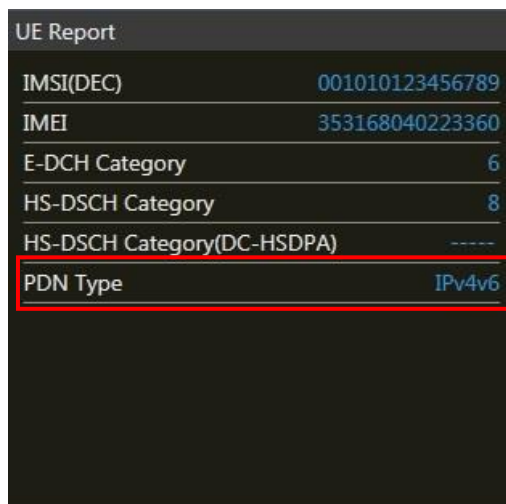
This chapter explains the IP data transfer test procedure using IPv6. It explains the TCP/IP version 6 installation procedure at a PC running Windows XP as well as the server PC settings for Windows XP and Windows 7, and the UDP throughput validation procedure using IPv6.



Setup for IP Data Transfer Test

NOTES:

- There is no need to connect the server PC and MT8821C with the router when testing IP data transfer using IPv6. Connect the server PC and MT8821C as shown above.
- The IPv6 address is assigned automatically to the UE being used. A UE not supporting automatic IPv6 address assignment uses the IP address set at IPv6Client IP Address of the MT8821C.
- Check that the UE supports IPv6 before testing IP data transfer using IPv6. Connect the UE and MT8821C to check PDN Type on the UE Report screen. The UE supports IPv6 when either IPv4v6 or IPv6 is displayed in PDN Type on the UE Report screen.

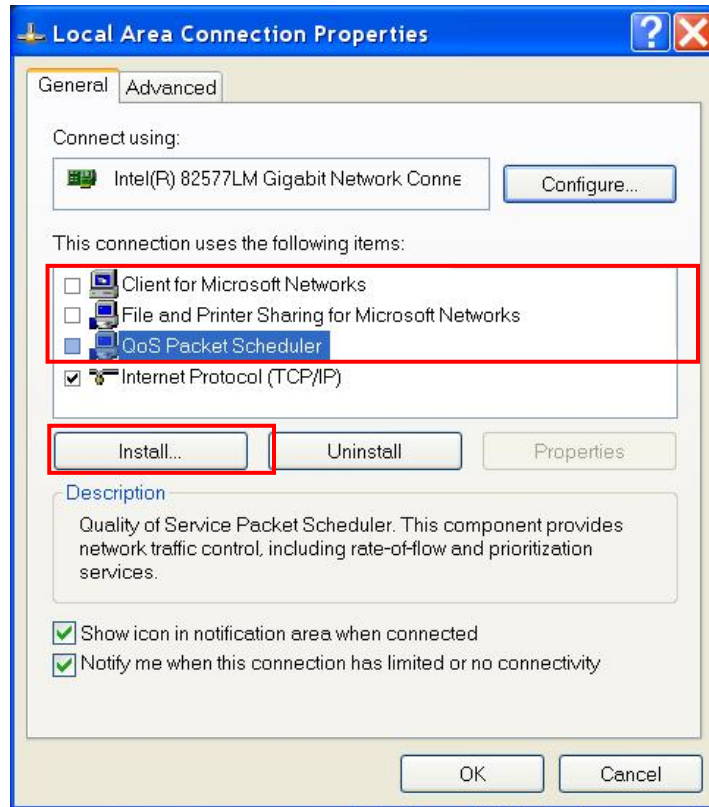


UE Report Screen

1.3.1. TCP/IP Version 6 Installation (Windows XP server/client PC only)

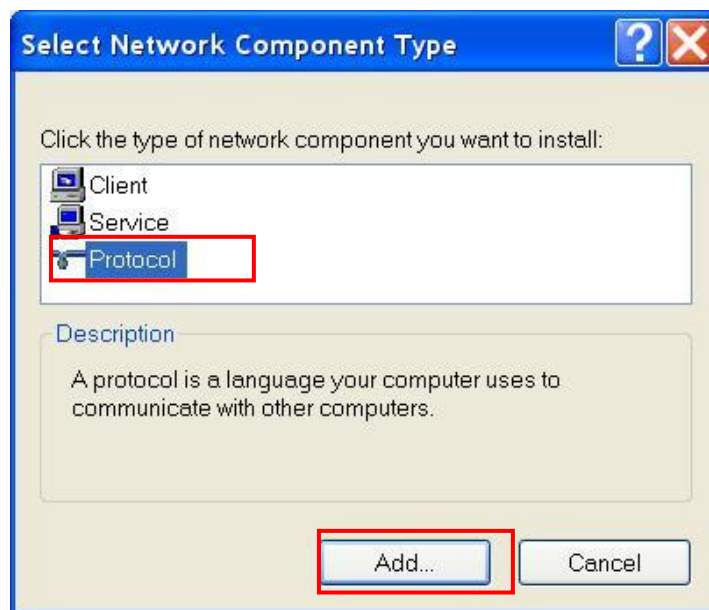
The following procedure is only for a Windows XP PC in which TCP/IP Version 6 is not installed.

1. Open the Local Area Connection Properties screen of the server/client PC and uncheck the following items.
 - Microsoft Client for Network
 - Microsoft File and Printer sharing for Network
 - QoS Packet Scheduler



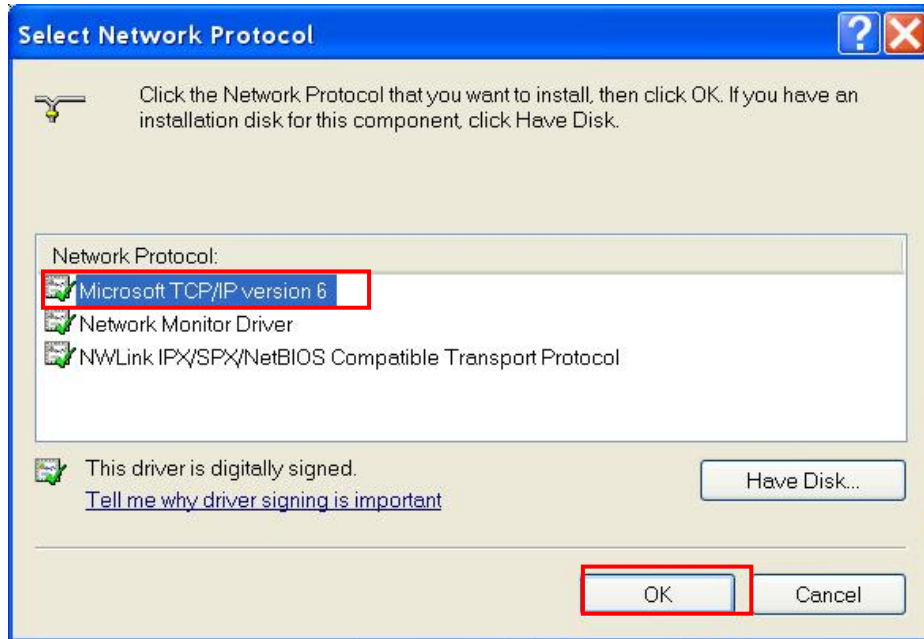
Local Area Connection Properties Screen (Windows XP)

2. Click the [Install] button to open the following Network Component Type Selection screen.



Network Component Type Selection Screen (Windows XP)

3. Select [**Protocol**] and click the [**Add**] button to open the following Select Network Protocol screen.



Network Protocol Selection Screen (Windows XP)

4. Select [**Microsoft TCP/IP version 6**] and click the [**OK**] button to complete the TCP/IP version 6 installation.

1.3.2. Server PC Connection and Setting (Windows XP)

Connect the MT8821C and server PC to set TCP/IP for the server PC.

1. Turn off the MT8821C power and connect the 1000Base-TX/100Base-TX/10Base-T port 1 on the back panel to the server PC using a crossover Ethernet cable.
2. Open the Windows Command Prompt application.
3. Run the "ipconfig" command to check the server PC IP configuration.

```

C:\> Command Prompt

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    IP Address. . . . . : 192.168.20.100
    Subnet Mask . . . . . : 255.255.255.0
    IP Address. . . . . : fe80::20f:1fff:fed2:a341%5
    Default Gateway . . . . . : 192.168.20.1

Tunnel adapter Teredo Tunneling Pseudo-Interface:

    Connection-specific DNS Suffix  . : 
    IP Address. . . . . : fe80::ffff:ffff:fffd%4
    Default Gateway . . . . . : 

Tunnel adapter Automatic Tunneling Pseudo-Interface:

    Connection-specific DNS Suffix  . : 
    IP Address. . . . . : fe80::5efe:192.168.20.100%2
    Default Gateway . . . . . : 

C:\>

```

Server PC IP Configuration Screen (Windows XP)

4. Run the “netsh int ipv6 show int” command and confirm the Index No. (Idx) allocated to the Local Area Connection. This Index No. is required at the next step to set the IP address.

```

C:\> Command Prompt

Tunnel adapter Automatic Tunneling Pseudo-Interface:

    Connection-specific DNS Suffix  . : 
    IP Address. . . . . : fe80::5efe:192.168.20.100%2
    Default Gateway . . . . . : 

C:\>netsh int ipv6 show int
Querying active state...

Idx  Met  MTU  State          Name
---  ---  ---  ---          -
5    0   1500  Connected     Local Area Connection
4    2   1280  Disconnected  Teredo Tunneling Pseudo-Interface
3    1   1280  Connected     6to4 Pseudo-Interface
2    1   1280  Connected     Automatic Tunneling Pseudo-Interface
1    0   1500  Connected     Loopback Pseudo-Interface

C:\>

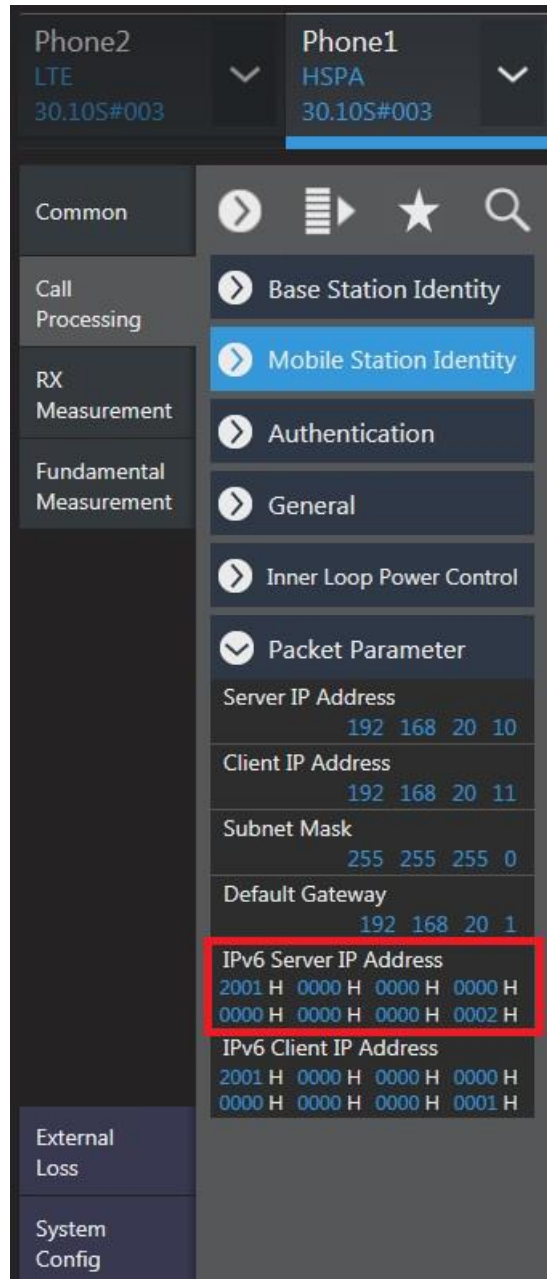
```

Query Result for Index No. Screen (Windows XP)

- Run the "netsh int ipv6 set address 5 2001::2" command to set the IP address. The IP address set by this procedure is set to match the address set at [IPv6 Server IP Address] of the MT8821C.

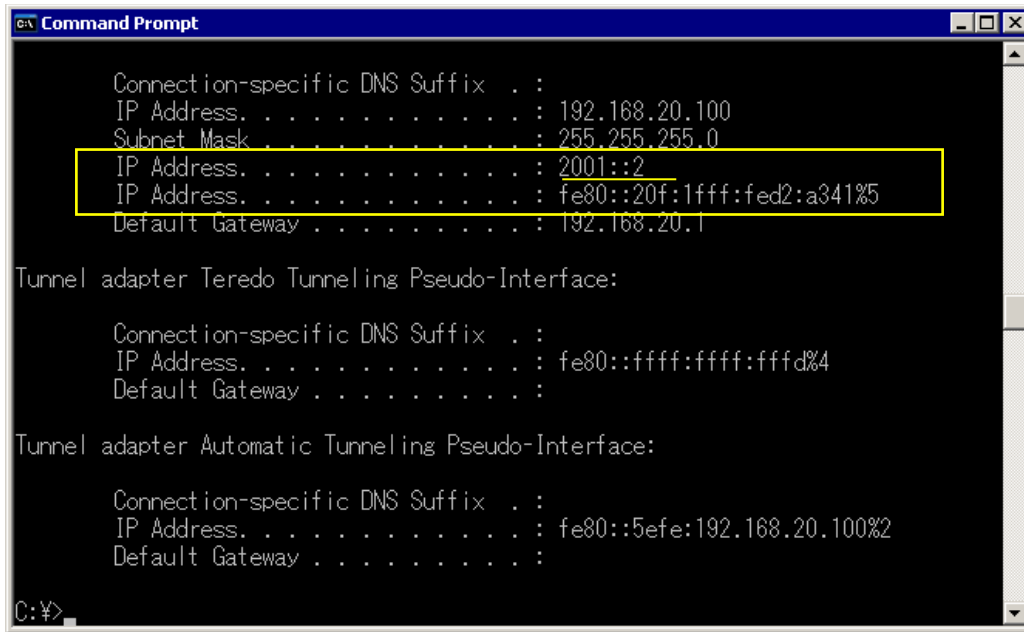
NOTES:

- Places with contiguous 0s in the IPv6 Server IP Address captured at Index No IP Address of step 4 'netsh int ipv6 set' are abbreviated as ::. For example IPv6 Server IP Address 2001:0000:0000:0000:0000:0000:0002 displayed in the following screen is abbreviated to 2001::2.



IPv6 Address Setting Screen

6. Run the "ipconfig" command again to check that the IP address set at step 5 has been set correctly.



Server PC IP Configuration after IP Address Setting (Windows XP)

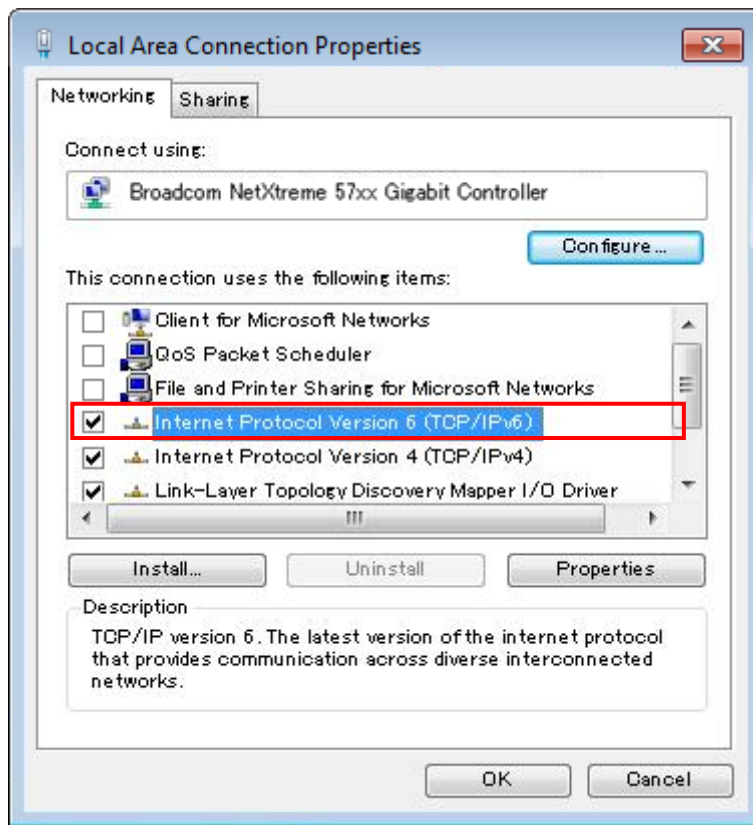
1.3.3. Server PC Connection and Setting (Windows 7/Vista)

Connect the MT8821C and server PC to set TCP/IP for the server PC.

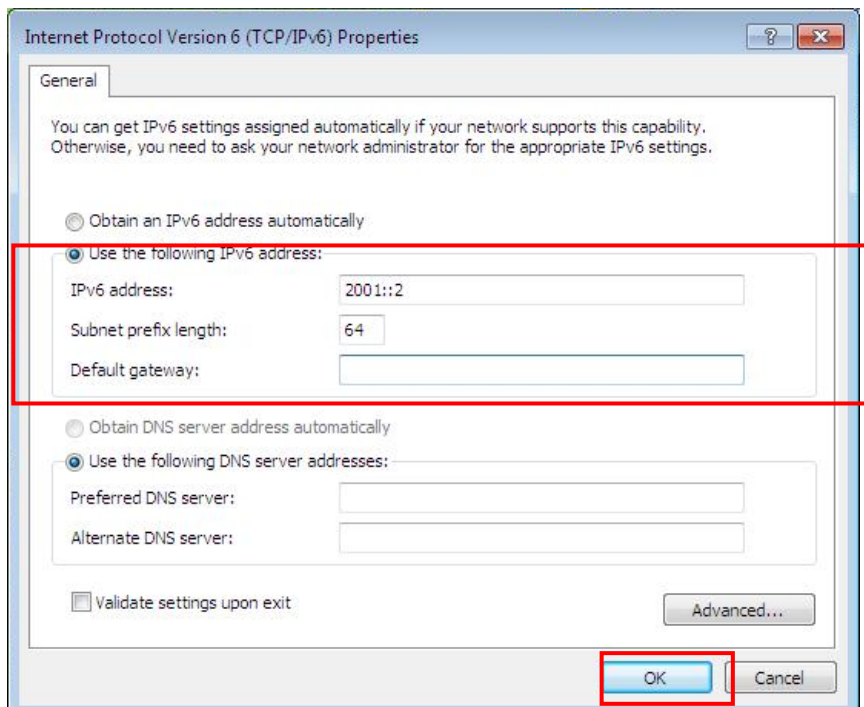
NOTE:

- **The TCP/IP version 6 installation procedure is not required.**
- **Disable the Windows firewall.**

1. Turn off the MT8821C power and connect the 1000Base-TX/100Base-TX/10Base-T port 1 on the back panel to the server PC using a crossover Ethernet cable.
2. Open the Local Area Connection properties screen of the server/client PC and uncheck the following items.
 - Microsoft Client for Network
 - Microsoft File and Printer sharing for Network
 - QoS Packet Scheduler
3. Double-click [**Internet Protocol Version 6 (TCP/IPv6)**] to open the Internet Protocol Version 6 (TCP/IPv6) Properties screen.



Local Area Connection Properties Screen (Windows 7)

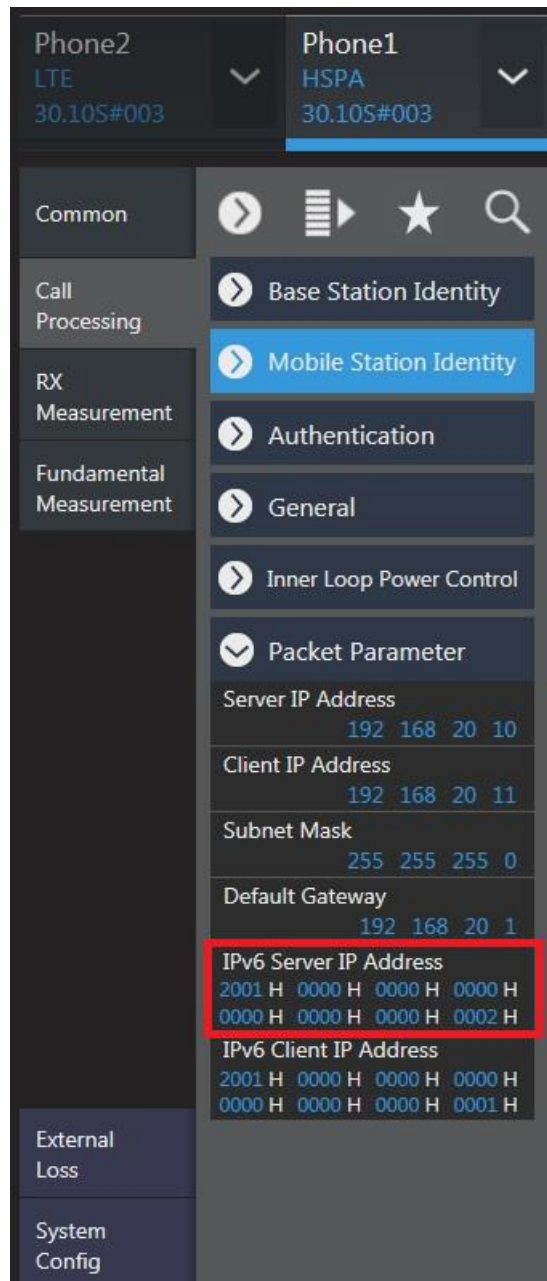


Internet Protocol Version 6 (TCP/IPv6) Properties Screen (Windows 7)

4. Select [**Use following IPv6 address**] and set [**IPv6 address**] and [**Subnet prefix length**] as described below. The IPv6 address set by this procedure matches the IP address set at [**IPv6 Server IP Address**] of the MT8821C.
 - IPv6 address: 2001::2
 - Subnet prefix length: 64

NOTE:

- **Places in the address with contiguous 0s are abbreviated as ::. For example, IPv6 Server IP Address 2001:0000:0000:0000:0000:0000:0002 is abbreviated to 2001::2.**

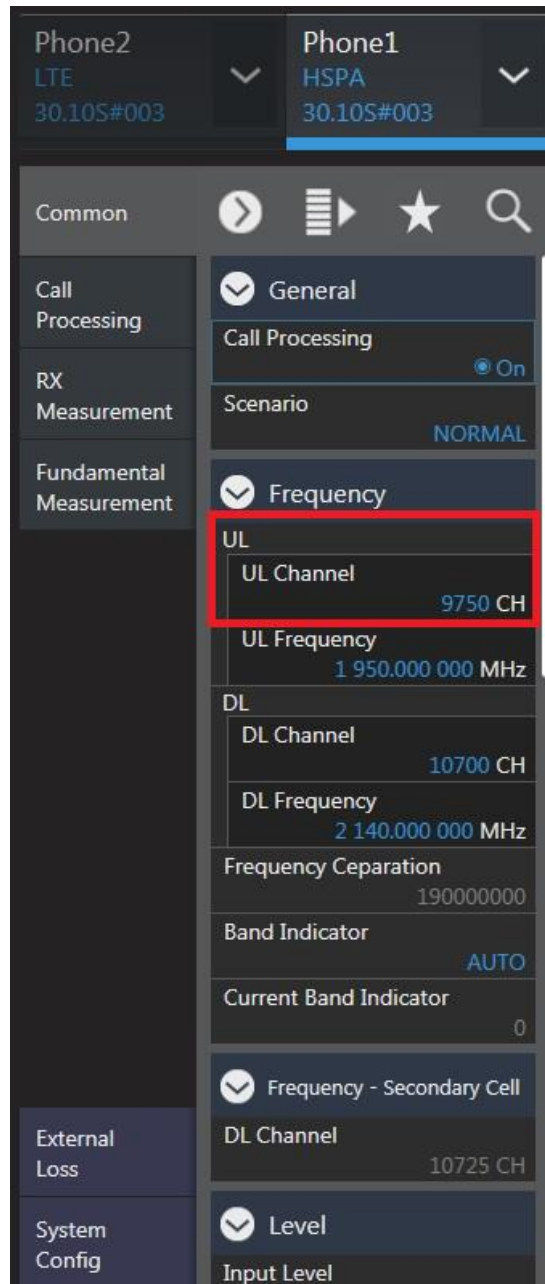


IPv6 Address Setting Screen

5. Click [**OK**] and close the properties screen for Internet Protocol Version 6 (TCP/IPv6).

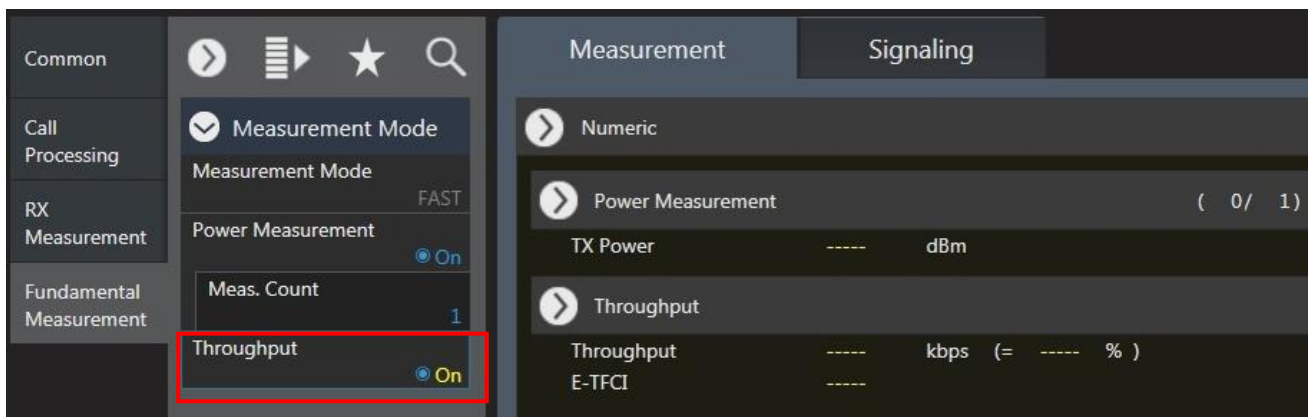
1.3.4. Initial Condition Setting when Using IPv6

1. Run "Preset" to set the initial parameters.
2. Set [UL Channel] to 9750.



UL Channel/Channel Bandwidth Setting Screen (Common Parameter Setting)

3. Set [Throughput] at the Fundamental Measurement Parameter screen to On.

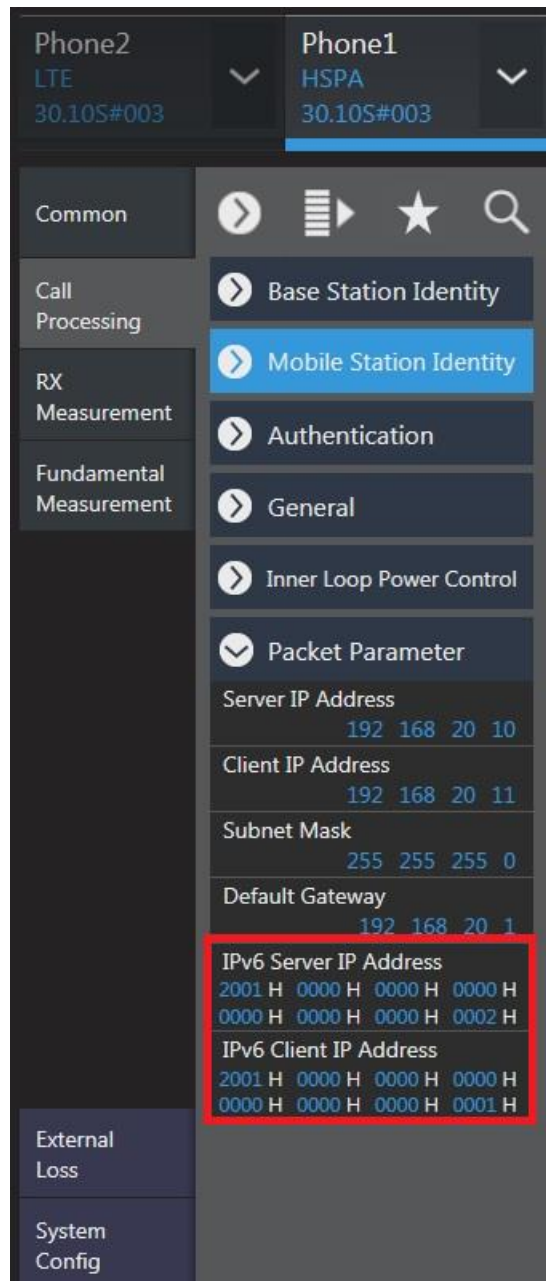


Throughput Measurement Setting Screen (Fundamental Measurement Parameter Setting)

1.3.5. Position Registration and Packet Connection Establishment when Using IPv6

Position registration of UE and packet connection.

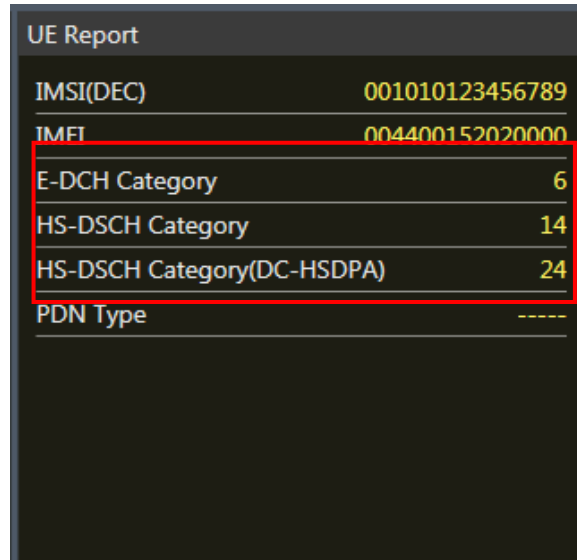
1. Connect the UE and MT8821C.
2. Set [IPv6 Server IP Address] to 2001::2.
3. Set [IPv6 Client IP Address] to 2001::1.



IPv6 Address Setting at Call Processing Parameter Setting Screen

4. Switch on the UE.
The MT8821C Call Processing status changes from Idle→Registration→Idle (regist).

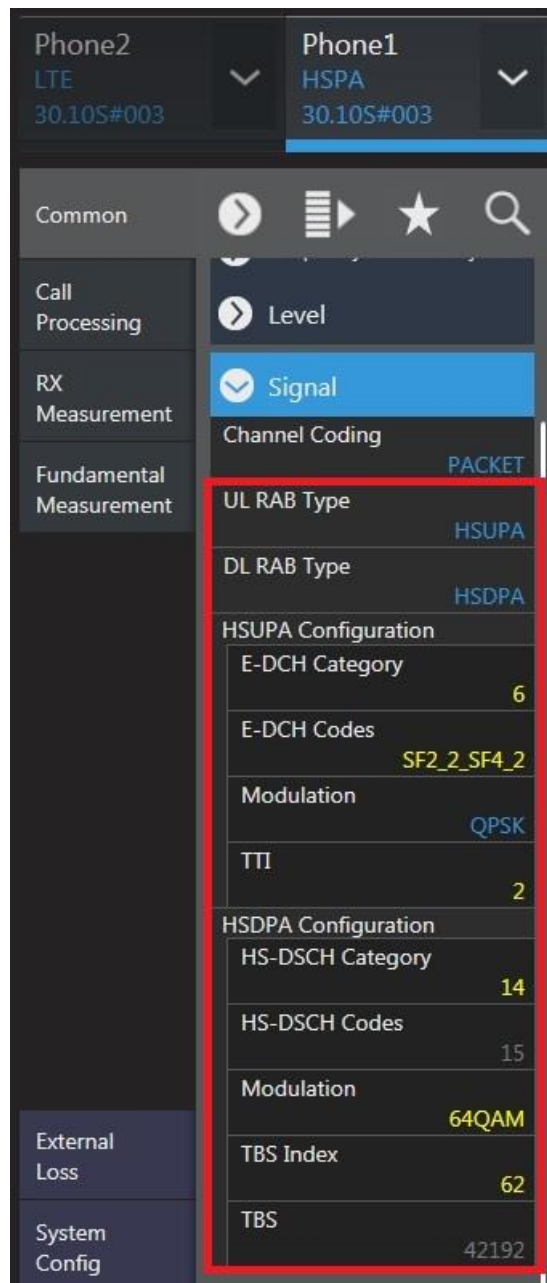
5. After location registration, the category number of the UE is displayed on the UE Report screen. Set the category number of the packet connection on the Common Parameter setting display. If connecting by DC-HSDPA, set HSDPA on DL RAB Type parameter and choose the category number.



The image shows a screenshot of a 'UE Report' screen. The screen has a dark background with white text. The title 'UE Report' is at the top. Below it, several parameters are listed with their corresponding values. A red rectangular box highlights the 'E-DCH Category', 'HS-DSCH Category', and 'HS-DSCH Category(DC-HSDPA)' rows. The values for these categories are 6, 14, and 24 respectively. The 'PDN Type' row shows a value of '----'.

Parameter	Value
IMSI(DEC)	001010123456789
IMEI	004400152020000
E-DCH Category	6
HS-DSCH Category	14
HS-DSCH Category(DC-HSDPA)	24
PDN Type	----

Category Information of Mobile Terminal (UE Report Screen)



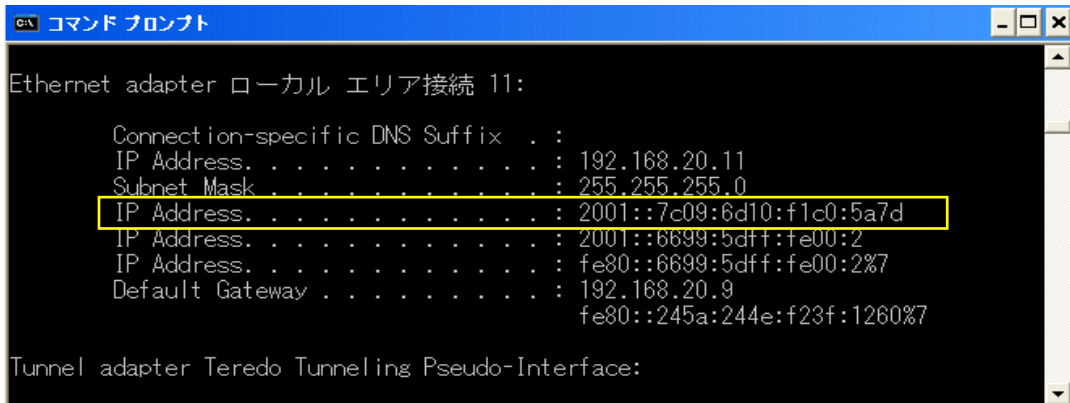
Category Setting Screen (Common Parameter Setting Screen)

6. Establish a packet connection from the UE.
Wait until the MT8821C Call Processing changes to Idle(register)→UE Origination →Connected. When the status is Connected, communication is enabled between the application server and client PCs.
7. Press the **[Single]** key to set "Input level" close to the Tx Power measurement result.
This step not required if the UE supports Power Control by TPC.

8. Open a Command Prompt window at the client PC and run the “ipconfig” command. As shown below, the IPv6 address of the UE starts with the prefix 2001 and has a different Interface ID from the Local Link address.

NOTES:

- **Interface ID specifies the least-significant 64 bit of the IPv6 address.**
- **The IP address starting with 2001::xxxx:xxxx:xxxx:xxxx at the Command Prompt screen shown below, is called the Global address. On the other hand, the IP address starting with fe80::xxxx:xxxx:xxxx:xxxx is called the Local Link address.**
- **A UE not supporting automatic IPv6 address assignment uses the IP address set at IPv6Client IP Address of the MT8821C.**



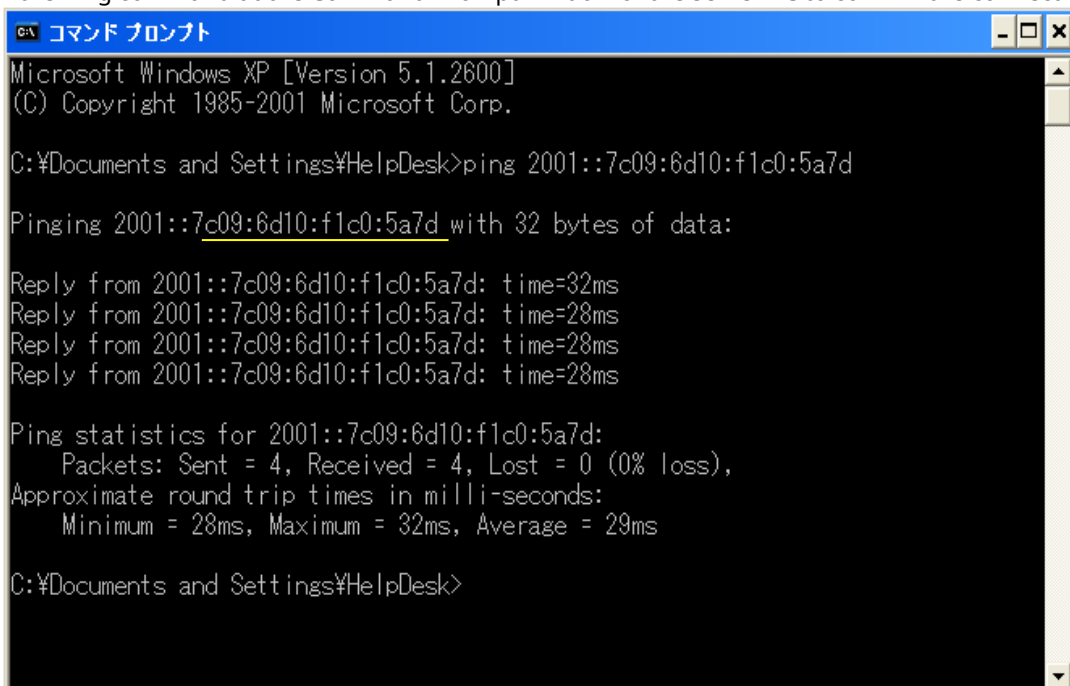
```
コマンド プロンプト
Ethernet adapter ローカル エリア接続 11:

    Connection-specific DNS Suffix  . : 
    IP Address. . . . . : 192.168.20.11
    Subnet Mask . . . . . : 255.255.255.0
    IP Address. . . . . : 2001::7c09:6d10:f1c0:5a7d
    IP Address. . . . . : 2001::6699:5dff:fe00:2
    IP Address. . . . . : fe80::6699:5dff:fe00:2%7
    Default Gateway . . . . . : 192.168.20.9
                                fe80::245a:244e:f23f:1260%7

Tunnel adapter Teredo Tunneling Pseudo-Interface:
```

Client PC IP Configuration (Windows XP)

9. Run the Ping command at the Command Prompt window of the server PC to confirm the connection status.



```
コマンド プロンプト
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\HelpDesk>ping 2001::7c09:6d10:f1c0:5a7d

Pinging 2001::7c09:6d10:f1c0:5a7d with 32 bytes of data:

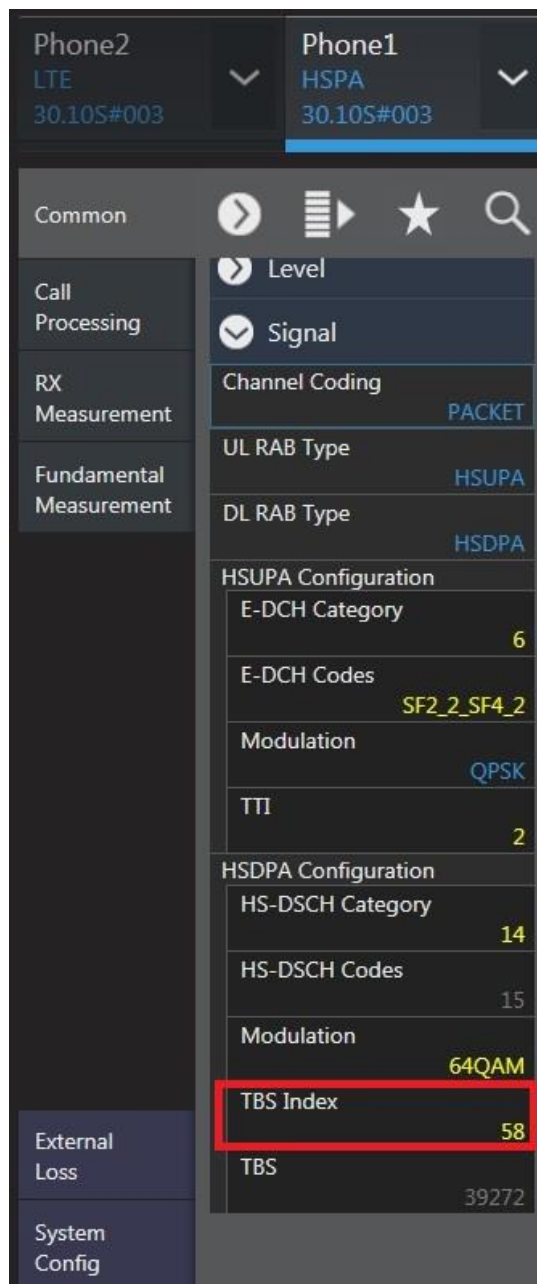
Reply from 2001::7c09:6d10:f1c0:5a7d: time=32ms
Reply from 2001::7c09:6d10:f1c0:5a7d: time=28ms
Reply from 2001::7c09:6d10:f1c0:5a7d: time=28ms
Reply from 2001::7c09:6d10:f1c0:5a7d: time=28ms

Ping statistics for 2001::7c09:6d10:f1c0:5a7d:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 28ms, Maximum = 32ms, Average = 29ms

C:\Documents and Settings\HelpDesk>
```

Result of Pinging Client PC from Server PC (Windows XP)

10. Change the Transport Block Size (TBS Index).



Transport Block Size Setting (Common Parameter Setting Screen)


11. Press the **[Single]** key to check the UE Rx status from Throughput and Block Error Rate at the Fundamental Measurement screen. If an error occurs, change the above Transport Block Size (TBS Index) settings and repeat steps 10 to 11 until the Rx status becomes optimum.

Measurement		Signaling	
Numeric			
Power Measurement		(1 / 1)	
Throughput			
Measurement Status	End		
DL - Dual Cell			
Throughput	---- kbps		
DL - Serving Cell			
Throughput	19636	kbps	(= 100.00 %)
Block Error Rate	0.0000		
	0.00E+000		
Error Count	0		
	(NACK	0	DTX 0)
Transmitted/Sample	2000 / 2000 Block		

Throughput Measurement Result Screen (Fundamental Measurement)

1.3.6. IP Data Transfer TCP Throughput Verification when Using IPv6

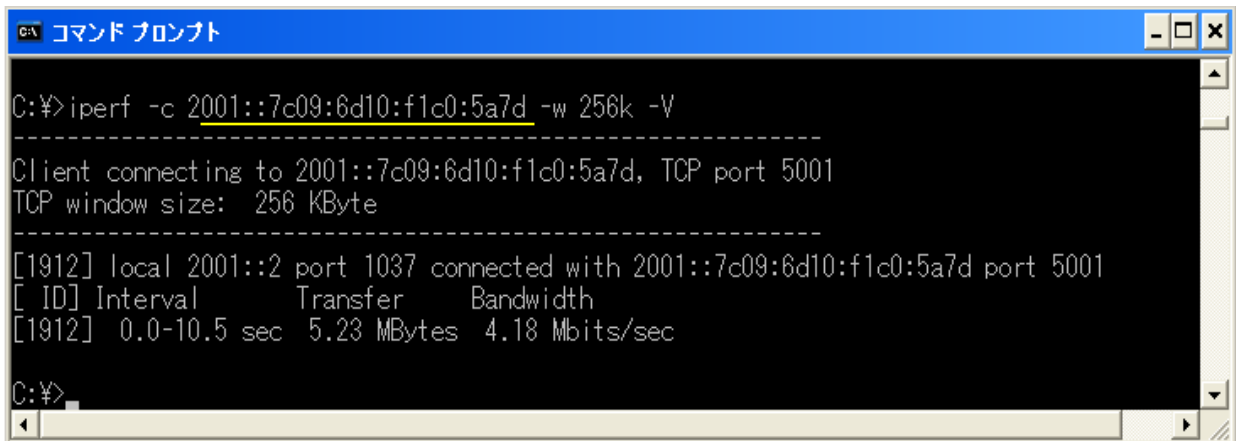
1. Open the client PC Command Prompt screen and run the command "cd c:¥" to move to the directory where Iperf.exe is installed.
2. Run the "iperf -s -w 256k -V" command to enter the wait mode and receive data from the server PC.



```
コマンド プロンプト - iperf -s -w 256k -V
C:¥>iperf -s -w 256k -V
-----
Server listening on TCP port 5001
TCP window size: 256 KByte
-----
```

Running Iperf Command at Client PC Command Prompt Screen (Windows XP)

3. Open the server PC Command Prompt screen and run the "cd c:¥" command to move to the directory where Iperf.exe is installed.
4. Run the "iperf -c 2001::7c09:6d10:f1c0:5a7d -w 256k -V" command to send TCP data from the server PC.



```
コマンド プロンプト
C:¥>iperf -c 2001::7c09:6d10:f1c0:5a7d -w 256k -V
-----
Client connecting to 2001::7c09:6d10:f1c0:5a7d, TCP port 5001
TCP window size: 256 KByte
-----
[1912] local 2001::2 port 1037 connected with 2001::7c09:6d10:f1c0:5a7d port 5001
[ ID] Interval      Transfer    Bandwidth
[1912] 0.0-10.5 sec  5.23 MBytes 4.18 Mbits/sec
C:¥>
```

Running Iperf Command at Server PC Command Prompt Screen and TCP Measurement Result (Windows XP)

NOTE:

- **UDP throughput validation using IPv6 is basically the same procedure as testing with IPv4. Simply add the -V option when executing the Iperf command.**

* Windows is registered trademark of Microsoft Corporation in the USA and other countries.

Note

• United States

Anritsu Company

1155 East Collins Blvd., Suite 100, Richardson,
TX 75081, U.S.A.
Toll Free: 1-800-267-4878
Phone: +1-972-644-1777
Fax: +1-972-671-1877

• Canada

Anritsu Electronics Ltd.

700 Silver Seven Road, Suite 120, Kanata,
Ontario K2V 1C3, Canada
Phone: +1-613-591-2003
Fax: +1-613-591-1006

• Brazil

Anritsu Eletrônica Ltda.

Praça Amadeu Amaral, 27 - 1 Andar
01327-010 - Bela Vista - São Paulo - SP - Brazil
Phone: +55-11-3283-2511
Fax: +55-11-3288-6940

• Mexico

Anritsu Company, S.A. de C.V.

Av. Ejército Nacional No. 579 Piso 9, Col. Granada
11520 México, D.F., México
Phone: +52-55-1101-2370
Fax: +52-55-5254-3147

• United Kingdom

Anritsu EMEA Ltd.

200 Capability Green, Luton, Bedfordshire, LU1 3LU, U.K.
Phone: +44-1582-433200
Fax: +44-1582-731303

• France

Anritsu S.A.

12 avenue du Québec, Bâtiment Iris 1-Silic 612,
91140 VILLEBON SUR YVETTE, France
Phone: +33-1-60-92-15-50
Fax: +33-1-64-46-10-65

• Germany

Anritsu GmbH

Nemetschek Haus, Konrad-Zuse-Platz 1
81829 München, Germany
Phone: +49-89-442308-0
Fax: +49-89-442308-55

• Italy

Anritsu S.r.l.

Via Elio Vittorini 129, 00144 Roma, Italy
Phone: +39-6-509-9711
Fax: +39-6-502-2425

• Sweden

Anritsu AB

Kistagången 20B, 164 40 KISTA, Sweden
Phone: +46-8-534-707-00
Fax: +46-8-534-707-30

• Finland

Anritsu AB

Teknobulevardi 3-5, FI-01530 VANTAA, Finland
Phone: +358-20-741-8100
Fax: +358-20-741-8111

• Denmark

Anritsu A/S

Kay Fiskers Plads 9, 2300 Copenhagen S, Denmark
Phone: +45-7211-2200
Fax: +45-7211-2210

• Russia

Anritsu EMEA Ltd.

Representation Office in Russia

Tverskaya str. 16/2, bld. 1, 7th floor.
Moscow, 125009, Russia
Phone: +7-495-363-1694
Fax: +7-495-935-8962

• Spain

Anritsu EMEA Ltd.

Representation Office in Spain

Edificio Cuzco IV, Po. de la Castellana, 141, Pta. 8
28046, Madrid, Spain
Phone: +34-915-726-761
Fax: +34-915-726-621

• United Arab Emirates

Anritsu EMEA Ltd.

Dubai Liaison Office

P O Box 500413 - Dubai Internet City
Al Thuraya Building, Tower 1, Suit 701, 7th Floor
Dubai, United Arab Emirates
Phone: +971-4-3670352
Fax: +971-4-3688460

• India

Anritsu India Private Limited

2nd & 3rd Floor, #837/1, Binnamangla 1st Stage,
Indiranagar, 100ft Road, Bangalore - 560038, India
Phone: +91-80-4058-1300
Fax: +91-80-4058-1301

• Singapore

Anritsu Pte. Ltd.

11 Chang Charn Road, #04-01, Shriro House
Singapore 159640
Phone: +65-6282-2400
Fax: +65-6282-2533

• P.R. China (Shanghai)

Anritsu (China) Co., Ltd.

Room 2701-2705, Tower A,
New Caohejing International Business Center
No. 391 Gui Ping Road Shanghai, 200233, P.R. China
Phone: +86-21-6237-0898
Fax: +86-21-6237-0899

• P.R. China (Hong Kong)

Anritsu Company Ltd.

Unit 1006-7, 10/F., Greenfield Tower, Concordia Plaza,
No. 1 Science Museum Road, Tsim Sha Tsui East,
Kowloon, Hong Kong, P.R. China
Phone: +852-2301-4980
Fax: +852-2301-3545

• Japan

Anritsu Corporation

8-5, Tamura-cho, Atsugi-shi, Kanagawa, 243-0016 Japan
Phone: +81-46-296-6509
Fax: +81-46-225-8359

• Korea

Anritsu Corporation, Ltd.

5FL, 235 Pangyoyeok-ro, Bundang-gu, Seongnam-si,
Gyeonggi-do, 463-400 Korea
Phone: +82-31-696-7750
Fax: +82-31-696-7751

• Australia

Anritsu Pty. Ltd.

Unit 21/270 Ferntree Gully Road, Notting Hill,
Victoria 3168, Australia
Phone: +61-3-9558-8177
Fax: +61-3-9558-8255

• Taiwan

Anritsu Company Inc.

7F, No. 316, Sec. 1, NeiHu Rd., Taipei 114, Taiwan
Phone: +886-2-8751-1816
Fax: +886-2-8751-1817