ADSL Modem User's Manual

RECSPEED-8000E

ATM-based ADSL Broadband Access System

- Contents -

1. FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measure:

- Reorient or relocated the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is
   connected.
- Consult the dealer or an experienced radio/TV technician for help.
- Shielded cables must be used to comply with FCC regulations.

WARNING (Part 15, Section 15.21)

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

2. Overview

Asymmetric Digital Subscriber Line (ADSL) technology is the latest line coding technology enabling subscribers to access the network at a high speed through the existing telephone lines. It provides subscribers with network access services from several tens Kbps up to several Mbps for the downstream data from the ISP to the subscriber and from several tens Kbps up to 1 Mbps for the upstream data from the subscriber to the ISP, depending on the physical length of the subscriber line and the network service contract level with the ISP.

Furthermore, along with new data transferring capabilities, subscribers are also provided with usual telephone services, as well.

ADSL allows very cost-efficient application services with asymmetric traffic characteristics such as high-speed Internet access and Video-On-Demand (VOD), by providing services where downstream data is about 10 times faster than upstream data.

RECSPEED-8000E, RECSOL I&C ADSL modem, is located in the customer premises of the ADSL-based subscriber network, and allows the subscriber to use actual ADSL services. The following section describes how to use ADSL services through RECSPEED-8000E.

For the said purpose, it is necessary to understand the entire network architecture. The entire network configuration diagram is shown in the Figure-1.
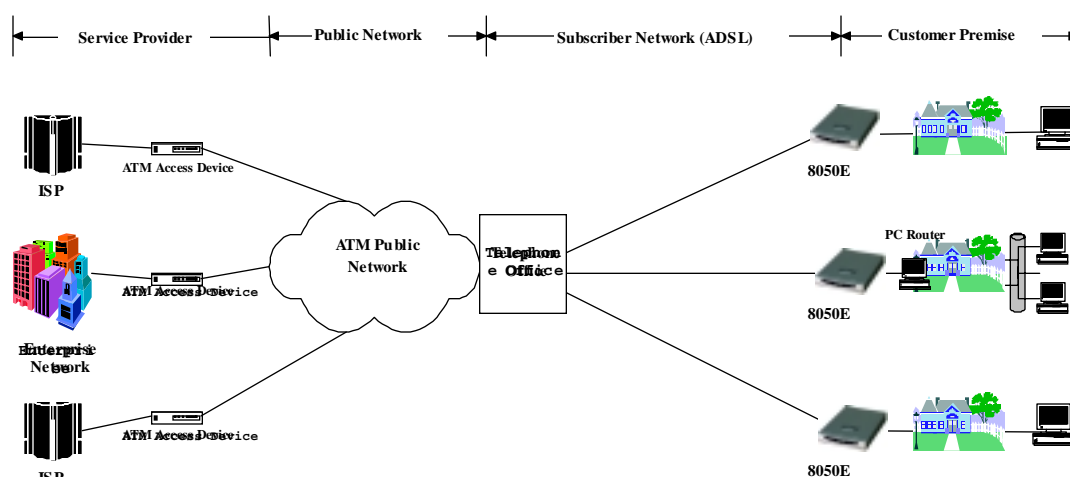
Figure-1 ADSL Service Network Configuration Diagram

As shown in Figure-1, RECSPEED-8000E is connected to the ATM backbone network adopted from B-ISDN by base transmission method through the ADSL, and to the subscriber via Ethernet. Therefore, it basically requires the function to convert between ATM traffic of the network and Ethernet traffic of the subscriber.

For the said purpose, RECSPEED-8000E is designed to support the inter working structure for end-to-end services at Layer 2, for which it executes Ethernet Bridging Function.

For a more specific description of the above, the diagram of entire network configuration in terms of end-to-end protocol structure is shown in the Figure-2.
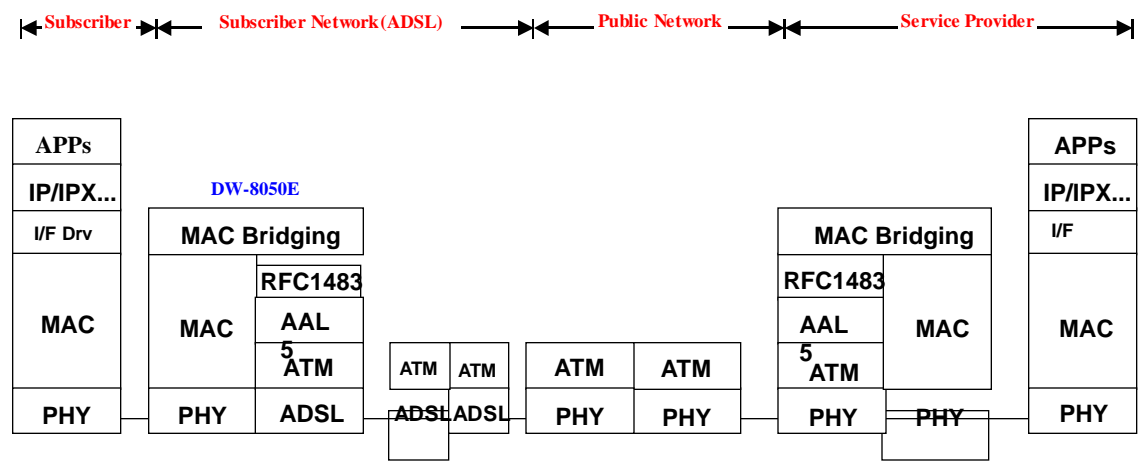
Figure-2 Protocol Inter working Structure of Entire Service Network

3. Introduction

3.1 RECSPEED-8000E overview

RECSPEED-8000E is installed and connect to the customer premises, and enables the users to access ADSL services, through a convenient menu-driven interface:

 1) Access to system status and configuration information,
 2) Online software upgrade,
 3) Access to and setting of ATM VCC status information,
 4) Access to ADSL interface status information,
 5) Access to Ethernet interface status information,
 6) Bridging function, spanning tree setup and access to status information.

RECSPEED-8000E features two methods of implementing user's interface. A user can connect a terminal directly to RS-232 serial port of RECSPEED-8000E, or use Telnet through the network interface.

Upon initial installation of RECSPEED-8000E, however, it is possible only to access the serial port, since the IP address of RECSPEED-8000E is not assigned yet.

Access to RECSPEED-8000E through the serial port is available with any standard terminal equipment at the speed of 9,600 baud rate.

3.2 Components

Unpack the package of RECSPEED-8000E and verify that the following components are included. There should be following components (Refer to Figure-3).

1) RECSPEED-8000E main body 1 set
2) Ethernet cable (cross-connect) 1 ea
3) Telephone cable 1 ea
4) DC power Adapter 1 ea
5) Cable for DC power Adapter 1 ea
6) Micro filter 2 ea
7) User's manual 1 copy

3.3 Name and functions

3.3.1 Front panel

Figure-4 shows LEDs that are equipped on the front panel of RECSPEED-8000E.
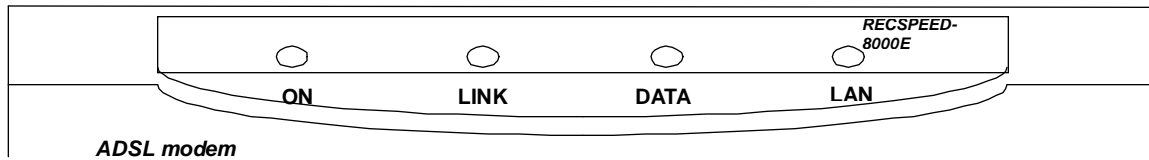
Figure-4 Front panel of RECSPEED-8000E

RECSPEED-8000E has four LEDs as shown in the figure above, which instantaneously indicate the modem status as described below:

ON (Green)	Indicates the connection to the power supply. This LED is on when power is provided.
LINK (Green)	The LED indicates that the link status of ADSL. It blinks while the link is attempted, and remains on once the link is established.
DATA (Green)	The LED indicates data is transmitted over ADSL. That is, it blinks whenever data is received or transmitted over the ADSL.
LAN (Green)	The LED indicates the connection status of Ethernet. It remains on as long as the physical connection is established normally.

3.3.2 Rear panel

The following Figure-5 shows the switch and various connectors that are equipped on the rear panel of RECSPEED-8000E.
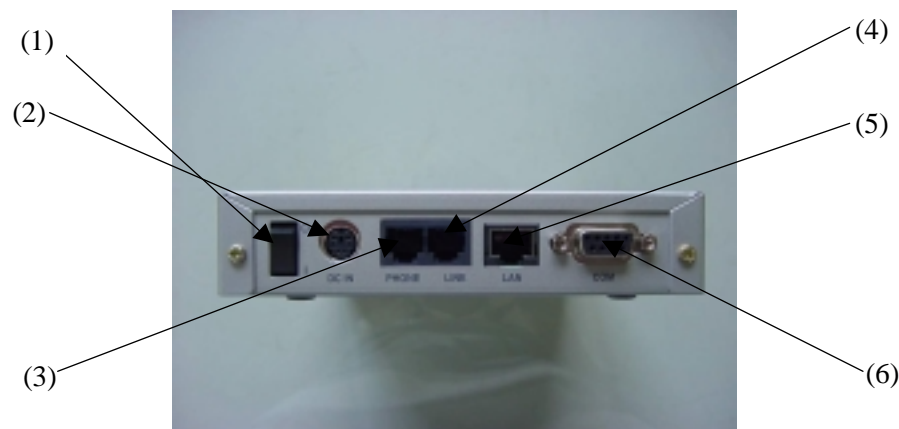
Figure-5 Rear panel of RECSPEED-8000E

(1)	Power switch	Used for supply and blocking of power.
(2)	Power Port(DC IN)	Connects the power connection cable.
(3)	Phone Port	Connects the telephone cable. (alert : In front of telephone, Micro filter must be attached).
(4)	Line Port	Connects the telephone cable in ADSL line.
(5)	LAN Port	Connects the Ethernet cable. (the cable is cross-connected)
(6)	Serial port	Connects the RS-232 serial cable.

4. Installation

4.1 Cable connection

1) Connect the power to the DC In Port for power supply in the RECSPEED-8000E main body by using the DC power adapter.
2) Connect the LAN port of RECSPEED-8000E main body to the ethernet card of PC by using the ethernet cable.
3) Connect the telephone cable between the LINE port of RECSPEED-8000E main body and the telephone connector that is installed in the house (mainly on the wall).
4) Connect the serial cable between the RS-232 serial ports of PC and RECSPEED-8000E main body.
5) Connect the telephone cable between the telephone and the micro filter.
6) Connect the RJ-11 connector, which is attached to the micro filter that is connected with the telephone, to the PHONE port of RECSPEED-8000E main body.

On the above, 5) and 6) are applied in case of telephone connection. (Refer to Figure-6)

Figure-6 Cabling

4.2 Installation and operation preference

If the cable installation is completed, supply the power for the PC and RECSPEED-8000E. If the terminal emulation program such as hyper-terminal is executed, the prompt that requests the password input is displayed on the screen.

When the RECSPEED-8000E is produced, the password is set up as "8000E" for delivery. Therefore, if this password is entered, RECSPEED-8000E can be logged on. This password should be changed for the future system security. If you forgot the password, you should receive the technical support of the company.

If the log on is successful, the main menu is displayed on the screen. After this, set up ATM PVC by using the functions provided from the main menu and then, if necessary, set up the IP address of RECSPEED-8000E, the subnet mask, and the IP address of basic gateway.

For the details about how to set up, refer to the descriptions for menus by each level that are provided with the user interface by each function.

4.3 PC specifications required

      - 10 Base-T ethernet card
      - Microsoft Windows 95/98/NT
       * PC configuration : Pentium MMX-300MHz, Memory 64MB

4.4 Modem system default values(factory settings)

IP Address Information		ATM PVC Information		Password
IP address	10.0.0.1	Vpi	0	
Subnet Mask	255.0.0.0	Vci	33	8000E
Gateway	10.0.0.1	pcr	disable	

5. Modem operator menu

Precautions

This chapter describes the modem operator menu that is used by the ADSL service provider. The general subscribers had better not use this menu without the consent with the ADSL service provider.

If the installation process described in the chapter 3 is completed and the power is supplied for RECSPEED-8000E, the default booting screen of RECSPEED-8000E is displayed on the screen of standard terminal connected with the serial cable. After that, in order to verify, the legal operator for system, the screen for password input is displayed.

If the password is entered correctly in this status, the following default menu is displayed on the screen. If the user presses the input character (English character surrounded with "[" and "]") that indicates the menu to provide the desired function, she/he can move to the related sub-menu.

```
                    RECSPEED-8000E - Main Menu


                  [S] System
                  [B] Bridge
                  [E] Ethernet interface
                  [A] Atm interface
                  [D] Dsl interface
                  [X] eXit
                  Enter Selection:
```

5.1 Main Menu – System Menu

This menu is used to display general information about RECSPEED-8000E system and to change settings. It is displayed on the screen in the following format:

```
RECSPEED-8000E - Main Menu - System

Firmware Version          8000E-XXXX
System Uptime             0000:00:10:12:40
Name of System            RECSPEED-8000E
Contact Name              DAYTEK Electronics
Location                  Vancouverl
Ethernet Address          00:00:3B:10:24:3B
IP Address                10.0.0.1
Subnet Mask               255.0.0.0
Default Gateway           10.0.0.1


[P]    Password change
[F]    Firmware upgrade
[S]    Setting values
[R]    Reset system
[I]    rs-232 Interface
[X]    eXit


Enter Selection:
```

5.1.1 Main Menu – System – Password Change

This menu is used to change the current password. The following screen is displayed. As mentioned above, the factory preset password is "8000E" (in lowercase).

```
RECSPEED-8000E - Main Menu – System – Password Change

Enter New Password (up to 8 characters):  ********
Re-Enter New Password: ********


Recording Changes. This may take a while … Done
```

After the password is changed, the screen is returned to the previous menu.

5.1.2 Main Menu – System – Firmware Upgrade

This menu is used to upgrade or change the firmware currently installed and operating in RECSPEED-8000E. For this purpose, firmware upgrade is supported by TFTP on your network.

The following screen is displayed:

```
RECSPEED-8000E - Main Menu – System – Firmware Upgrade

[T]        Tftp – via network
```

```
                              [X]        Exit

                                Enter Selection: T
```

This option appears when 'T' shortcut key is entered. When TFTP is used, the following screen is displayed first to prompt the user to enter IP address of the TFTP server and the file name. If input parameter is not valid, the screen switches back to the previous menu.

```
Do you upgrade the firmware ? (Y)es or (N)o : YES
Enter TFTP Server"s IP Address (eg., 192.100.100.1) : 10.0.0.1
Enter Filename : hasbv1.bin

Please wait for preparing download...OK!
Ip address: a67d14b0
Filename: hasbv1.bin
TFTP Init OK in BINARY Form.
TFTP Open OK in BINARY Form.
Starting TFTP download in BIN Form...
.......................
TFTP Close OK in BINARY Form
TFTP download completed: 0xc1e8c bytes

Do you proceed ? (Y/default No)y

current sector #3: remained bytes: 728716
current sector #4: remained bytes: 663180
current sector #5: remained bytes: 597644
current sector #6: remained bytes: 532108
current sector #7: remained bytes: 466572
current sector #8: remained bytes: 401036
current sector #9: remained bytes: 335500
current sector #10: remained bytes: 269964
current sector #11: remained bytes: 204428
current sector #12: remained bytes: 138892
current sector #13: remained bytes: 73356
current sector #14: remained bytes: 7820
current sector #15: remained bytes: 0
Application firmware is upgraded successfully
Upgrade successfully
```

5.1.3 Main Menu – System – Setting Values

With this menu option you can change some system configuration information for ease of working.

The following screen is displayed.

```
              RECSPEED-8000E - Main Menu – System – Setting Values
```

```
                              [N]      Name of system
                              [C]      Contact name
                              [L]      Location
                              [I]      IP Address
                              [D]      set configuration info.as Default
                              [X]      eXit


                              Enter Selection:
```

Name of System is factory preset to RECSPEED-8000E, but user can change it later for choice. Up to 20 characters are provided for this field.

Contact Name includes such information as the store where you bought this product and the like. Up to 20 characters are provided for this field

Location refers to the place where the system is installed. Up to 20 characters are provided for this field.

If *IP Address* is modified, you must also change the Subnet Mask and the Default Gateway.

Default value is following.(Factory preset)
IP Address : 10.0.0.1
Subnet Mask : 255.0.0.0
Gateway : 10.0.0.1

If menu[D](set configuration info as. Default) is selected, modem software configuration value.

5.1.4 Main Menu – System – Reset System

This menu option is used to reset the system through user interface, without manipulating the power switch.

5.1.5 Main Menu – System – RS-232 Interface

This menu displays information about RS-232 serial port. The following screen is displayed:

```
         RECSPEED-8000E - Main Menu – System – rs232 Interface


         ====================================
            Baud Rate                9600
            Data Bits                8 bit(s)
            Stop Bits                1 bit(s)
            Parity                   None
         ====================================
                   Press any key to continue…
```

5.2 Main Menu – Bridge

This menu option provides access to the status information and setting configuration for bridging

function of RECSPEED-8000E. The following screen is displayed:

```
                    RECSPEED-8000E - Main Menu - Bridge

               [S]   Static entry list
               [D]   Dynamic entry list
               [R]   Remove all dynamic entry
               [X]   eXit

               Enter Selection:
```

5.2.1 Main Menu – Bridge – Static Entry List

This menu displays registered static entries. Enter a specific port number to display. The following screen is displayed:

```
              RECSPEED-8000E - Main Menu – Bridge – Static Entry  List

                    The Total number of dynamic entry:  3
         ==========================================================
            in-port            dest. MAC address      out-port (bit-mapped)
            ---------------------------------------------------------
             1                 ff-ff-ff-ff-ff-ff                   11111111
             1                 01-80-c2-00-00-00         11111110
             0                 00-00-3B-10-20-34              00000000
         ==========================================================

                        Press any key to continue…
```

5.2.2 Main Menu – Bridge – Delete Static Entry List

This menu option is used to delete Ethernet address that has been registered by the user for filtering table to execute bridging function of RECSPEED-8000E. The following screen is displayed:

```
              RECSPEED-8000E - Main Menu - Bridge – Dynamic Entry List

                    The Total number of dynamic entry:  3
                    ============================
                    Port          MAC address
                    ----------------------------
                     1            00-40-44-10-20-32
                     1            00-40-44-10-20-33
                     1            00-40-44-10-20-34
```

```
            ============================

                 Press any key to continue…
```

5.2.3 Main Menu – Bridge – Static Entry List

This menu displays information about Ethernet interface.

5.3 Main Menu – Ethernet Interface

This menu option displays information about Ethernet interface.

```
        RECSPEED-8000E - Main Menu – Ethernet Interface


                 [S] Show Statistics
                 [R]Reset Statistics
                 [X]eXit

             Enter Selection:
```

5.3.1 Main Menu – Ethernet – Show Statistics

This menu shows the statistics information received/transmitted via Ethernet interface.

```
    ===========================================================
            Receive Statistics          Transmit Statistics
    -----------------------------------------------------------
        Total Octets   2934524      Total Octets        123456
    Unicast Frames   231       Unicast Frames          234
    Non-unicast Frames   231        Non-unicast Frames       0
    Discards          0            Discards             0
    Errors               0         Errors               0
    Unknown Protocol      0
    ===========================================================
    Press any key to continue...
```

5.3.2 Main Menu – Ethernet – Reset Statistics

Initialize all statistic values related to the Ethernet interface, which is counted currently, as 0.

5.4 Main Menu – ATM Interface

This menu option allows setting ATM PVC and displaying several status information related to the ATM interface. The following screen is displayed:

```
RECSPEED-8000E - Main Menu – ATM Interface

    [S]     Show connection
    [C]     Create atm pvc
    [D]     Delete atm pvc
    [L]     aaL5 statistics
    [A]     Atm statistics
    [R]     Reset all statistics
    [X]     eXit

    Enter Selection:
```

5.4.1 Main Menu – ATM Interface – Show Connections

This menu option displays the status of ATM PVCs that can be configured for RECSPEED-8000E. The following screen is displayed:
(default value : port 2 vpi:0, vci:33, pcr: 1000)

```
RECSPEED-8000E - Main Menu – ATM Interface – Show Connections
    ==================================================
      Port  VPI  VCI  Type   AAL/            PCR
      No                     Encapsulation   (kbps)
    ------------------------------------------------------------------------
       2    -    -    -      -              -
       3    -    -    -      -              -
       4    0    32   PVC    AAL5/SNAP      600
       5    1    98   PVC    AAL5/SNAP      400

    Press any key to continue…
```

At this time, each port number displayed operates as the logical bridge port. Therefore, if four ATM VCCs of which the setup is available are set up all, RECSPEED-8000Eoperates as the multi-bridge that has five ports (including one Ethernet port).

5.4.2 Main Menu – ATM Interface – Create ATM PVC

This menu is used to set the ATM PVC. Up to four ATM PVCs can be set. One ATM PVC operates as one bridge port. At this time, such parameters as the port number of the corresponding PVC, VPI/VCI value and PCR value must be specified.

Values available for these parameters: 2 – 5 for port number, 0 – 255 for VPI value, 0 – 65535 for VCI value, and 0 – 1000 for PCR value.

However, if the VPI value is set as 0, the VCI value is 32-65535. This is because VPI of 0/0- 0/31 and VCI values are defined in advance by the related standards for the special use.
In addition, the PCR value should not exceed 1000 by summing up the PCR values that are set in up to four set ATM VCCs. For example, if the PCR values of port number 2, 3, and 4 are 200, 300, and 300 respectively, the PCR value of port number 5 available for the ATM VCC setup should not exceed 200.

The following screen is displayed.

```
RECSPEED-8000E - Main Menu – ATM Interface – Create ATM PVC


        Input Port No (2 – 5) : 3
        Input VPI Value (0 – 255) : 0
        Input VCI Value (0 – 65535) : 32
        Input PCR (0 – 1000 Kbps) : 640


           Recording Changes. This may take a while … Done
```

After setting the ATM VCC as shown above, verify the setup status by using the "Show connection" menu, and the setup result is displayed.

5.4.3 Main Menu – ATM Interface – Delete ATM PVC

This menu option is used to delete ATM PVCs. You must specify the number of port associated with ATM PVC to be deleted.
If you do not know the port number to be deleted, first display the current PVC setup status and then, enter the port number.

The port number ranges from 2 to 5.

The following example shows that the ATM VCC assigned for port number 2 is deleted.

```
RECSPEED-8000E - Main Menu – ATM Interface – Delete ATM PVC


              Input Port No (2 – 5) : 2

          Recording Changes. This may take a while … Done
```

After deleting the ATM VCC already set as shown above, verify the deleting status by using the "Show connection" menu.

5.4.4 Main Menu – ATM Interface – AAL5 Statistics

This menu option displays the status information related to AAL5.
The following example shows the statistics information on the port number 2.
There is no meaning for the output of status information on the port that is not set currently.
Therefore, the input for requesting the information on unset port is processed as the input error.

```
            Input Port No (2 – 5) : 2

RECSPEED-8000E - Main Menu – ATM Interface – AAL5 Statistics
================================================
Receive Statistics        Transmit Statistics

--------------------------------------------------------------------------------
Total Frames          0      Total Frames                  0
Total Octets       0      Total Octets              0
User Cells            0      Total Cells                   0
OAM Cells             0      OAM Cells                     0
Bad OAM Cells         0      EFCI=1 Cells                  0
RM Cells              0      CLPI=1 Cells                  0
Bad RM Cells          0      Queue Overflow                0
EFCI=1 Cells          0      Out of Cells          0
CLPI=1 Cells          0      Inactive                      0
Discarded Cells       0      Loopback Requests             0
Discarded Frames  0      Loopback Responses        0
Inactive              0      Loopback Reqs OK              0
CRC Errors        0      Loopback Reqs Fail        0
Reassembly Timeout    0
Too Long Frames  0
OAM AIS Cells         0
OAM RDI Cells         0
OAM CC Cells          0
Loopback Requests     0
Loopback Responses    0
============================================================

Press any key to continue...
```

5.4.5 Main Menu – ATM Interface – ATM Statistics

This menu option displays the status or statistics information related to ATM layer.
The AAL5 statistics information shows only the statistics value on one ATM VCC that is assigned for the specific port.
However, this menu shows the statistic values related to ATM layer in all ports.

```
RECSPEED-8000E - Main Menu – ATM Interface – ATM Statistics
```

```
===========================================================
Receive Statistics              Transmit Statistics

-----------------------------------------------------------------------------------------------
Cells                  0          Cells                   0
OAM Cells              0          OAM Cells               0
CLPI=1 Cells           0          CLPI=1 Cells            0
EFCI=1 Cells           0          EFCI=1 Cells            0
RM Cells               0          RM Cells                0
Discards               0
HEC Error Cells        0
OCDs            0
OCD time (ms)   7672000
===========================================================
Press any key to continue...
```

### 5.4.6 Main Menu – ATM Interface – Reset all Statistics

Initialize all statistic values related to all ATMs, which are counted currently, as 0.

5.5 Main Menu – DSL Interface

This menu option displays the status related to the ADSL interface of RECSPEED-8000E.

After the power is supplied for RECSPEED-8000E and required software is loaded, the ADSL link is automatically set after about 20 seconds.

The following screen is displayed:

```
          RECSPEED-8000E - Main Menu – DSL Interface

                [M]   Mode (Full/G.Lite)
                [L] Link status
                [I]  link Initialization
                [X]eXit


             Enter Selection:
```

5.5.1 Main Menu – DSL Interface – Mode (Full/G.Lite)

This menu is for the current setup status output and change on the ADSL line mode with which RECSPEED-8000E attempts the link setup. This mode is divided into "G. Lite" and "Full Rate" types. The value for delivery is set as "G.Lite".
This mode should be changed according to the subscription conditions with the provider that currently provides the user with ADSL service.

The following screen is displayed.

```
                        --- Adsl Mode
```

```
                      * Current Mode : G.Lite
                       * Select (F)ull or (G).lite : Full

                Recording Changes. This may take a while … Done
```

The example above shows that the current setup mode is "G. Lite" and that to change the mode into "Full Rate", "F" is entered. Since this setup mode is stored even though the system power is blocked, it is not necessary to reset the mode after setting it once.

5.5.2 Main Menu – DSL Interface – Link Status

This menu option displays information about the current ADSL link status.

Through this menu, the user can know the upstream and downstream physical line speed that is currently set between the ADSL service provider and user. This speed is also designated according to the agreement with the subscribed ADSL service provider.

The following example shows the status after the link setup is finished.

```
            RECSPEED-8000E - Main Menu – DSL Interface – Link Status

--- ADSL Line Status
Status              : OPERATIONAL (1)
SnrMgn(dB)          : 12
Attenuation         : 14
PSDM(-dBM)          : 38
ALARMS              : No Defect
ADSL Framing Mode   :3
Ds TxRate(kbps)   : 8160              US TxRate(kbps) : 864
CrcBlookLength   : 136        CroBlockLength: 174
Symbol/Codeword      :1                Symbol/Codeword: 1
CheckBytes           :8                ChckBytes    : 8
Intl Delay(ms)  : 0                   Intl Delay(ms): 0
Es Count      : 0
ReceivedBlks   : 30498
TransmittedBlks: 30498
CorrectedBlks  : 0
UncorrectedBlks: 0


Press any key to continue...
```

5.5.3 Main Menu – DSL Interface – Link Initialization

This menu is used to set new ADSL link with new conditions. After changing the ADSL line mode of RECSPEED-8000E, execute this menu. Then, the line setup can be easily executed without the initialization operation of system.

6. RECSPEED-8000E specifications and characteristics

Physical layer	DMT, T1413 Issue 2 compliant ITU-T 992.1, ITU-T 992.2 Analog Device AD20msp930 DMT, T1.413 Issue 2 compliant Supports both UADSL and Full rate ADSL G.Lite Software Upgradeable
Size	140mm x 210mm x 32mm (W x D x H)
Weight	760g
Consumption power	AC110 - 220 VAC/50-60MHz
Temperature	$0\,^{o}C$ - $40^{o}C$
Humidity	10 % - 90 % non-condensing
Connector	ADSL: RJ-11 Ethernet: RJ-45 Crossover Serial: RS232 DB9
Specification and authentication	Type Approval of telecom.