

Ethernet Link-layer OAM Loopback

How to configure OAM loopback on Anritsu Network Master Pro/Flex with third-party network device

Network Master Pro MT1000A / Network Master Flex MT1100A

Link-layer OAM (802.3ah) is an OAM protocol operating purely at the Ethernet layer without the requirement for setting IP addresses. 802.3ah operates only on point-to-point links and messages are sent in untagged slow protocol frames called OAM Protocol Data Units (OAMPDUs). OAMPDUs are multicast to a specific multicast address that is link-constrained, meaning OAMPDUs only traverse a single link, and are never forwarded by bridges or switches, even if these do not implement OAM.

The capabilities of the link-layer OAM protocol itself are limited to placing the remote device into loopback mode, setting flags indicating critical events, and querying the configuration of the remote device.

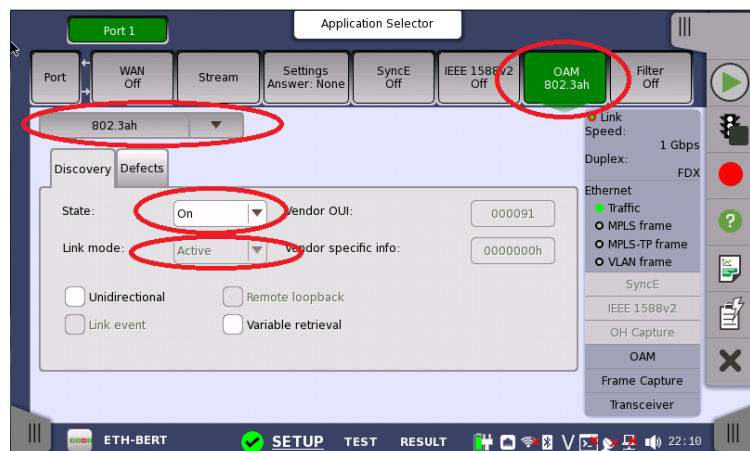
Two modes are defined for OAM entities: active or passive. The active-mode device can control the passive-mode device. For example, the active-mode device can send commands (Loopback Control OAMPDU) forcing the passive-mode device into or out of loopback mode.

This note describes how to configure the Network Master Pro/Flex to act as an active OAM device capable of remotely setting a connected passive-mode OAM device into loopback mode. Configuration of the third-party Accedian NID network device is described as well.

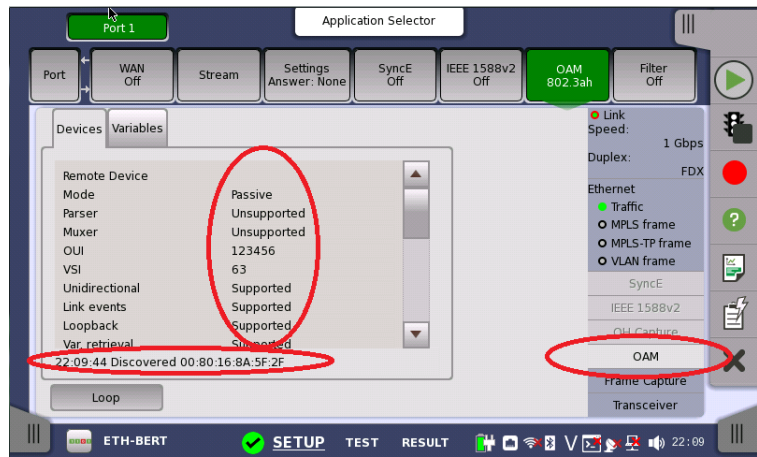
Network Master Pro/Flex OAM Setup

Follow the below steps to enable the remote OAM loopback function in the Network Master Pro/Flex.

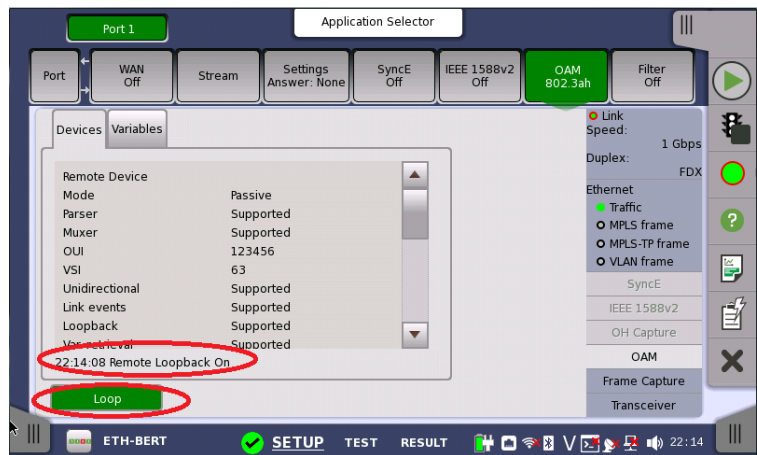
1. At the **SETUP** page, go to the **OAM 803.3ah** tab and select the **802.3ah** function. At the **Discovery** tab set **State** to **On** and set **Link mode** to **Active**.



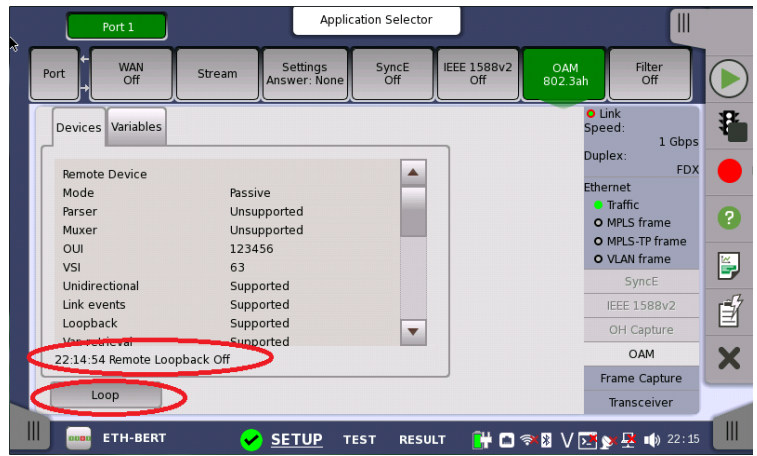
2. Go to the **OAM** status page and verify the **Remote Device** is discovered correctly. The Network Master is now ready to start remote loopback.



3. Press the **Loop** button to start OAM remote loopback. The status window shows the result of the remote loop-up request.



4. Press the **Loop** button again to take the remote device out of loopback mode. The status window shows the result of the remote loop-down request.

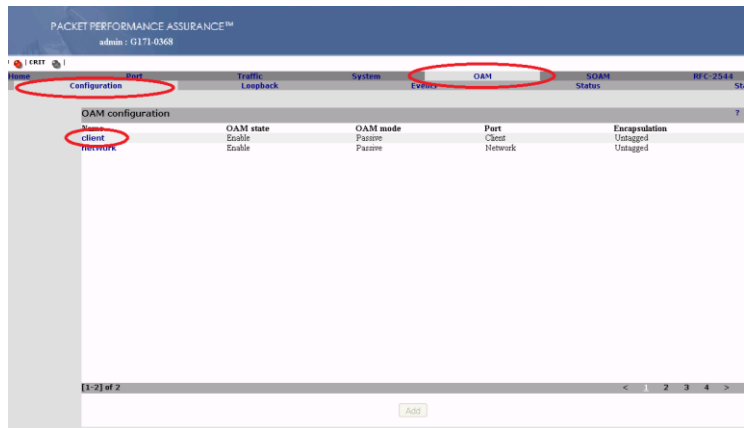


Accedian NID - OAM Remote Loopback

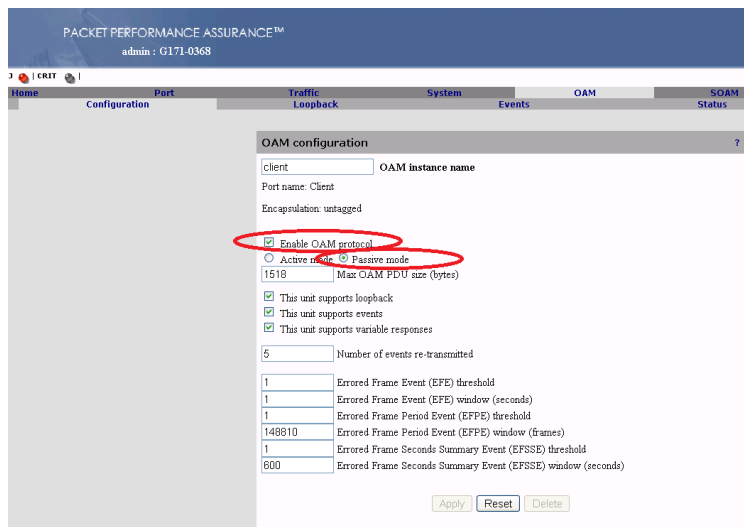
Follow the steps below to enable the remote OAM loopback function in Accedian NIDs¹.

1. Select the **OAM -> Configuration** page, and select the OAM instance for the port at which to configure the loopback function.

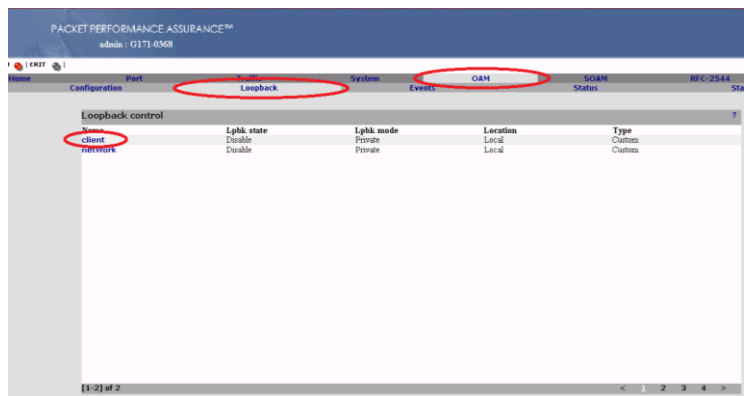
In this example, this is the **client** port.



2. Make sure the **Enable OAM protocol** checkbox is checked and select **Passive mode**.

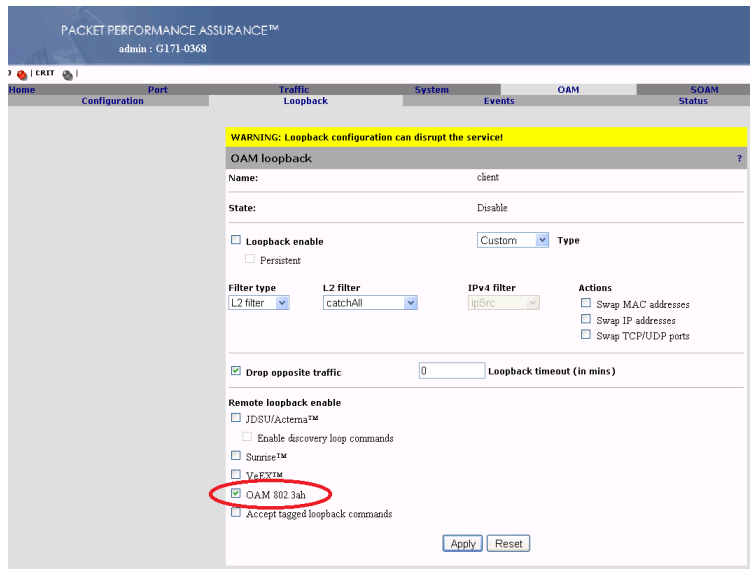


3. Select the **OAM -> Loopback** page, and select the OAM instance at which to configure the loopback function. In this example, this is the **client** instance (port).

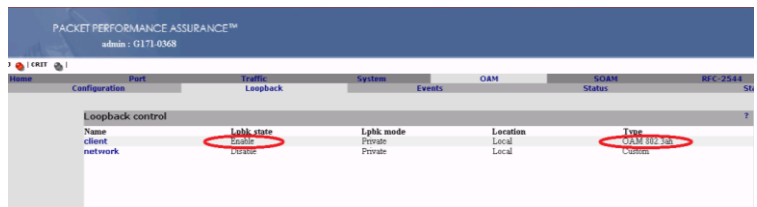


¹ The configuration examples in this document are made via the web interface of the ACCEDIAN NETWORKS EtherNID AEN-1000-GE, running firmware version 4.9.2.1. Similar functions may be found in other NIDs from ACCEDIAN NETWORKS, but with slightly different configuration menus.

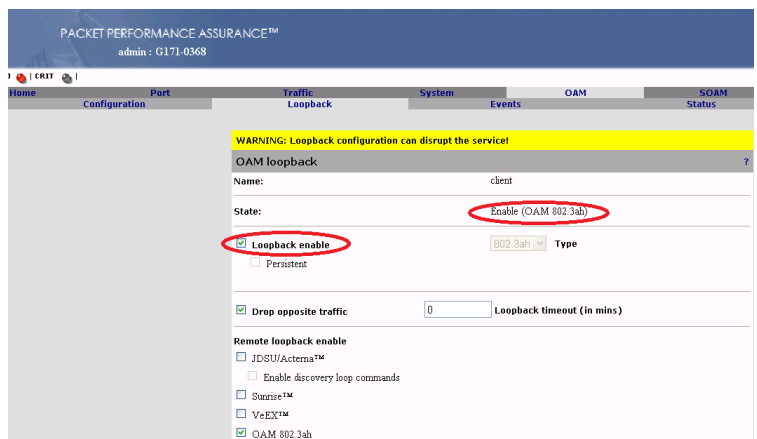
4. Make sure the **Remote loopback enable OAM 802.3ah** checkbox is checked.
 The Accedian NID is now ready to accept remote loopback requests from the Network Master.



5. After receiving and accepting the command to set the interface to loopback mode, the loopback status is reflected at the **OAM -> Loopback** screen...



...and the **client** instance detailed page.



Accedian NID - Loopback using Custom Filters

As described earlier, 802.3ah OAM operates only on point-to-point links. When test equipment and the Accedian NID are at different test points in a routed network, it is impossible to remotely start the loopback function from the Network Master Pro/Flex. However, using the Accedian NID filters and the built-in Custom Loopback function, it is possible to configure the Accedian NID to loopback test traffic originating from Network Master Pro/Flex while passing other traffic streams.

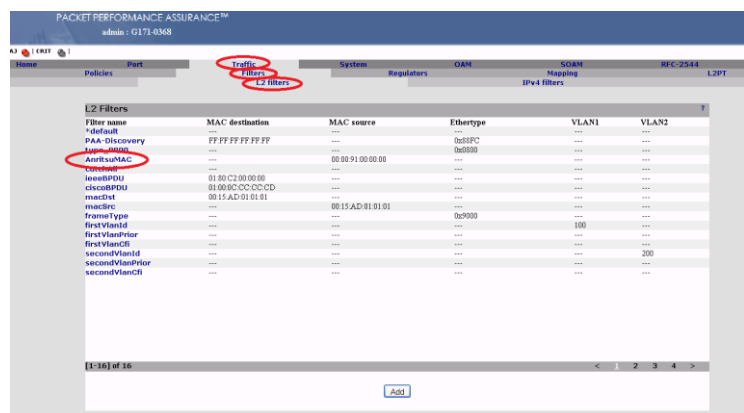
Follow the steps below to configure the Accedian NID Custom Loopback function. The first step is to configure a filter to address traffic to loopback. The second step is to configure the loopback function to use this filter.

The following example describes how to configure a filter to loopback streams originating from any Anritsu test set (the MAC address of an Anritsu source). In this example, only Layer 2 is filtered. Depending on the network configuration, more advanced filters are available for specifying VLAN/IPV4/UDP/TCP properties of the looped-back traffic.

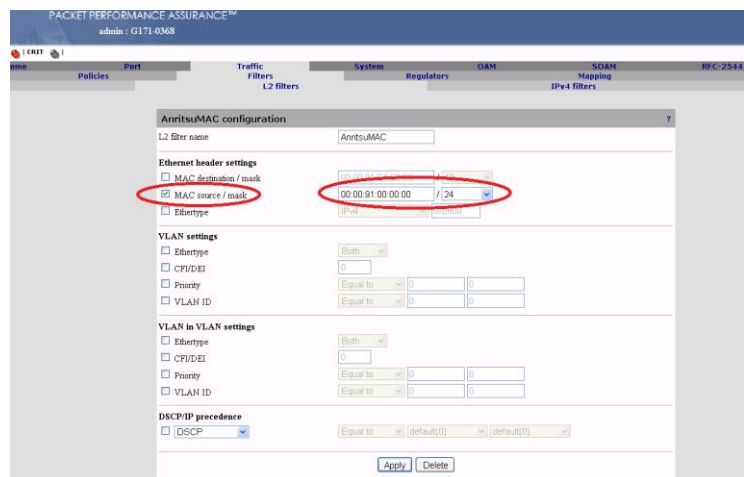
1. We want to set a filter to address all traffic originating from an Anritsu test set, i.e. with an Anritsu source MAC address of 00:00:91:xx:xx:xx (Anritsu Corporation registered and default instrument addresses).

Select the **Traffic -> Filters -> L2 filters** page, and select the filter instance to configure.

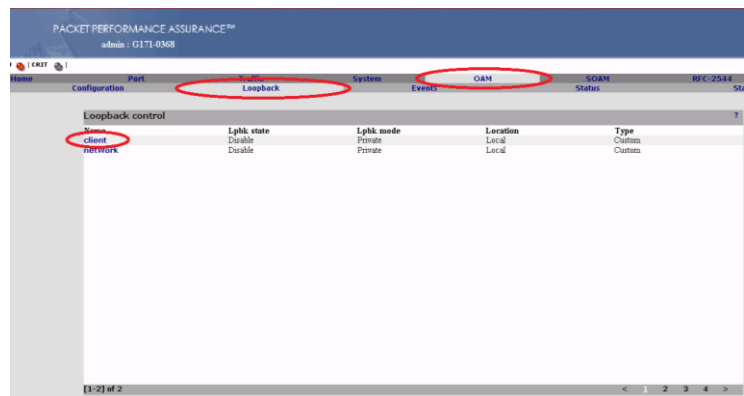
In this example we are setting up the **AnritsuMac** filter.



2. Enable **MAC source/mask** and set a source MAC address of 00:00:91:xx:xx:xx. Set 24 bit mask to look only at the first 3 bytes and ignore the last 3 bytes.



3. Select the **OAM -> Loopback** page, and select the port at which the loopback function is to be configured. In this example, the **client** instance (port) is set.

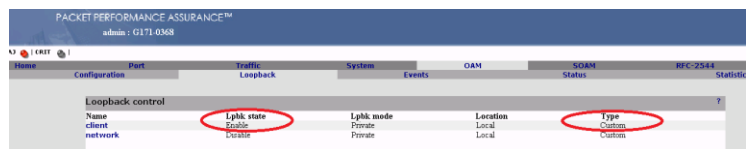
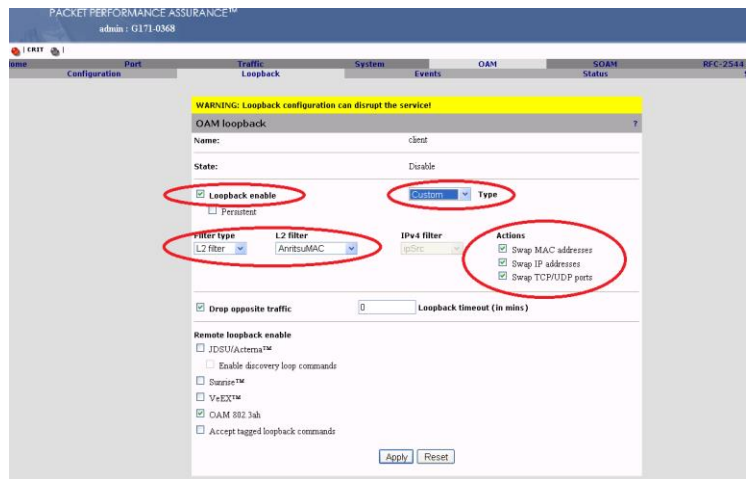


4. Put a checkmark in the **Loopback enable** checkbox and select **Custom** at **Type**. Select **L2 filter** at **Filter type** and select **AnritsuMAC** from the list of available L2 filters.

If applicable, also enable swapping of MAC/IP addresses, and TCP/UDP ports.

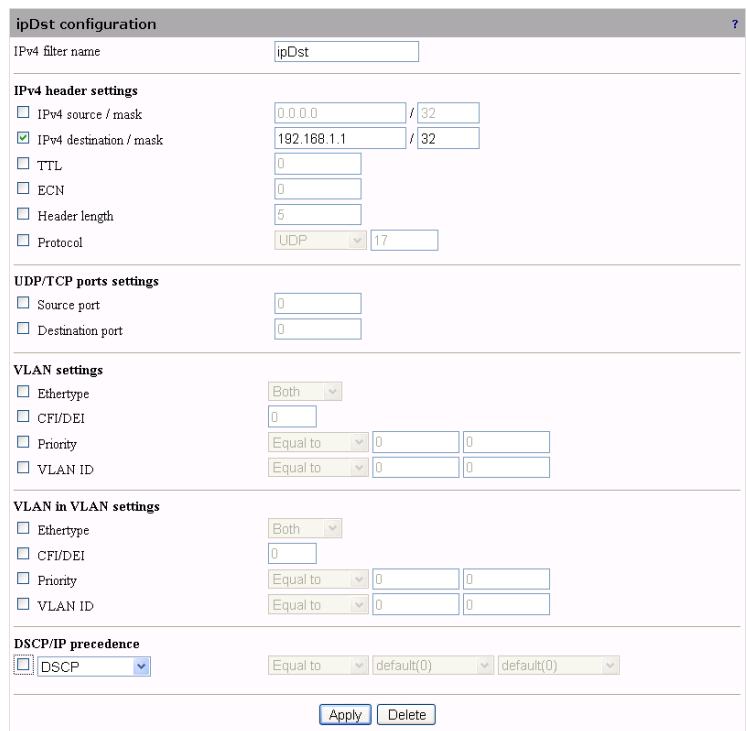
The Client port of the Accedian NID will now loopback all traffic originating from an Anritsu test set with source MAC address of 00:00:91:xx:xx:xx.

5. After enabling custom loopback, the loopback status is reflected at the **OAM -> Loopback** screen.



Note:

As mentioned previously, many more filter properties can be used to uniquely identify the traffic to loop-back. This is the configuration page for an IPv4-type filter which, in addition to VLAN parameters, includes parameters for IPv4 source and destination addresses, DSCP/IP precedence and other IP header fields, UDP/TCP source and destination ports.



Conclusion

Controlling and creating a loopback via OAM 802.3ah across a non-rerouted network or implementing custom filters on devices such as the Accedian NID simplifies testing for telecom engineers. Combining these functions with the flexibility and powerful Ethernet testing capabilities of the Network Master Pro/Flex, allows engineers to troubleshoot any issues quickly.

• 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