MONITORING AND DEBUGGING

bintec User's Guide   Monitoring and Debugging

1 Monitoring and Debugging Menu

The fields of the *MONITORING AND DEBUGGING* menu are described below.

```
R232bw Setup Tool              Funkwerk Enterprise Communications GmbH
[MONITOR]: Monitoring and Debugging                          MyGateway


          ISDN Monitor            ATM/OAM
          ISDN Credits            ADSL
          xDSL Credits

          Interfaces
          Messages

          TCP/IP                  IP QoS
          IPSec                   SSHD



          EXIT

```

The *MONITORING AND DEBUGGING* menu contains submenus that enable you to locate problems in your network and monitor activities, e.g. at your gateway's WAN interface.

Menu	Meaning
ISDN Monitor	Logs incoming and outgoing ISDN calls.
ISDN Credits	Statistics of the ISDN subsystems ppp and isdnlogin.
xDSL Credits	Statistics of the xDSL subsystem PPPoE.
Interfaces	For monitoring the traffic of the individual interfaces.

The interface status can also be changed via this menu (*up*, *down*, *reset*). |
| Messages | Shows system messages generated by the gateway's logging and accounting mechanism. |

Menu	Meaning
TCP/IP	This menu is for monitoring the IP traffic of the individual protocols.
IPSec	This menu shows global IPSec statistics and lists the *IKE SECURITY ASSOCIATIONS* and *IPSEC SA BUNDLES* of all active IPSec tunnels.
ATM/OAM	This menu displays the current values and activities of the ATM interface.
ADSL	This menu is for monitoring an ADSL connection.
IP QoS	This menu contains QoS-specific statistics.
SSHD	In this menu you can view existing SSH connections.

Table 1-1:   Submenus in *MONITORING AND DEBUGGING* menu

2 ISDN Monitor Submenu

The *ISDN MONITOR* submenu is described below.

A list of the existing ISDN connections (incoming and outgoing calls) is displayed:

```
R232bw Setup Tool           Funkwerk Enterprise Communications GmbH
[MONITOR][ISDN CALLS]: ISDN Monitor - Calls                MyGateway

Dir   Remote Name/Number   charge Duration  Stack  Channel    State

out   isdnlogind/1111          101       0     B1      active
in    isdnlogind/9999           65       0     B2      active




EXIT

 (c)alls       (h)istory      (d)etails      (s)tatistics      (r)elease
```

Select c if you have used other options and wish to return to the list of existing ISDN calls.

This menu also offers you other options:

■   Select h to show a list of the last 20 ISDN calls (incoming and outgoing) completed since the last system start.

```
R232bw Setup Tool            Funkwerk Enterprise Communications GmbH
[MONITOR][ISDN HISTORY]: ISDN Monitor - History            MyGateway

  Dir Remote Number  Charge Starttime Duration Cause

  in  isdnlogind/111  06:50:11 41     (0x90) normal call clearing    =
  out isdnlogin/112   06:50:57 4      (0x90) normal call clearing    |
  in  isdnlogind/113  06:52:04 110    (0x90) normal call clearing    |
  in  isdnlogind/114  06:56:05 4      (0x90) normal call clearing    |
  in  isdnlogind/115  06:56:11 0      (0x90) normal call clearing    |
  in  isdnlogind/115  06:56:17 1      (0x90) normal call clearing    |
  in  isdnlogind/115  06:56:23 1      (0x90) normal call clearing    |
  in  isdnlogind/114  06:56:28 2      (0x90) normal call clearing    |
  in  isdnlogind/114  06:56:32 1      (0x90) normal call clearing    |
  in  isdnlogind/112  06:56:37 2      (0x90) normal call clearing    |
  in  isdnlogind/111  06:56:51 4      (0x90) normal call clearing    |
  in  isdnlogind/113  06:57:00 2      (0x90) normal call clearing    |
  in  isdnlogind/111  06:57:06 1      (0x90) normal call clearing    v

  EXIT

(c)alls      (h)istory     (d)etails     (s)tatistics     (r)elease
```

■ Place the cursor on an existing or completed ISDN call and select d to display detailed information about this call.

```
R232bw Setup Tool            Funkwerk Enterprise Communications GmbH
[MONITOR][ISDN DETAILS]: ISDN Monitor - Details            MyGateway

Remote Number: 111                    Direction: in    State:

  Cause         (0x90) normal call clearing
  Local Cause   (0xb) chan busy
  Info          isdnlogind

  Local Number  999
  Dispatch Item ISDN Login

  Stack         0
  Channel       B2
  Charging Info

  SIN           telephony


  EXIT

(c)alls      (h)istory     (d)etails     (s)tatistics     (r)elease
```

■ Select s to display statistics on the activity of the existing incoming and outgoing ISDN calls.

```
R232bw Setup Tool            Funkwerk Enterprise Communications GmbH
[MONITOR][ISDN STATS]: ISDN Monitor - Statistics           MyGateway

Remote Number: 999                    Direction: out    State: active

Duration   25

    Send:                           Receive:

    Packets    107                  Packets    107
    Bytes      567                  Bytes      5478
    Errors     0                    Errors     0

    Packets/s  1                    Packets/s  1
    Bytes/s    5                    Bytes/s    218

    Load (%)   0                    Load (%)   2


  EXIT

(c)alls      (h)istory      (d)etails     (s)tatistics      (r)elease
```

■   Select r to clear the tagged existing ISDN call.

The display for the c, h and s options is updated at 1-second intervals.

3　ISDN Credits Submenu

The *ISDN CREDITS* submenu is described below.

The *MONITORING AND DEBUGGING* ➜ *ISDN CREDITS* menu shows the subsystem *PPP* and subsystem *ISDNLOGIN* and the respective *SURVEILLANCE* status.

Select a subsystem and confirm with **Return**.

The current status of the Credits Based Accounting System for the selected subsystem is displayed:

```
R232bw Setup Tool            Funkwerk Enterprise Communications GmbH
[MONITOR][ISDN CREDITS][STAT]: Monitor ppp Credits          MyGateway

                                      Total    Maximum    % reached
Time till end of measure interval (sec) 82000    86400      5

Number of Incoming Connections          1
Number of Outgoing Connections          10       100        10

Time of Incoming Connections            720      28800      3
Time of Outgoing Connections            1360     28800      5

Charge                                  0

Number of Current Incoming Connections  0
Number of Current Outgoing Connections  0
Number of Current Connections           0


EXIT
```

The display is updated automatically every two seconds.

The menu consists of the following fields:

Field	Description
Time till end of measure interval (sec)	Time in seconds until the end of the measuring interval.
Number of Incoming Connections	The number of incoming connections until now during *MEASURE TIME (SEC)* (see menu *CREDITS* ➜ *ISDN CREDITS*).

Field	Description
Number of Outgoing Connections	The number of outgoing connections until now during *MEASURE TIME (SEC)*.
Time of Incoming Connections	Total time in seconds for incoming connections until now during *MEASURE TIME (SEC)*.
Time of Outgoing Connections	Total time in seconds for outgoing connections until now during *MEASURE TIME (SEC)*. *(SEC)*.
Charge	Current charges until now (amount, units) during *MEASURE TIME (SEC)*.
Number of Current Incoming Connections	The number of current incoming connections.
Number of Current Outgoing Connections	The number of current outgoing connections.
Number of Current Connections	The total number of all current connections.

Table 3-1: Fields in the *MONITORING AND DEBUGGING* ➜ *ISDN CREDITS* ➜ *PPP/ISDNLOGIN* ➜ *EDIT* menu

Hinweis
Please note that this menu is only a display of the configured values and values achieved.

Use the *CREDITS* ➜ *ISDN CREDITS* menu to configure the limits.

4 xDSL Credits Submenu

The *xDSL CREDITS* submenu is described below.

The *MONITORING AND DEBUGGING* ➔ *xDSL CREDITS* menu provides access to the *PPPoE CREDITS* submenu.

The current status of the Credits Based Accounting System for the PPPoE subsystem is displayed:

```
R232bw Setup Tool            Funkwerk Enterprise Communications GmbH
[MONITOR][XDSL CREDITS]: Monitor PPPoE Credits             MyGateway

                                       Total    Maximum  % reached
Time till end of measure interval (sec) 82000    86400     5


Number of Outgoing Connections          10       1000      1

Time of Outgoing Connections            7260     28800     26




EXIT

```

The menu consists of the following fields:

Field	Description
Time till end of measure interval (sec)	Time in seconds until the end of the measuring interval.
Number of Outgoing Connections	Current number of outgoing connections until now during *MEASURE TIME (SEC)* (see *CREDITS* ➔ *xDSL CREDITS* ➔ *PPPoE CREDITS*).
Time of Outgoing Connections	Current total time in seconds for outgoing connections until now during *MEASURE TIME (SEC)*.

Table 4-1: Fields in the *MONITORING AND DEBUGGING* ➔ *xDSL CREDITS* ➔ *PPPoE CREDITS* menu

Hinweis

Please note that this menu is only a display of the configured values and values achieved.

Use the *CREDITS* ➜ *xDSL CREDITS* ➜ *PPPoE CREDITS* menu to configure the limits.

5   Interfaces Submenu

The *INTERFACES* submenu is described below.

The *MONITORING AND DEBUGGING* ➜ *INTERFACES* menu shows the current values and activities of the **R Series** gateway interfaces.

The values for two interfaces are displayed side by side:

```
R232bw Setup Tool              Funkwerk Enterprise Communications GmbH
[MONITOR][INTERFACE]: Interface Monitoring                  MyGateway

Interface Name      en0-1              PROVIDER
Operational Status  up                 up

                    total    per second  total   per second

Received Packets    785      2           199     1
Received Octets     130353   128         13429   86
Received Errors     0                    0

Transmit Packets    295      2           89      1
Transmit Octets     22358    169         7401    84
Transmit Errors     0                    0

Active Connections  N/A                  2
Duration            N/A                  734

EXIT                EXTENDED                     EXTENDED

```

The display is updated at 1-second intervals.

Select the interface to be displayed under *INTERFACE NAME*.

The menu contains the following fields:

Field	Description
Interface Name	For selecting the interface whose data are to be displayed.
Operational Status	Shows the operational status of the selected interface.
Received Packets	Shows the total number of packets received and the number per second.

Field	Description
Received Octets	Shows the total number of octets received and the number per second.
Received Errors	Shows the total number of errors received.
Transmit Packets	Shows the total number of packets sent and the number per second.
Transmit Octets	Shows the total number of octets sent and the number per second.
Transmit Errors	Shows the total number of errors sent.
Active Connections	Shows the number of currently active connections over the selected interface. ■ ISDN: Total number of active B-channels. ■ DSL: *N/A* or *1* *N/A* is only shown for IPSec and Ethernet interfaces.
Duration	Shows the total duration of the logical connections over the selected interface.

Table 5-1:   *INTERFACES* menu fields

Select **EXTENDED** to display additional information. You can then change the status of the interface under *OPERATION* (possible values: *set interface down*, *set interface up*, *reset*) and confirm your input with **START OPERATION**.

```
R232bw Setup Tool              Funkwerk Enterprise Communications GmbH
[MONITOR][INTERFACE][EXTENDED]: Extended Interface         MyGateway
                               Monitoring (en1-0)

OperSt InPkts     InOctets   OutPkts  OutOctets  ActCalls  IP-Address
up     1158       90041      851      70922      2         213.6.255.218

Calls:
Stk Ch  Dir Remote Number  Local DspItem RPckts  TPckts Charge Duration
0   B1  out 00101901929 4210  PPP  21     15              53
0   B2  out 00101901929 4210  PPP  8      3               50



IP Sessions:
Sourceaddress Dest-Address Prot SrcPrt DstPrt SrcIf DstIf InPkt OutPkt



EXIT    Operation >reset        START OPERATION

```

5 Interfaces Submenu

6 Messages Submenu

The *MESSAGES* submenu is described below.

The *MONITORING AND DEBUGGING* ➜ *MESSAGES* menu lists all the syslog messages (recorded as per the configuration in the *SYSTEM* menu) with their subsystem (*SUBJ*) and priority (*LEV*).

```
R232bw Setup Tool              Funkwerk Enterprise Communications GmbH
[MONITOR][MESSAGE]: Syslog Messages                            MyGateway

Subj  Lev Message

INET  INF NAT: denied incoming session in ifc 10001 prot 6 213.6.125.
PPP   DEB Layer 1 protocol hdlc, 64000 bit/sec
PPP   DEB ISP-ISDN: set ifSpeed, number of active connections 1/1/1
PPP   DEB ISP-ISDN: set ifSpeed, number of active connections 2/2/2
INET  INF NAT: denied incoming session on ifc 10001 prot 6 213.6.125.
INET  INF NAT: denied incoming session on ifc 10001 prot 6 213.6.125.
INET  INF refuse from if 100 prot 17 192.168.0.5:137->192.168.0.255.
INET  INF refuse from if 100 prot 17 192.168.0.37:138->192.168.0.255.
ISDN  DEB stack 0: deactivate
ISDN  ERR stack 0: MDL_ERROR I
ACCT  INF ISDN: 01.01.1970,03:26:38,03:27:23,42,334,247,11,9,,0,4711,
ACCT  INF ISDN: 01.01.1970,03:26:42,03:27:23,83,143,93,4,3,,0,4711,
ISDN  ERR stack 0: MDL_ERROR G


EXIT      RESET

```

Pressing the **RESET** button deletes all the existing entries.

Additional information for a certain message can be obtained by selecting an entry in the list and pressing **Return**.

A view opens with details of the selected list entry.

```
R232bw Setup Tool              Funkwerk Enterprise Communications GmbH
[MONITOR][MESSAGE]: Syslog Messages (full view)              MyGateway


  Subject        INET
  Level          INFO
  Timestamp      Thu Jan 15  6:18:20

  Message
    refuse from if 100 prot 17 192.168.0.8:137->192.168.0.255:137 (RI 1
    FI 1)





    EXIT

```

This shows the complete text of the syslog message (*MESSAGE*), its subsystem
(*SUBJECT*) and priority (*LEVEL*). The date and time (*TIMESTAMP*) the message was
created are also shown.

7 TCP/IP Submenu

The *TCP/IP* submenu is described below.

The *MONITORING AND DEBUGGING* ➜ *TCP/IP* menu shows the statistics for connections with the ▶▶ ICMP, ▶▶ **IP**, UDP and TCP protocols.

IP STATISTICS is shown when the menu is opened:

```
R232bw Setup Tool            Funkwerk Enterprise Communications GmbH
[MONITOR][IP]: IP Statistics                              MyGateway

InReceives        3912           OutNoRoutes      0
InHdrErrors       0              ReasmTimeout     500
InAddrErrors      0              ReasmReqds       0
ForwDatagrams     0              ReasmOKs         0
InUnknownProtos   0              ReasmFails       0
InDiscards        0              FragOKs          0
InDelivers        3321           FragFails        0
OutRequests       9              FragCreates      0
OutDiscards       0              RoutingDiscards  0

ICMP Statistics   TCP Statistics   UDP Statistics

EXIT

       I(C)MP           (I)P           (U)DP          (T)CP
```

The display is updated at 1-second intervals.

The meaning of the MIB variables can be found in the **MIB Reference** in the IP group of the ip, icpm, tcp and udp tables. (These are located in the download section of bintec products at www.funkwerk-ec.com.)

You can obtain the respective list either by selecting the *ICMP STATISTICS*, *IP STATISTICS*, *UDP STATISTICS* and *TCP STATISTICS* menus, or by pressing the buttons indicated in the help line at the bottom edge of the window:

■ Select **C** to display statistical data for ICMP.

■ Select **I** to display statistical data for IP.

■ Select **U** to display statistical data for UDP.

■ Select **T** to display statistical data for TCP.

8 Submenu IPSec

The ***MONITORING AND DEBBUGING*** ➜ ***IPSEC*** submenu provides access to the following submenus:

■ ***GLOBAL STATISTICS***

■ ***IKE SECURITY ASSOCIATIONS***

■ ***IPSEC SA BUNDLES***

Here you can show the global IPSec statistics, IKE Security Associations and IPSec Security Associations Bundles. The menu accordingly has three submenus, which are described in the following chapters.

8.1 Submenu Global Statistics

All the fields in the ***MONITORING AND DEBUGGING*** ➜ ***IPSEC*** ➜ ***GLOBAL STATISTICS*** menu are read only, i.e. you can show the statistics here, but cannot make any changes to the configuration.

The menu has the following structure (the values shown are only examples):

```
R232bw Setup Tool              Funkwerk Enterprise Communications GmbH
[MONITOR][IPSEC][STATS]: IPSec Monitoring -            MyGateway
                      Global Statistics


  Peers    Up    :  10    /16      Dormant: 6        Blocked: 0


  SAs      Phase 1:  10   /30       Phase 2: 10    /30


  Packets          In          Out

         Total  :  850          600
         Passed :  50           50
         Dropped:  30           40
         Protect:  770          510
         Errors :  0            0


                           EXIT

```

The display is updated every 1 second.

The meaning of the fields and their values is given below:

Field	Description
Peers Up	Shows the number of active peers (***OPERSTATUS*** = *up*) from the number of configured peers.
Peers Dormant	Shows the number of inactive peers (***OPERSTATUS*** = *dormant*).
Peers Blocked	Shows the number of blocked peers (***OPERSTATUS*** = *blocked*).
SAs Phase 1	Shows the number of active phase 1 SAs (***STATE*** = established) from the total number of phase 1 SAs. (See "Submenu IKE Security Associations" on page 24.)

Field	Description
SAs Phase 2	Shows the number of active phase 2 SAs (**STATE** = *established*) from the total number of phase 2 SAs. (See "Submenu IPSec SA Bundles" on page 26.)
Packets In/Out	Shows the number of packets that have been processed in a certain way: ■ *Total*: The total number of processed packets. ■ *Passed*: The number of packets forwarded in plain language. ■ *Dropped*: The number of packets discarded. ■ *Protect*: The number of packets protected by IPSec. ■ *Errors*: The number of packets in which errors occurred during processing.

Table 8-1:   *MONITORING AND DEBUGGING* ➜ *IPSEC* ➜ *GLOBAL STATISTICS*

8.2   Submenu IKE Security Associations

The next monitoring submenu (*MONITORING AND DEBUGGING* ➜ *IPSEC* ➜ *IKE SECURITY ASSOCIATIONS*) shows statistics for the IKE SAs. The menu has the following structure (the values shown are only examples):

```
R232bw Setup Tool              Funkwerk Enterprise Communications GmbH
[MONITOR][IPSEC][IKE SAS]: IPSec Monitoring -              MyGateway
                         IKE SAs

T: xch.-Type: B=Base      I=Id-prot.  O=auth-Only A=Aggressive
A: Auth-Meth: P=P-S-Key   D=DSA-sign. S=RSA-sign. E=RSA-encryption
R: Role     : I=Initiator R=Responder
S: State    : N=Negotiate E=Establ.  D=Delete W=Waiting-for-remove
E: Enc.-Alg : d=DES D=3ES B=Blowfish  C=Cast R=Rijndael T=Twofish
H: Hash-Alg : M=MD5        S=SHA1      T=Tiger      R=Ripemd160
type 'h' to toggle this help

Remote ID                      Remote IP Local ID       TARSEH

C=DE,O=TC TrustCenter AG,OU=TC  10.1.1.2 C=DE,O=TC Trust ISREBM




     DELETE            EXIT


```

The meaning of the characters in the **TARSEH** column (last column on the right below the help section of the menu window) is explained at the top of the menu window; the example shown above therefore has the following meaning:

Field	Description
Remote ID	Shows the ID of the remote peer. Authentication in the example uses certificates; the remote ID thus consists of quotes from the peer's certificate.
Remote IP	Shows the official IP address of the remote peer.

Field	Description
Local ID	Shows the local ID. This ID also consists of quotes from the certificate used for authentication.
TARSEH	Shows the combination of the parameters explained in the help section of the menu window. The example ISREBM thus means: ■ Exchange type: id_protect (*I*) ■ Authentication method: RSA signatures (*S*) ■ Role: Responder (*R*) ■ Status: Established (*E*) ■ Encryption algorithm: Blowfish (*B*) ■ Hash algorithm: MD5 (*M*)

Table 8-2:   *MONITORING AND DEBUGGING* ➜ *IPSEC* ➜ *IKE SECURITY ASSOCIATIONS*

You can toggle the help sector by pressing the **h** button.

8.3   Submenu IPSec SA Bundles

The next submenu (*MONITORING AND DEBUGGING* ➜ *IPSEC* ➜ *IPSEC SA BUNDLES*) shows the IPSec Security Associations negotiated in IPSec phase 2. The menu has the following structure:

```
R232bw Setup Tool              Funkwerk Enterprise Communications GmbH
[MONITOR][IPSEC][IPSEC BUNDLES]: IPSec Monitoring -          MyGateway
                              IPSec SA Bundles

 Local          LPort Pto  Remote            RPort CEA   In   Out

 192.168.1.9/24   0    all  192.168.2.0/24     0    -E-   888  1232




    DELETE              EXIT

```

The fields have the following meaning:

Field	Description
Local	Shows the local ➤➤ **IP address**, the address range or the network protected by this SA.
LPort	Shows the local ➤➤ **port** number or port number range protected by this SA.
Pto	Shows the layer 4 protocol of the data traffic protected by this SA (*0* = any).
Remote	Shows the remote IP address, the address range or the network protected by this SA.
RPort	Shows the remote port number or port number range protected by this SA.

Field	Description
CEA	Shows which IPSec protocols are used for the SA. ■ *C* = IPComp ■ *E* = ESP ■ *A* = AH.
In	Shows the number of bytes received via this SA.
Out	Shows the number of bytes sent via this SA.

Table 8-3:   *MONITORING AND DEBUGGING* ➜ *IPSEC* ➜ *IPSEC SA BUNDLES*

Note that the display of the tagged entry is not updated.

Monitoring and Debugging

9   ATM/OAM Submenu

The *ATM/OAM* submenu is described below.

The *MONITORING AND DEBUGGING* ➜ *ATM/OAM* menu shows statistics values for
the ATM interface.

```
R232bw Setup Tool              Funkwerk Enterprise Communications GmbH
[MONITOR][ATM]: ATM Interface Monitoring                      MyGateway


  ATM Interface                    ar7sar-3
  Operational Status               up

  RX Rate (b/s)      1184000    TX Rate (b/s)       160000
  Received Octets    0           Transmit Octets     0
  Received Errors    0           Transmit Errors     0
                                 Transmit Discards   0


  OAM F4 (Virtual path level) >

  OAM F5 (Virtual channel level) >



  EXIT

```

The display is updated at 1-second intervals.

The menu contains the following fields:

Field	Description
ATM Interface	Name of ATM interface.
Operational Status	Shows the operational status of the ATM interface. Possible values: *up*, *down*.
RX Rate (b/s)	Shows the data rate in the receive direction in bits per second.
Received Octets	Shows the total number of octets received.

Field	Description
Received Errors	Shows the total number of errors in the receive direction.
TX Rate (b/s)	Shows the data rate in the transmit direction in bits per second.
Transmit Octets	Shows the total number of octets sent.
Transmit Errors	Shows the total number of errors in the transmit direction.
Transmit Discards	Shows the number of packets discarded in the transmit direction.

Table 9-1:   ***ATM/OAM*** menu fields

9.1   OAM F4 (Virtual path level) Submenu

The *OAM F4 (VIRTUAL PATH LEVEL)* submenu is described below.

The *MONITORING AND DEBUGGING* ➜ *ATM/OAM* ➜ *OAM F4 (VIRTUAL PATH LEVEL)* menu shows the OAM statistics for a virtual path (OAM level F4; OAM:

Operation, Administration and Maintenance; for more information see **ATM User Network Interface Specification** and **ITU I.160**).

```
R232bw Setup Tool              Funkwerk Enterprise Communications GmbH
[MONITOR][ATM][OAM F4]: OAM Interface Monitoring            MyGateway


 Virtual path connection (VPC)    Vpi:1
 Operational Status               end to end up


 F4 OAM flows         End to end              Segment
                      RX          TX          RX          TX

 AIS                  0           0           0           0
 RDI                  0           0           0           0
 CC                   0           0           0           0
 Loopback             0           0           0           0




 EXIT

```

The menu contains the following fields:

Field	Description
Virtual path connection (VPC)	Selection of the VPI value of the connection over the virtual path.

Field	Description
Operational Status	Shows the operational status of the VPC. Possible values: ■ *end to end up*: The connection between the endpoints of the VPC is active. ■ *end to end down:*The connection between the endpoints of the VPC is inactive. ■ *local up end to end unknown*: The local endpoint is active. The status of the remote endpoint is unknown. ■ *local down*: The local endpoint is inactive. The status of the remote endpoint is unknown.

Field	Description
End to end or Segment	Indicates the number of received (RX) and transmitted (TX) monitoring and error alarm signals at the endpoints of the VPC (*END TO END*) or for the segment connection (segment = connection of the local endpoint to the next connection point) (*SEGMENT*): ■ *AIS*: Number of AIS cells (Alarm Indication Signal) since the last change of the router's internal AIS status. Is sent as soon as a transmission error is detected or an error message is received from another unit in the transmission path. ■ *RDI*: Number of RDI cells (Remote Defect Indication) since the last change of the router's internal RDI status. Error alarm signal that is passed to all stations in the direction of data flow. ■ *CC*: Number of CC cells (Continuity Check) during the current CC activation sequence. ■ *Loopback*: Number of loopback cells within this sequence.

Table 9-2:   *OAM F4 (VIRTUAL PATH LEVEL)* menu fields

9.2   OAM F5 (Virtual channel level) Submenu

The *OAM F5 (VIRTUAL CHANNEL LEVEL)* submenu is described below.

The *MONITORING AND DEBUGGING* ➜ *AMT/OAM* ➜ *OAM F5 (VIRTUAL CHANNEL LEVEL)* menu shows the OAM statistics for a virtual channel (OAM level F5; for

more information see **ATM User Network Interface Specification** and **ITU I.160**).

```
R232bw Setup Tool                   Funkwerk Enterprise Communications GmbH
[MONITOR][ATM][OAM F5]: OAM Interface Monitoring              MyGateway


 Virtual channel connection (VCC) Vpi:1     Vci:32
 Operational Status                  end to end up


 F5 OAM flows        End to end                 Segment
                     RX          TX             RX          TX

 AIS                 0           0              0           0
 RDI                 0           0              0           0
 CC                  0           0              0           0
 Loopback            0           0              0           0




 EXIT

```

The menu contains the following fields:

Field	Description
Virtual channel connection (VCC)	Selection of the VPI/VCI combination for the connection over the virtual channel.

Field	Description
Operational Status	Shows the operational status of the VCC. Possible values:
	■ *end to end up*: The connection between the endpoints of the VCC is active.
	■ *end to end down:*The connection between the endpoints of the VCC is inactive.
	■ *local up end to end unknown*: The local endpoint is active. The status of the remote endpoint is unknown.
	■ *local down*: The local endpoint is inactive. The status of the remote endpoint is unknown.

Field	Description
End to end or Segment	Indicates the number of received (RX) and transmitted (TX) monitoring and error alarm signals at the endpoints of the VCC (*END TO END*) or for the segment connection (segment = connection of the local endpoint to the next connection point) (*SEGMENT*): ■ *AIS*: Number of AIS cells (Alarm Indication Signal) since the last change of the router's internal AIS status. Is sent as soon as a transmission error is detected or an error message is received from another unit in the transmission path. ■ *RDI*: Number of RDI cells (Remote Defect Indication) since the last change of the router's internal RDI status. Error alarm signal that is passed to all stations in the direction of data flow. ■ *CC*: Number of CC cells (Continuity Check) during the current CC activation sequence. ■ *Loopback*: Number of loopback cells within this sequence.

Table 9-3: **OAM F5 (*VIRTUAL CHANNEL LEVEL*)** menu fields

10   ADSL Submenu

The *ADSL* submenu is described below.

The *MONITORING AND DEBUGGING* ➜ *ADSL* menu shows connection parameters and information about the hardware used (*ATU-R*: ADSL Transceiver Unit Remote Terminal End, i.e. the local ADSL unit; *ATU-C*: ADSL Transceiver Unit Central Office End, i.e. the ADSL unit at the local exchange).

```
R232bw Setup Tool            Funkwerk Enterprise Communications GmbH
[MONITOR][ADSL]: ADSL monitoring                           MyGateway

 Physical parameters         ATU-R             ATU-C
   Vendor ID                                   0x43545354
   Version number                              0x01
   Current status
   Current output power       13                18
   Current noise margin       24                -
   Current attenuation        33                -
 Channel parameters
   Tx rate (kb/s)             160               1184

 ATU-R Performance parameters
   Framing (LOF)              0             Received blocks    0
   Signal (LOS)               0             Transmitted blocks 0
   Power (LPR)                0             Corrected blocks   0
   Errored seconds (ES)       0             Uncorrect blocks   0

 EXIT
```

The menu contains the following fields:

Field	Description
Vendor ID	The ID of the equipment manufacturer.
Version Number	The manufacturer's version number, which is sent by the ATU as part of the initialization message.

Field	Description
Current status	Current status of ATU-R or ATU-C. Possible values: ■ *no defect*: The line is working correctly. ■ *loss of framing*: Error, as no valid frame has been received. ■ *loss of signal*: Error, as no signal is received. ■ *loss of power*: Error due to loss of power.
Current output power	The total output power sent by this ATU and measured during the last activation phase.
Current noise margin	The noise margin of the received signal measured by this ATU in dB.
Current attenuation	Line attentuation, i.e. measured difference between transmit and receive power.
Tx rate (kb/s)	Current data transmission rate in the transmit direction in kbits per second.
Framing (LOF)	Number of Loss of Framing errors since router reset.
Signal (LOS)	Number of Loss of Signal errors since router reset.
Power (LRP)	Number of Loss of Power errors since router reset.
Errored seconds (ES)	Number of 1-second intervals with 1 or more CRC, LOS or SEF (Severely Errored Frame) errors (Errored Seconds) since router reset.
Received blocks	Number of all received coded blocks since router reset.
Transmitted blocks	Number of all transmitted coded blocks since router reset.

Field	Description
Corrected blocks	Number of all blocks with corrected errors since router reset.
Uncorrect blocks	Number of all blocks with uncorrected errors since router reset.

Table 10-1:   *ADSL* menu fields

10 ADSL Submenu

Monitoring and Debugging

11   IP QoS Submenu

The *MONITORING AND DEBUGGING* ➜ *IP QOS* submenu is described below.

The **IP QOS** menu shows QoS-specific statistics information for interfaces to which a QoS Scheduling algorithm has been assigned. These values are taken from the *IFTABLE* and cannot be changed.

```
R232bw Setup Tool              Funkwerk Enterprise Communications GmbH
[MONITOR][IP QOS]: IP QoS Interface Monitoring              MyGateway

  Interface                        ethoa50-0
  Operational Status               up

  Nominal Transmit Rate            2048000
  Maximum Transmit Rate            192000

  Received Packets                 1075
  Received Octets                  66650

  Transmit Packets                 2334382
  Transmit Octets                  144731684

  QoS Policy Statistics >


  EXIT
```

Using the arrow keys or the space bar on your keyboard, you can choose which interface statistics you want to be displayed. The following values are shown:

Field	Description
Interface	Displays the selection of the interface for which QoS has been configured and whose QoS statistics are to be displayed.
Operational Status	Displays the current operational status of the selected interface (*OPERSTATUS* in the *IFTABLE*).
Nominal Transmit Rate	Displays the maximum overall data transmission rate in bits per second. The value displayed corresponds to *IFTABLE: SPEED*.

Field	Description
Maximum Transmit Rate	Displays the maximum data rate specified for this interface in bits per second in the transmit direction (the value is specified in the *INTERFACES AND POLICIES* ➜ *<Interface>* ➜ *QoS SCHEDULING AND SHAPING* submenu).
Received Packets	Displays the number of packets received over the selected interface since the last change to the *up* status. The counter for Ethernet Interfaces, however, is not reset by a state transition.
Received Octets	Displays the number of octets received over the selected interface since the last change to the *up* status. The counter for Ethernet Interfaces, however, is not reset by a state transition.
Transmit Packets	Displays the number of packets sent over the selected interface since the last change to the *up* status. The counter for Ethernet Interfaces, however, is not reset by a state transition.
Transmit Octets	Displays the number of octets sent over the selected interface since the last change to the *up* status. The counter for Ethernet Interfaces, however, is not reset by a state transition.

Table 11-1: *MONITORING AND DEBIGGING* ➜ *IP QoS* menu fields

11.1 QoS Policy Statistics Submenu

The *QoS POLICY STATISTICS* submenu is described below.

Opening the *MONITORING AND DEBUGGING* ➜ *IP QoS* ➜ *QoS POLICY STATISTICS* menu normally shows a view of the distribution of the whole bandwidth in the form of a bar graph (values are taken from the *QOSPOLICYSTATTABLE*, the refresh rate is set to one second).

```
R232bw Setup Tool            Funkwerk Enterprise Communications GmbH
[MONITOR][IP QOS][STATISTICS]: QoS Bandwidth                MyGateway
                              Distribution (ethoa50-0)

load        XXX agreed      ::: agreed but bounded    *** overbooked
    ^
    |      42       41   19
  + 100
    |
    |
    |
    |      :::       ***
    |      :::       ***
    |      :::       ***
    |      :::       *** ***
    |      :::       XXX XXX
    +-------------------------------------------------------------->
           HP        1   2   3   DEF      classes

  EXIT

 (d)istribution   (c)lasses   (t)os   (i)nterface statistics
```

The graph shows the percentage share of the individual configured QoS packet classes in terms of the total bandwidth (*MAXIMUM TRANSMIT RATE*). The bars contain the bandwidth distribution of the QoS packet classes.

The meaning of the different graphical representation of the bars is as follows:

■ *agreed (xxx)*: Share of the packets within the guaranteed bandwidth for this QoS packet class.

■ *agreed but bounded (:::)* : Share of the packets within the maximum guaranteed bandwidth for this QoS packet class.

■ *overbooked* (***): Overbooking of the guaranteed (not bounded) or maximum (bounded) bandwidth. This overbooking is only allowed in the "not bounded" mode.

Detailed statistics values can still be displayed. You can change the display with the following keyboard shortcuts as described in the help line:

■ *c* = classes: Display of statistics values for classes

■ *t* = tos: Display of statistics values for TOS

■ *i* = interface statistics: Display of statistics values for interfaces

■   *d* = distribution: returns to the default display (bar graph).

The **RESET STATISTICS** button resets all values in the respective window to *0*. Since data are collected from different tables of the MIB, only the counter used for the current view is actually reset.

CLASSES

```
R232bw Setup Tool              Funkwerk Enterprise Communications GmbH
[MONITOR][IP QOS][STATISTICS]: QoS Class                      MyGateway
                               Statistics (ethoa50-0)

Class Pkts Send   Dropped Queued  Octs Send    Dropped  Queued

DEF        0      0       0             0       0        0
N 1        0      0       0             0       0        0
N 2        167550 355049  22            6702000 19172646 880
N 3        292021 735122  405          1168080 39696588 16200
HP         19695  0       13           7878320 0        520




   EXIT                     RESET STATISTICS

 (d)istribution     (c)lasses     (t)os    (i)nterface statistics
```

The following values (taken from the *QOSPOLICYSTATTABLE*) are shown:

Field	Description
Class	Displays the Class Type of the configured QoS packet class. Abbreviations have the following meaning: ■ N = normal ■ HP = high priority ■ DEF = default

Field	Description
Pkts	Displays the number of packets of this QoS packet class: ■ *Send*: Packets sent ■ *Dropped*: Packets dropped ■ *Queued*: Packets in the queue
Octs	Displays the number of octets of this QoS packet class: ■ *Send*: Octets sent ■ *Dropped*: Octets dropped ■ *Queued*: Octets in the queue

Table 11-2:   *QoS POLICY STATISTICS* ➜ *CLASSES* submenu fields

TOS

```
R232bw Setup Tool              Funkwerk Enterprise Communications GmbH
[MONITOR][IP QOS][STATISTICS]: TOS Statistics                MyGateway
                               (ethoa50-0)

TOS OutPkts OutOctets InPkts  InOctets PktsDropped OctetsDropped

00  0        0         0       0        0           0
01  0        0         1135    68100    0           0
10  0        0         700     18000    0           0








   EXIT                      RESET STATISTICS

  (d)istribution      (c)lasses      (t)os     (i)nterface statistics
```

The following values (taken from the *QOSTOSSTATTABLE*) are shown:

Field	Description
TOS	Displays the value of the TOS field of the IP packet.
OutPkts	Displays the number of packets sent with the value entered under TOS.
OutOctets	Displays the number of octets sent with the value entered under TOS.
InPkts	Displays the number of packets received with the value entered under TOS.
InOctets	Displays the number of octets received with the value entered under TOS.
PktsDropped	Displays the number of packets dropped with the value entered under TOS.
OctetsDropped	Displays the number of octets dropped with the value entered under TOS.

Table 11-3: *QOS POLICY STATISTICS ➜ TOS* submenu fields

INTERFACE STATISTICS

```
R232bw Setup Tool              Funkwerk Enterprise Communications GmbH
[MONITOR][IP QOS][STATISTICS]: QoS Interface                  MyGateway
                               Statistics (ethoa50-0)


  Transmit Packets  2469015
  Transmit Octets   98760600

  Queued Packets    417
  Queued Octets     16680

  Dropped Packets   1090901
  Dropped Octets    43636040




  EXIT                    RESET STATISTICS

 (d)istribution      (c)lasses      (t)os      (i)nterface statistics
```

The following values (taken from the *QOSIFSTATTABLE*) are shown:

Field	Description
Transmit Packets	Displays the number of packets sent over the selected interface.
Transmit Octets	Displays the number of octets sent over the selected interface.
Queued Packets	Displays the number of packets in the queue of the selected interface.
Queued Octets	Displays the number of octets in the queue of the selected interface.
Dropped Packets	Displays the number of packets dropped at this interface.
Dropped Octets	Displays the number of octets dropped at this interface.

Table 11-4: *QOS POLICY STATISTICS* ➜ *INTERFACE STATISTICS* submenu fields

11 IP QoS Submenu

12 SSHD Submenu

The fields of the *SSH DAEMON* menu are described below.

In the *SECURITY* ➜ *SSH DAEMON* ➜ *MONITORING* menu you can view the SSH client connection that is set up.

```
R232bw Setup Tool              Funkwerk Enterprise Communications GmbH
[MONITOR][SSHD]: SSH Daemon active Sessions                  MyGateway

User        IP-Address         State    Connect-Time

admin           192.168.1.1:2013      active   Thu Jan 1  4:51:07  2005




                     EXIT


```

If you select the connection by pressing **Return**, the following details are shown:

```
R232bw Setup Tool              Funkwerk Enterprise Communications GmbH
[MONITOR][SSHD][SESSIONS][][DETAILS]: SSH Daemon            MyGateway
                          Session Details


          Account                    admin
          Connection State           active
          Remote IP-Address          192.168.1.1:2013

          Negotiated Cipher          aes128-cbc
          Negotiated MAC             hmac-sha1
          Negotiated Compression     none

          Established Time           00:06:02
          Total Bytes IN             26616
          Total Bytes OUT            31180


                     EXIT


```

These details inform about the following values:

Field	Value
Account	The account used for the client's successful login.
Connection State	The connection state of this client.
Remote IP-Address	The IP address and port of this client.
Negotiated Cipher	The cipher negotiated with this client.
Negotiated MAC	The MAC (message authentication code) negotiated with this client.
Negotiated Compression	The compression algorithm negotiated with this client.
Established Time	Duration of the SSH connection.
Total Bytes IN	The number of bytes received from this client.
Total Bytes OUT	The number of bytes received from this client.

Table 12-1:   Fields of the *MONITORING AND DEBUGGING* ➜ *SSH DAEMON* ➜ *EDIT*
                menu

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