

User's Guide
bintec R4100 / R4300
Monitoring and Debugging

Purpose This document is part of the user's guide to the installation and configuration of bintec gateways running software release 7.4.3 or later. For up-to-the-minute information and instructions concerning the latest software release, you should always read our **Release Notes**, especially when carrying out a software update to a later release level. The latest **Release Notes** can be found at www.funkwerk-ec.com.

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Guidelines and standards bintec gateways comply with the following guidelines and standards:

R&TTE Directive 1999/5/EG

CE marking for all EU countries and Switzerland

You will find detailed information in the Declarations of Conformity at www.funkwerk-ec.com.

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1 Monitoring and Debugging Menu

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

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH
[MONITOR]: Monitoring and Debugging	MyGateway
ISDN Monitor	ATM/OAM
ISDN Credits	ADSL
xDSL Credits	
X.25 Monitor	
Interfaces	BRRP
Messages	
Email Alert	
TCP/IP	IP QoS
IPSec	SSH
OSPF	
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.
X.25 Monitor	Protocols incoming and outgoing X.25 calls.
Interfaces	For monitoring the traffic of the individual interfaces. The interface status can also be changed via this menu (<i>up, down, reset</i>).

Menu	Meaning
Messages	Shows system messages generated by the gateway's logging and accounting mechanism.
TCP/IP	This menu is for monitoring the IP traffic of the individual protocols.
IPSec	This menu shows global IPSec statistics and lists the <i>IKE SECURITY ASSOCIATIONS</i> and <i>IPSEC SA BUNDLES</i> of all active IPSec tunnels.
OSPF	This menu is for monitoring the OSPF information.
BRRP	This menu contains statistical information about the individual "virtual routers" in BRRP.
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:

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.

```

R4100 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

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.

```

R4100 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.

R4100 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:

R4100 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 <i>MEASURE TIME (SEC)</i> (see menu <i>CREDITS</i> → <i>ISDN CREDITS</i>).

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) .
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



Note

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:

R4100 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 → <i>xDSL CREDITS</i> → 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

**Note**

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 X.25 Monitor Submenu

The *X.25 MONITOR* is described below.

The *MONITORING AND DEBUGGING* → *X.25 MONITOR* menu initially displays all active X.25 connections. These calls include leased and dialup connections that have been set up via public X.25 networks or ISDN.

R4100 Setup Tool		Funkwerk Enterprise Communications GmbH		
[MONITOR] [X.25 CALLS]: X.25 Monitor		MyGateway		
From	To	Calling Addr	Called Addr	Duration
EXIT				
(c)alls	(h)istory	(d)etails	(s)tatistics	

As in the ISDN Monitor menu the menu options (c, h, d and s) are displayed at the bottom of the screen. These options open up lists containing certain statistics on X.25 calls.

The (c) listing displays all active X.25 connections again.

The **(H)ISTORY** listing shows the last ten terminated X.25 connections (incoming and outgoing) since the last system reboot.

R4100 Setup Tool		Funkwerk Enterprise Communications GmbH	
[MONITOR] [X.25 HISTORY]: X.25 Monitor		MyGateway	
From	To	Starttime	Duration Cause
EXIT			

Additional information on terminated calls can be displayed by selecting a call entry from the **(c)alls** or **(h)istory** list and press **d**.

The **(D)ETAILS** listing shows specific information on individual active or terminated calls.

R4100 Setup Tool		Funkwerk Enterprise Communications GmbH	
[MONITOR] [X.25 DETAILS]: X.25 Monitor - Details		MyGateway	
Clear Cause	(0x0d) not obtainable	Clear Diag	(0x43) invalid called DTE add
Proto ID	?	State	
Source:			
Interface	local		
VC Number	??		
X.25 Address			
Link Address			
Destination:			
Interface	??		
VC Number	?		
X.25 Address	??		
Link Address			
Packet Size (In/Out)	??/?	Window Size (In/Out)	??/?
EXIT			

The **(s)STATISTICS** listing shows the transfer activities of individual active X.25 calls.

R4100 Setup Tool		Funkwerk Enterprise Communications GmbH		
[MONITOR] [X.25 STATISTICS]: X.25 Monitor		MyGateway		
From	To	Calling Addr	Called Addr	Duration
EXIT				

5 Interfaces Submenu

The **INTERFACES** submenu is described below.

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

The values for two interfaces are displayed side by side:

R4100 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. <ul style="list-style-type: none"> ■ ISDN: Total number of active B-channels. ■ DSL: <i>N/A</i> or <i>1</i> <i>N/A</i> 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**.

```

R4100 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

```


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 sub-system (**SUBJ**) and priority (**LEV**).

R4100 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.

```
R4100 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 Email Alert Submenu

The **EMAIL ALERT** submenu is described below.

It is possible to send syslog messages from the gateway to any syslog host. The gateway also provides for an email alert function: Depending on the configuration, e-mails are sent to the administrator as soon as relevant syslog messages occur.

Configuration is made in the **MONITORING AND DEBUGGING** → **EMAIL ALERT** menu:
(The display contains example values)

Field	Description				
R4100 Setup Tool	Funkwerk Enterprise Communications GmbH				
[ALERT NOTIFICATION]: Settings	MyGateway				
Global notification settings:					
Adminstatus	: enable				
SMTP Server	: mailserver01				
Originator	: MyGateway@Company.org				
max. Mails/min	: 6				
Authentication Settings >					
Current notification list:					
Receiver	Expression	Time	Count	compress	Level
admin@Comany.org	*dialup*	60	1	disable	debug
ADD	DELETE	CANCEL	SAVEs		

The menu contains the following fields:

Field	Description
Adminstatus	For activating or deactivating the email alert function. Possible settings: <ul style="list-style-type: none"> ■ <i>enable</i> (default value) ■ <i>disable</i>

Field	Description
SMTP Server	For entering the address (>> IP address or valid >> DNS name) of the mail server to be used for sending the mail. The entry is limited to 40 characters.
Originator	Here you enter the mail address to be entered in the sender field of the email.
max. Mails/min	Here you can limit the number of outgoing mails per minute. Possible values are 1 to 30, the default value is 6.
Last Error	This value is only shown in the event of an error and contains the last error message that occurred.

Table 7-1: **EMAIL ALERT** menu fields

The notification rules already configured are shown in the bottom part of the menu window. You can configure a new rule or edit an existing one with **ADD/EDIT**:

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH
[ALERT NOTIFICATION] [ADD]	MyGateway
Notification rule configuration:	
Receiver	: admin@Company.org
Contents	: *dialup*
Level	: debug
Timeout	: 60
Messages	: 1
Compress	: disable
Select subsystems:	
<X> ACCOUNT	<X> ISDN
<X> CONFIG	<X> SNMP
<X> MODEM	<X> RIP
<X> INET	<X> X21
<X> X25	<X> ETHER
<X> CAPI	<X> RADIUS
<X> PPP	<X> OSPF
<X> ATM	<X> IPSEC
<X> AUX	
SAVE	CANCEL

The menu consists of the following fields:

Field	Description
Receiver	<p>Here you enter the email address of the receiver.</p> <p>The entry is limited to 40 characters.</p>
Contents	<p>You must enter a "regular expression" here. This must occur in a syslog message as a necessary condition for triggering an alert.</p> <p>The entry is limited to 55 characters.</p> <p>Bear in mind that without the use of wildcards (e.g. "*"), only those strings that correspond exactly to the entry fulfill the condition. The "regular expression" entered therefore usually contains wildcards. To be informed of all syslog messages of the selected level, just enter "*".</p> <p>Example: To record all messages that contain the character string "dialup", enter <i>*dialup*</i> as CONTENTS.</p>
Level	<p>Here you select the syslog level at which the string configured in the CONTENTS field must occur to trigger an email alert.</p> <p>Possible settings are all the values available in the MESSAGE LEVEL FOR THE SYSLOG TABLE field of the SYSTEM menu; the default value is emergency.</p>
Timeout	<p>Enter the maximum number of seconds the gateway must wait after a relevant event before it is forced to send the alert mail.</p> <p>If MESSAGES is configured, the mail is sent when the number of messages entered is reached, even if the timeout entered here has not yet expired.</p> <p>Possible values are 0 to 86400. A value of 0 deactivates the timeout and the default value is 60.</p>

Field	Description
Messages	Enter the number of syslog messages that must be reached before an email alert is sent for this case. If TIMEOUT is configured, the mail is sent when this expires, even if the number of messages has not been reached. Possible values are 1 to 99; the default value is 1.
Compress	Here you can select whether the email alert text is to be shortened. The mail then contains syslog messages with identical text only once plus the number of relevant events. Possible settings: <input type="checkbox"/> <i>disable</i> - default value <input type="checkbox"/> <i>enable</i>
Select subsystems	Here you select the subsystems to be monitored. Select a subsystem with the arrow keys and activate or deactivate it with the space bar.

Table 7-2: **EMAIL ALERT** → **ADD/EDIT** menu fields

The **EMAIL ALERT** menu provides access to the **AUTHENTICATION SETTINGS** menu.

7.1 Authentication Settings Menu

The submenu **Authentication Settings** is described below.

Your gateway supports a possibly required SMTP-authentication for Email Alert. The configuration is carried out in the **MONITORING AND DEBUGGING** → **EMAIL ALERT** → **AUTHENTICATION SETTINGS** submenu (the screenshot contains example values):

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH
[ALERT NOTIFICATION] [SMTP]: Authentication	MyGateway
SMTP Authentication Settings:	
<pre> Server needs Authentication : SMTP after POP POP3 Server : Username : Password : POP3 Timeout: 600 </pre>	
SAVE	CANCEL

The menu offers the following options:

Field	Value
Server needs Authentication	<p>Here you choose the desired SMTP authentication.</p> <p>Available choices are:</p> <ul style="list-style-type: none"> <input type="checkbox"/> <i>none</i> (default value) <input type="checkbox"/> <i>Enhanced SMTP</i> <input type="checkbox"/> <i>SMTP after POP.</i>
POP3 Server	Domain name or IP address of the POP3 server to which the authentication is sent.
Username	Username for login to the email server.
Password	Password for login to the email server.
POP3 Timeout	<p>Time after which the authentication is considered invalid.</p> <p>Possible values are 60 to 3600 seconds, default is 600.</p>

Table 7-3: **MONITORING AND DEBUGGING → EMAIL ALERT → AUTHENTICATION SETTINGS**

8 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:

R4100 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 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.

9 IPSec Submenu

The **MONITORING AND DEBUGGING → 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.

9.1 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):

R4100 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 = <i>up</i>) from the number of configured peers.
Peers Dormant	Shows the number of inactive peers (OPERSTATUS = <i>dormant</i>).
Peers Blocked	Shows the number of blocked peers (OPERSTATUS = <i>blocked</i>).
SAs Phase 1	Shows the number of active phase 1 SAs (STATE = <i>established</i>) from the total number of phase 1 SAs. (See “Submenu IKE Security Associations” on page 30.)

Field	Description
SAs Phase 2	Shows the number of active phase 2 SAs (<i>STATE = established</i>) from the total number of phase 2 SAs. (See “Submenu IPSec SA Bundles” on page 32.)
Packets In/Out	Shows the number of packets that have been processed in a certain way: <ul style="list-style-type: none"> <li data-bbox="801 514 1300 570">■ <i>Total</i>: The total number of processed packets. <li data-bbox="801 599 1300 655">■ <i>Passed</i>: The number of packets forwarded in plain language. <li data-bbox="801 684 1300 741">■ <i>Dropped</i>: The number of packets discarded. <li data-bbox="801 770 1300 826">■ <i>Protect</i>: The number of packets protected by IPSec. <li data-bbox="801 855 1300 912">■ <i>Errors</i>: The number of packets in which errors occurred during processing.

Table 9-1: **MONITORING AND DEBUGGING → IPSEC → GLOBAL STATISTICS**

9.2 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):

```

R4100 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: <ul style="list-style-type: none"> ■ Exchange type: id_protect (<i>I</i>) ■ Authentication method: RSA signatures (<i>S</i>) ■ Role: Responder (<i>R</i>) ■ Status: Established (<i>E</i>) ■ Encryption algorithm: Blowfish (<i>B</i>) ■ Hash algorithm: MD5 (<i>M</i>)

Table 9-2: **MONITORING AND DEBUGGING → IPSEC → IKE SECURITY ASSOCIATIONS**

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

9.3 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:

R4100 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. <ul style="list-style-type: none">■ 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 9-3: **MONITORING AND DEBUGGING → IPSEC → IPSEC SA BUNDLES**

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

10 OSPF Submenu

The *OSPF* submenu is described below.

R4100 Setup Tool		Funkwerk Enterprise Communications GmbH			
[MONITOR] [OSPF]: OSPF Monitor		MyGateway			
Interface	DR	BDR	Admin Status	State	
en0-1	N/A	N/A	passive	N/A	=
en0-1-snap	N/A	N/A	passive	N/A	
vss8-0	N/A	N/A	passive	N/A	
vss8-0-snap	N/A	N/A	passive	N/A	v
Neighbor	Router ID	Interface	Retx Queue	State	
Area	Type	Link State ID	Router ID	Sequence	Age
EXIT					

The **MONITORING AND DEBUGGING → OSPF** menu is used for monitoring OSPF information (see manual chapter **IP → ROUTING PROTOCOLS → OSPF**).

The OSPF monitor is arranged horizontally in three sections and shows information about OSPF interfaces, the detected neighbor and the Link State Database entries.

Interfaces The **INTERFACES** section lists all activated OSPF interfaces (i.e. interfaces that have not been set to **OFF** in the **IP → OSPF → INTERFACES** menu).

Field	Description
Interface	Name of interface.

Field	Description
Designated Router (DR)	<p>IP address of designated router.</p> <p>The designated router generates network links and distributes these to all gateways within the BMA network (BMA = Broadcast Multi Access Network, e.g. Ethernet, FDDI, Tokenring).</p> <p>A designated router is not shown for non-BMA networks, e.g. X.25, Frame Relay, ATM.</p>
Backup Designated Router (BDR)	IP address of backup designated router.
Admin Status	Shows the OSPF Admin Status (<i>active</i> or <i>passive</i>) of the interface.
State	<p>The OSPF status of the interface shown here (OSPFIFSTATE) can have the following values:</p> <ul style="list-style-type: none"> ■ <i>down</i>: OSPF is not running on this interface. ■ <i>wait</i>: The initial phase of the OSPF, in which the DR and BDR are determined. ■ <i>PTP</i>: The interface is a point-to-point interface. DR or BDR are not shown. ■ <i>DR</i>: The gateway is the designated router within the BMA network.

Field	Description
State (cont.)	<ul style="list-style-type: none"> ■ <i>BDR</i>: The gateway is the backup designated router within the BMA network. ■ <i>DRouter</i>: Another gateway is designated router or backup designated router within the BMA network.

Table 10-1: OSPF monitor section *INTERFACE*

Neighbor The *NEIGHBOR* section lists the neighbor gateways that have been identified via the HELLO protocol.

Field	Description
Neighbor	The IP address of the neighbor gateway.
Router ID	The system-wide router ID of the neighbor gateway.
Interface	The interface over which this neighbor gateway was identified.
Retx Queue	<p>The size of the Retransmission Queue of this neighbor gateway.</p> <p>Periodic Link State Advertisements are sent to each "neighbor". The counter is incremented by 1 each time an advertisement is sent. The counter is decremented by 1 if an acknowledge (LSA of the neighbor) is received. If the two neighbors are not synchronous (link interrupted), the "Retx Queue" counts up continuously. This enables detection of the neighbor that cannot be reached direct.</p> <p>If a maximum (usually 3) is exceeded, the Link State Database is adjusted and sent to all gateways in the area via multicast.</p>

Field	Description
State	<p>The OSPF status with this neighbor gateway can have the following values:</p> <ul style="list-style-type: none"> ■ <i>init</i>: The initial phase. A HELLO packet is received from the neighbor. ■ <i>twoWay</i>: Bidirectional communication with the neighbor. The HELLO packets sent are accepted by the neighbor gateway (with correct parameters). ■ <i>EXstart</i>: The exchange of Database Description packets between the gateways has started. ■ <i>exchange</i>: Active exchange of Database Description packets with the neighbor. ■ <i>loading</i>: The gateway now exchanges Link State Advertisements with the neighbor. ■ <i>full</i>: The Link State Databases of the gateway and its neighbor are now synchronized.

Table 10-2: **NEIGHBOR** section

LSDB The headers of all Link State Advertisements (LSA) are listed in the section for the Link State Database.

Field	Description
Area	The area database to which the LSA is assigned.
Type	The LSA type. There are five LSA types: Router Link, Network Link, Summary Link, Summary ASBR, and AS External.
Link State ID	The Link State ID of the LSA. The meaning of the Link State ID depends on the type of advertisement.

Field	Description
Router ID	Identifies the gateway that has generated this LSA.
Sequence	The sequence number of the advertisement. Sequence numbers enable the gateway to determine whether its database is up to date or it must request an update.
Age	The age of the LSA (in seconds)

Table 10-3: **LSDB** section

14 BRRP Submenu

The **BRRP** submenu is described below.

R4100 Setup Tool			Funkwerk Enterprise Communications GmbH		
[BRRP] [MONITOR]: Virtual Router Monitoring			MyGateway		
VrID	Prio	State	Interface	Master-IP-Addr	Errors
1	100	down	en0-1-1	0.0.0.0	0
EXIT					

The **BRRP** menu displays a list of all "virtual routers".

The list contains the following data:

Column	Description
VrID	ID of the "virtual router"
Prio	Configured priority: <ul style="list-style-type: none"> ■ 255 = Master ■ <255 = Slave
State	The current state of the BRRP gateway in the "virtual router".
Interface	Interface within the "virtual router"
Master-IP-Addr	IP address of the virtual interface of the master.
Errors	Total sum of received defective packets.

Table 14-1: Virtual Router Monitoring List

Detailed statistical information about the individual “virtual routers” are displayed by positioning the cursor on the desired “virtual router” list entry and pressing the **Return** key.

R4100 Setup Tool		Funkwerk Enterprise Communications GmbH	
[BRRP] [MONITOR] [DETAILS]: Virtual Router Details		MyGateway	
Virtual Router ID	1		
Virtual Router State	backup		
Become Master	2		
Advertisements Received	23536		
Advertisement Interval Errors	0		
Version Errors	0		
Authentication Errors	0		
Authentication Type Mismatch	0		
Invalid Authentication Type	30		
Invalid Type Packets Received	0		
Packet Length Errors	0		
IP TTL Errors	0		
Checksum Errors	0		
EXIT			

The **BRRP** menu consists of the following fields:

Field	Description
Virtual Router ID	Here you select the ID of the “virtual router” whose statistics you wish to see.
Virtual Router State	<p>The current state of the BRRP gateway in the “virtual router”. This field can have the following values:</p> <ul style="list-style-type: none"> ■ <i>initialize</i>: The BRRP gateway waits for a startup event. ■ <i>backup</i>: The BRRP gateway monitors the reachability of the master router. ■ <i>master</i>: The BRRP gateway forwards packets to >>> IP addresses that are linked to this router.

Field	Description
Become Master	The total number of state transitions of the BRRP gateway to <i>master</i> .
Advertisements Received	The total number of BRRP advertisements received by BRRP gateway.
Advertisement Interval Errors	The total number of BRRP advertisement packets received whose advertisement interval differs from that configured on the local BRRP gateway.
Version Errors	The total number of BRRP packets received with unknown or unsupported version number.
Authentication Errors	The total number of BRRP packets received with wrong AUTHENTICATION KEY .
Authentication Type Mismatch	The total number of packets received in which the AUTHENTICATION TYPE is known, but not the same as the authentication type configured locally.
Invalid Authentication Type	The total number of packets received with a completely unknown authentication type.
Invalid Type Packets Received	The number of BRRP packets received by the “virtual router” with an invalid value in the ‘type’ field of the BRRP header. The correct value for ‘type’ is ‘1’ (‘advertisement’).
Packet Length Errors	The total number of packets received with a smaller packet length than the length specified in the BRRP header.
IP TTL Errors	The total number of BRRP packets received by the “virtual router” with IP TTL (Time-To-Live) not equal to 255.
Checksum Errors	The total number of BRRP packets received with an invalid BRRP checksum.

Table 14-2: **BRRP** menu fields

15 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.

R4100 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 <i>up</i> 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 <i>up</i> 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 <i>up</i> 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 <i>up</i> status. The counter for Ethernet Interfaces, however, is not reset by a state transition.

Table 15-1: **MONITORING AND DEBUGGING** → **IP QoS** menu fields

15.1 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).

- *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

R4100 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	0	0
N 1	0	0	0	0	0	0	0	0
N 2	167550	355049	22	22	6702000	19172646	880	880
N 3	292021	735122	405	405	1168080	39696588	16200	16200
HP	19695	0	13	13	7878320	0	520	520
EXIT				RESET STATISTICS				
(d)istribution		(c)lasses		(t)os		(i)nterface statistics		

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

Field	Description
Class	<p>Displays the Class Type of the configured QoS packet class.</p> <p>Abbreviations have the following meaning:</p> <ul style="list-style-type: none"> ■ N = normal ■ HP = high priority ■ DEF = default

Field	Description
Pkts	Displays the number of packets of this QoS packet class: <ul style="list-style-type: none"> ■ <i>Send</i>: Packets sent ■ <i>Dropped</i>: Packets dropped ■ <i>Queued</i>: Packets in the queue
Octs	Displays the number of octets of this QoS packet class: <ul style="list-style-type: none"> ■ <i>Send</i>: Octets sent ■ <i>Dropped</i>: Octets dropped ■ <i>Queued</i>: Octets in the queue

Table 15-2: **QoS POLICY STATISTICS** → **CLASSES** submenu fields**TOS**

R4100 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 15-3: **QoS POLICY STATISTICS** → **TOS** submenu fields

INTERFACE STATISTICS

R4100 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 15-4: **QoS POLICY STATISTICS** → **INTERFACE STATISTICS** submenu fields

16 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.

R4100 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:

R4100 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 16-1: Fields of the **MONITORING AND DEBUGGING → SSH DAEMON → EDIT** menu

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