

User's Guide
bintec R4100 / R4300
Security

Purpose This document is part of the user's guide to the installation and configuration of bintec gateways running software release 7.4.5 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 Security Menu

The **SECURITY** menu is described below.

```
R4100 Setup Tool                Funkwerk Enterprise Communications GmbH
[SECURITY]: Security Configuration                MyGateway

Cobion Orange Filter >
Access Lists >
Stateful Inspection >

SSH Daemon >

Local Services Access Control >

EXIT
```

The **SECURITY** menu is for configuring your gateway's security features.

It provides access to the following submenus:

- **COBION ORANGE FILTER**
- **ACCESS LISTS**
- **STATEFUL INSPECTION**
- **SSH DAEMON**
- **LOCAL SERVICES ACCESS CONTROL**

2 Cobion Orange Filter Submenu

The **COBION ORANGE FILTER** submenu is described below.

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH
[SECURITY][ORANGE FILTER]: Static Settings	MyGateway
<pre> Admin Status : disable Orange Filter Ticket: B2BT Ticket Status : Filtered Interface : none History Entries : 64 Configure Black List > Configure White List > Configure Filters > View History > SAVE CANCEL </pre>	

The **SECURITY → COBION ORANGE FILTER** menu is used for configuring a **URL**-based content filtering service, which accesses the OrangeFilter (previously a product of Cobion AG) from Internet Security Systems (www.iss.net) during operation and checks how a requested Internet page has been classified by the OrangeFilter. The action resulting from the classification is configured on the gateway.

The **SECURITY → COBION ORANGE FILTER** menu permits the configuration of basic parameters and access to other configuration menus:

- **CONFIGURE BLACK LIST**
- **CONFIGURE WHITE LIST**
- **CONFIGURE FILTERS**
- **VIEW HISTORY.**

The **COBION ORANGE FILTER** menu consists of the following fields:

Field	Description
Admin Status	<p>Here you can activate the filter.</p> <p>Possible settings:</p> <ul style="list-style-type: none"> ■ <i>disable</i> (default value): Content filtering is deactivated. ■ <i>enable</i>: Content filtering is activated. ■ <i>enable 30 day demo ticket</i>: Activates a 30-day demo license for the OrangeFilter.
Orange Filter Ticket	<p>Here you enter the number of the OrangeFilter license purchased. The preset code assigned by ISS designates the device type.</p> <p>This entry is only necessary for ADMIN STATUS = enable.</p>
Expiring Date	<p>This field is only shown if a license has been entered and checked.</p> <p>It shows the expiry date of the license (relative to the time set on the gateway) and cannot be edited.</p>
Ticket Status	<p>Shows the result of the last validity check of the license. The validity of the license is checked every 23 hours.</p>
Filtered Interface	<p>Here you select for which of the existing Ethernet interfaces content filtering is to be activated. Only one interface can be specified here.</p> <p>HTTP Internet pages that reach the gateway via this interface are then monitored by content filtering.</p> <p>The default value is <i>none</i>.</p>

Field	Description
History Entries	Here you define the number of entries to be saved in the content filtering history. Possible values are between 1 and 512 and the default value is 64.

Table 2-1: *COBION ORANGE FILTER* menu fields

2.1 Configure Black List Submenu

The *CONFIGURE BLACK LIST* submenu is described below.

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH
[SECURITY] [ORANGE FILTER] [BLACK LIST]: Url List	MyGateway
Black List:	
Url / Address	
www.rotton.com	
www.bielefeld.de	
ADD	DELETE
EXIT	

The *SECURITY* → *COBION ORANGE FILTER* → *CONFIGURE BLACK LIST* menu contains a list of all URLs and IP addresses that are blocked even if they would be admitted as a result of the filter configuration and the classification in the OrangeFilter (the example contains arbitrary values; the default configuration contains no entries).

You can add other URLs or IP addresses to the list using the **ADD** button. The length of an entry is limited to 60 characters. Addresses listed in the Black List are allowed automatically. It is not necessary to configure a suitable filter.

2.2 Configure White List Submenu

The **CONFIGURE WHITE LIST** submenu is described below.

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH
[SECURITY] [ORANGE FILTER] [WHITE LIST]: Url List	MyGateway
White List:	
Url / Address www.funkwerk-ec.com www.heise.de	
ADD	DELETE
EXIT	

The **SECURITY → COBION ORANGE FILTER → CONFIGURE WHITE LIST** menu contains a list of all URLs and IP addresses that can still be called up even if they are blocked as a result of the filter configuration and the classification in the OrangeFilter (the example contains arbitrary values; the default configuration contains no entries).

You can add other URLs or IP addresses to the list using the **ADD** button. The length of an entry is limited to 60 characters. Addresses listed in the White List are allowed automatically. It is not necessary to configure a suitable filter.

2.3 Configure Filters Submenu

The **CONFIGURE FILTERS** submenu is described below.

R4100 Setup Tool		Funkwerk Enterprise Communications GmbH			
[SECURITY][ORANGE FILTER][FILTER]: Filter List		MyGateway			
Content Filter List:					
Category	Day	Start	Stop	Action	Prio
Anonymous Proxies	Everyday	00:00	23:59	block	1
Criminal Activities	Everyday	00:00	23:59	block	11
Pornography/Nudity	Everyday	00:00	23:59	block	12
Unknown URL	Monday - Friday	00:00	23:59	logging	20
Ordering	Monday - Friday	00:00	23:59	logging	1
default behaviour	Everyday	00:00	23:59	allow	30
ADD		DELETE		EXIT	

The **SECURITY → COBION ORANGE FILTER → CONFIGURE FILTERS** menu is for configuring which categories of Internet pages are to be handled and how. You configure the relevant filters for this purpose. A list of the filters already configured is shown (the example contains arbitrary values; the default configuration contains no filters). There are basically different approaches for configuring the filters:

- First a filter list can be created that only contains entries for those addresses that are to be blocked. In this case it is necessary to make an entry at the end of the filter list that allows all accesses that do not match a filter. (Setting for this: **CATEGORY** = *Default behaviour*, **ACTION** = *logging* or *allow*)
- If you only create entries for those addresses that are to be allowed or logged, it is not necessary to change the default behavior (= all other calls are blocked).

The filters are added or edited in the **SECURITY → COBION ORANGE FILTER → CONFIGURE FILTERS → ADD/EDIT** menu.

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH
[SECURITY] [ORANGE FILTER] [FILTER] [ADD]	MyGateway
<p>Category : Anonymous Proxies</p> <p>Day : Everyday</p> <p>From : [0 :0] To : [23:59]</p> <p>Action : block</p> <p>Priority : 0</p>	
SAVE	CANCEL

The menu consists of the following fields:

Field	Description
Category	<p>Here you select which category of addresses/URLs the filter is to be used on.</p> <p>The options are first the standard categories of the Cobion OrangeFilter (default value: <i>Anonymous Proxies</i>). Actions can also be defined for the following special cases:</p> <ul style="list-style-type: none"> ■ <i>Default behaviour</i>: This category applies to all Internet addresses. ■ <i>No valid license ticket</i>: If the Cobion OrangeFilter license is invalid, this category applies to all Internet addresses.

Field	Description
Category (cont.)	<ul style="list-style-type: none"> ■ <i>Orange Server not reachable</i>: If the Cobion OrangeFilter servers are not reachable, the action associated with this category is used. ■ <i>Other Category</i>: Some addresses are already known to the Cobion OrangeFilter, but not yet classified. The action associated with this category is used for such addresses. ■ <i>Unknown URL</i>: If an address is not known to the Cobion OrangeFilter, the action associated with this category is used.
Day	<p>Here you select the days on which the filter is to be active.</p> <p>Possible settings:</p> <ul style="list-style-type: none"> ■ <i>Everyday</i>: The filter is used every day of the week. ■ <i><Workday></i>: The filter is used on a certain day of the week. Only one day can be selected per filter; several filters must be configured if several individual days are to be covered. ■ <i>Monday-Friday</i>: The filter is used from Monday to Friday. <p>The default setting is <i>Everyday</i>.</p>
From	<p>Here you enter the time at which the filter is to be activated. The time is entered in the form <i>hh:mm</i>.</p> <p>The default setting is <i>0:0</i>.</p>

Field	Description
To	<p>Here you enter the time at which the filter is to be deactivated. The time is entered in the form <i>hh:mm</i>.</p> <p>The default setting is 23:59.</p>
Action	<p>Here you select the action to be executed if the filter matches a call.</p> <p>Possible settings:</p> <ul style="list-style-type: none"> ■ <i>block</i>: The call of the requested page is prevented. ■ <i>logging</i>: The call is permitted, but logged. The logged events can be viewed in the SECURITY → COBION ORANGE FILTER → VIEW HISTORY menu. ■ <i>allow</i>: The call is permitted, but not logged. <p>The default setting is <i>block</i>.</p>
Priority	<p>Here you assign the filter a priority. The filters are used in accordance with this priority.</p> <p>Possible values are between 0 and 999 and a value of 1 is the highest priority.</p> <p>The value 0 indicates an entry without priority, which is placed at the end of the filter list.</p> <p>The default value is 0.</p>

Table 2-2: **CONFIGURE FILTERS → ADD/EDIT** menu fields

2.4 View History Submenu

The **VIEW HISTORY** submenu is described below.

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH				
[SECURITY] [ORANGE FILTER] [HISTORY]: History List	MyGateway				
History List:					
Date	Time	Client	Url	Category	Action
11/12	16:09.52	192.168.0.1	www.xxx.de/	Pornography/Nudity	block
11/12	16:09.52	192.168.0.2	www.droge.de/	Drugs	block
EXIT					

You can view the recorded history of the content filter in the **SECURITY → COBION ORANGE FILTER → VIEW HISTORY** menu: The history logs all calls that are marked for logging by a relevant filter (**ACTION = logging**), likewise all rejected calls.

3 Access Lists Submenu

The **ACCESS LISTS** submenu is described below.

```

R4100 Setup Tool                               Funkwerk Enterprise Communications GmbH
[SECURITY][ACCESS]: IP Access Lists           MyGateway

Filter
Rules
Interfaces

EXIT

```

The **SECURITY** → **ACCESS LISTS** menu is for defining ►► **filters** for IP packets to allow or deny access to or from the various hosts in the connected networks. This enables you to prevent undesired connections being set up via the gateway.

Access lists define the type of IP traffic the gateway is to accept or deny. The access decision is based on information contained in the IP packets, e.g.:

- source and/or destination IP address
- packet protocol
- source and/or destination port (port ranges are supported)

Access lists are an effective means if, for example, sites with LANs interconnected over a Bintec gateway wish to deny all incoming FTP requests or only allow Telnet sessions between certain hosts.

IP filters (►► **access lists**) in the gateway are based on the combination of filters and actions for filter rules (= rules) and the linking of these rules to form rule chains. They act on the incoming data packets to allow or deny access to the gateway for certain data.

Filter A filter describes a certain part of the IP data traffic based on the source and/or destination IP address, **>>> netmask**, protocol, source and/or destination port.

Rule You use a rule to tell the gateway what to do with the filtered data packets, i.e. whether it should allow or deny them. You can also define several rules, which you arrange in the form of a chain to obtain a certain sequence.

Chain There are various approaches for the definition of rules and rule chains:

- Allow all packets that are not explicitly denied, i.e.:
 - Deny all packets that match Filter 1.
 - Deny all packets that match Filter 2.
 - ...
 - Allow the rest.
- Allow all packets that are explicitly allowed, i.e.:
 - Allow all packets that match Filter 1.
 - Allow all packets that match Filter 2.
 - ...
 - Deny the rest.
- Combination of the two possibilities described above.

A number of separate rule chains can be created. The same filter can also be used in different rule chains.

Interface

You can also assign a rule chain individually to each interface.



Attention!

Make sure you don't lock yourself out when configuring filters.

If possible, access your gateway for filter configuration over the serial console interface or ISDN Login.

If you still access your gateway over your LAN (e.g. with telnet over ETH1), before you start filter configuration select the menu *SECURITY* → *ACCESS LISTS* → *INTERFACES* → *EDIT* (e.g. for *en0-1*): First rule = *none*.

The ***ACCESS LISTS*** menu consists of the following submenus:

- ***FILTER***
- ***RULES***
- ***INTERFACES***

3.1 Filter Submenu

The **FILTER** submenu is described below.

R4100 Setup Tool		Funkwerk Enterprise Communications GmbH	
[SECURITY] [ACCESS] [FILTER]: Configure IP		MyGateway	
Access Filter			
Abbreviations: sa (source IP address) sp (source port)			
da (destination IP address) dp (destination port)			
it (icmp type) estab (TCP established)			
Index	Descr	Conditions	
1	ToNetbiosPorts	dp 137-139	
ADD		DELETE	
EXIT			

The **SECURITY → ACCESS LISTS → FILTER** menu is used for configuring filters. Each filter describes a certain part of the IP traffic and defines, for example, the IP addresses, the protocol, the source port or the destination port.

This menu lists all the IP access filters configured and shows the index number, description and conditions for every single filter. The abbreviations used in the Conditions column are explained in the field above the list.

The **ADD/EDIT** menu is used for configuration of the filters:

R4100 Setup Tool		Funkwerk Enterprise Communications GmbH	
[SECURITY] [ACCESS] [FILTER] [EDIT]		MyGateway	
Description			
Index	1		
Protocol	any		
Source Address			
Source Mask			
Destination Address			
Destination Mask			
Type of Service (TOS)	00000000	TOS Mask	00000000
	SAVE		CANCEL

It consists of the following fields:

Field	Description
Description	Designation of the filter. Note that only the first 10 or 15 characters are visible in other menus.
Index	Cannot be changed here. The gateway assigns a number to newly defined filters automatically.
Protocol	<p>Defines a protocol. Possible values:</p> <p><i>tcp/udp-port, any, tcp/udp-port, icmp, ggp, ip, tcp, egp, igp, pup, chaos, udp, hmp, xns_idp, rdp, rsvp, gre, esp, ah, tlsp, skip, kryptolan, iso-ip, igrp, ospf, ipip, ipx-in-ip, vrrp, l2tp.</i></p> <p><i>any</i> matches any protocol.</p> <p>The default value is <i>any</i>.</p>

Field	Description
Type	<p>Only if PROTOCOL = <i>icmp</i>. Possible values: <i>any, echo reply, destination unreachable, source quench, redirect, echo, time exceeded, param problem, timestamp, timestamp reply, address mask, address mask reply.</i></p> <p>The default value is <i>any</i>. See RFC 792.</p>
Connection State	<p>If PROTOCOL = <i>tcp</i>, you can define a filter based on the status of the TCP connection. Possible values:</p> <ul style="list-style-type: none"> ■ <i>established</i>: All TCP packets that would not open any new TCP connection on routing over the gateway match the filter. ■ <i>any (default value)</i>: All TCP packets match the filter.
Source Address	Defines the source IP address of the data packets.
Source Mask	Netmask for SOURCE ADDRESS .
Source Port	<p>Only for PROTOCOL = <i>tcp/udp-port, tcp, udp</i> Source port number or range of source port numbers.</p> <p>For possible values see table “Selection options of Source Port and Destination Port,” on page 20.</p> <p>The default value is <i>any</i>.</p>
Specify Port .. to Port	If SOURCE PORT or DESTINATION PORT = <i>specify</i> or <i>specify range</i> : Port numbers or range of port numbers.
Destination Address	Defines the destination IP address of the data packets.
Destination Mask	Netmask for DESTINATION ADDRESS

Field	Description
Destination Port	Only for PROTOCOL = <i>tcp/udp-port, tcp, udp</i> Destination port number or range of destination port numbers that matches the filter. For possible values see table “Selection options of Source Port and Destination Port,” on page 20. The default value is <i>any</i> .
Type of Service <TOS>	Identifies the priority of the IP packet, cf. RFC 1349 and RFC 1812 (enter in binary format).
TOS Mask	Bitmask for Type of Service (enter in binary format).

Table 3-1: **FILTER** menu fields

The **SOURCE PORT** and **DESTINATION PORT** contain the following selection options:

Description	Meaning
any (default value)	The route is valid for all >> port numbers.
specify	Enables the entry of a port number.
specify range	Enables the entry of a range of port numbers.
priv (0...1023)	Privileged port numbers: 0 ... 1023.
server (5000....32767)	Server port numbers: 5000 ... 32767.
clients 1 (1024....4999)	Client port numbers: 1024 ... 4999.
clients 2 (32768....65535)	Client port numbers: 32768 ... 65535.
unpriv (1024...65535)	Unprivileged port numbers: 1024 ... 65535.

Table 3-2: Selection options of **SOURCE PORT** and **DESTINATION PORT**

3.2 Rules Submenu

The **RULES** submenu is described below.

R4100 Setup Tool		Funkwerk Enterprise Communications GmbH			
[SECURITY] [ACCESS] [RULE]:		Configure IP Access Rules		MyGateway	
Abbreviations:					
	RI		(Rule Index)	M	(Action if filter matches)
	FI		(Filter Index)	!M	(Action if filter does not match)
		NRI	(Next Rule Index)		
RI	FI	NRI	Action	Filter	Conditions
1	1	0	deny M	ToNetbiosP	sp 137-139
ADD		DELETE		REORG EXIT	

Rules for IP filters are configured in the **IP → ACCESS LISTS → RULES** menu. These can be created separately or incorporated in rule chains.

All the filter rules configured are listed in **IP → ACCESS LISTS → RULES**. **RF**, **FI**, **NRI**, **ACTION**, **FILTER** (only the first ten characters are shown) and **CONDITIONS** are listed. The meaning of the abbreviations is shown in the top part of the Setup Tool window.

New rules are added or existing rules edited in the **RULES → ADD/EDIT** menu.

R4100 Setup Tool		Funkwerk Enterprise Communications GmbH			
[SECURITY] [ACCESS] [RULE] [EDIT]		MyGateway			
Action		deny	M		
Filter		ToNetbiosPorts			
SAVE			CANCEL		

The **RULES** → **ADD/EDIT** menu consists of the following fields:

Field	Description
Index	Appears only for EDIT . Cannot be changed. Shows the INDEX of existing rules. The gateway assigns a number to newly defined rules automatically.
Insert behind Rule	Appears only for ADD and if at least one rule exists. Defines the existing rule behind which the new rule is inserted. You can start a new independent chain with <i>none</i> .
Action	Defines the action to be taken for a filtered data packet. <ul style="list-style-type: none"> ■ <i>allow M</i> (default value): Allow packet if it matches the filter. ■ <i>allow !M</i>: Allow packet if it does not match the filter. ■ <i>deny M</i>: Deny packet if it matches the filter. ■ <i>deny !M</i>: Deny packet if it does not match the filter. ■ <i>ignore</i>: Use next rule.
Filter	Defines which filter is used.
Next Rule	Appears only if an existing rule is edited. Defines the next rule to be used.

Table 3-3: **RULES** menu fields

You can reorganize the indexing of the rules in the **ACCESS LIST** → **RULES** → **REORG** menu; the sequence of the configured rules is retained. The rule that is to receive rule **INDEX 1** is defined in the **INDEX OF RULE THAT GETS INDEX 1** field.


```

R4100 Setup Tool                               Funkwerk Enterprise Communications GmbH
[SECURITY] [ACCESS] [RULE] [REORG]: Reorganize Rules           MyGateway

Index of Rule that gets Index 1      none

REORG                                CANCEL

```

The rule chain that starts with rule **INDEX 1** is always applied as standard to the interface of the gateway (e.g. WAN partner).

3.3 Interfaces Submenu

The **INTERFACES** submenu is described below.

```

R4100 Setup Tool                               Funkwerk Enterprise Communications GmbH
[SECURITY] [ACCESS] [INTERFACES]: Configure First Rules       MyGateway

Configure first rules for interfaces

Interface      First Rule      First Filter
en1-0          1 (no access rules)
en1-0-snap     1 (no access rules)
en1-4          1 (no access rules)
en1-4-snap     1 (no access rules)

EXIT

```

The **IP → ACCESS LISTS → INTERFACES** menu lists all the gateway's interfaces and shows the assignment of rule chains to the interfaces.

The assignment is configured in the **IP → ACCESS LISTS → INTERFACES → EDIT** menu.

R4100 Setup Tool		Funkwerk Enterprise Communications GmbH	
[SECURITY] [ACCESS] [INTERFACES] [EDIT]		MyGateway	
Interface	en1-0		
First Rule	RI 1	FI 1	(to-netbios-ports)
Deny Silent	yes		
Reporting Method	info		
SAVE		CANCEL	

Here the configured rule chains are assigned to the individual interfaces and the gateway's behavior is defined for denying IP packets.

The **EDIT** submenu contains the following fields:

Field	Description
Interface	Name of interface that has been selected. This field cannot be edited.
First Rule	Defines the start of the rule chain to be applied to data packets received over INTERFACE . If you enter <i>none</i> (default value), you specify that no filters are used for INTERFACE .
Deny Silent	Defines whether the sender is to be informed if an IP packet is denied. Possible values: <ul style="list-style-type: none"> ■ <i>no</i>: The sender receives an ICMP message. ■ <i>yes</i> (default value): The sender is not informed.

Field	Description
Reporting Method	<p>Defines whether a syslog message is to be generated if a packet is denied. Possible values:</p> <ul style="list-style-type: none">■ <i>none</i>: No syslog message.■ <i>info</i> (default value): A syslog message is generated with the protocol number, source IP address and source port number.■ <i>dump</i>: A syslog message is generated with the contents of the first 64 bytes of the denied packet.

Table 3-4: **INTERFACES** submenu fields

4 Stateful Inspection Submenu

The *STATEFUL INSPECTION* submenu is described below.

The Stateful Inspection Firewall (SIF) provided for bintec gateways is a powerful security feature.

The SIF with dynamic packet filtering has a decisive advantage over static packet filtering (see [“Access Lists Submenu” on page 15](#)): The decision whether or not to send a packet cannot be made solely on the basis of source and destination addresses or **ports**, but also using dynamic packet filtering based on the state of the connection to a partner.

This means packets that belong to an already active connection can also be forwarded. The SIF also accepts packets that belong to an "affiliated connection". Example: The negotiation of an **FTP** connection takes place over port 21, but the actual data exchange can take place over a completely different port.

SIF and other security features

Bintec's Stateful Inspection Firewall fits into the existing security architecture of Bintec gateways very well due to its simple configuration. The configuration effort for the SIF is very easy compared with systems like Network Address Translation (**NAT**) and **IP Access Lists** (IPAL).

As SIF, NAT and IPAL are active in the system simultaneously, attention must be given to possible interaction: If any packet is discarded by one of the security instances, this takes place immediately. This means it is irrelevant if this packet would be allowed by another instance. Your requirement for security features should therefore be accurately analyzed.

The essential difference between SIF and NAT/IPAL is that the rules for the SIF are generally applied globally, i.e. not restricted to one interface.

In principle, the same filter criteria are applied to the data traffic as are used in NAT and IPAL:

- Source and destination address of the packet (with an associated netmask)
- Service (preconfigured, e.g. Echo, FTP, HTTP)
- Protocol
- Port number(s)

To illustrate the differences in packet filtering, a list of the individual security instances and their method of operation is given below:

NAT One of the basic functions of NAT is the translation of the local IP addresses of your LAN into the global IP addresses you are assigned by your >> **ISP** and vice versa. All connections initiated externally are first blocked, i.e. every packet the gateway cannot assign to an existing connection is discarded. This means that a connection can only be set up from inside to outside. Without explicit permissions, NAT rejects every access from the >> **WAN** to the LAN.

IP Access Lists Here packets are allowed or discarded exclusively on the basis of the criteria listed above, i.e. the state of the connection is not considered (except for **PROTOCOL = tcp**).

SIF The SIF sorts out all packets that are not explicitly or implicitly allowed. The result can be a "deny", in which case no error message is sent to the sender of the discarded packet, or a "reject", where the sender is informed of the rejection of the packet.

Incoming packets are processed as follows:

- The SIF first checks if an incoming packet can be assigned to an existing connection. If so, it is forwarded. If the packet cannot be assigned to an existing connection, a check is made to see if a suitable connection is expected (e.g. as affiliated connection of an existing connection). If so, the packet is also accepted.
- If the packet cannot be assigned to any existing or expected connection, the SIF filter rules are applied: If a deny rule matches the packet, the packet is discarded without sending an error message to the sender of the packet; if a reject rule matches, the packet is discarded and an >> **ICMP** Host Unreachable message sent to the sender of the packet. The packet is only forwarded if an accept rule matches.
- All packets without matching rules are discarded without sending an error message to the sender once all the existing rules have been checked (=default behavior).

The menus in which you configure the SIF are described below.

The **SECURITY** → **STATEFUL INSPECTION** menu shows global parameters and leads to submenus:

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH
[SECURITY][STATEFUL INSPECTION]: Static settings	MyGateway
Stateful Inspection Firewall global settings:	
Adminstatus : enable Local Filter : disable Full Filtering : enable Logging level : all	
Edit Filters > Edit Services > Edit Addresses >	
Edit Service Groups > Edit Interface Groups > Edit Address Groups >	
Advanced Settings >	
SAVE	CANCEL

The **STATEFUL INSPECTION** menu consists of the following fields:

Field	Description
Adminstatus	<p>Here you can basically activate and deactivate the feature.</p> <p>Possible settings:</p> <ul style="list-style-type: none"> ■ <i>enable</i>: Default value ■ <i>disable</i>
Local Filter	<p>Here you define whether locally initiated connections are also to be filtered by the SIF.</p> <p>Possible settings:</p> <ul style="list-style-type: none"> ■ <i>enable</i>: Locally generated requests are also filtered. ■ <i>disable</i>: Locally generated requests are generally allowed (default value).

Field	Description
Full Filtering	<p>Here you define whether packets are only to be filtered if they are sent to an interface other than the interface that created the connection.</p> <p>Possible settings:</p> <ul style="list-style-type: none"> ■ <i>enable</i>: All packets are filtered (default value). ■ <i>disable</i>: Packets are only filtered if their destination interface differs from the output interface of the connection.
Logging level	<p>Here you can select the SIF syslog level. The messages are output together with the messages of the other subsystems, see manual Monitoring and Debugging, Messages chapter).</p> <p>Possible settings:</p> <ul style="list-style-type: none"> ■ <i>all</i>: All SIF activities are shown (default value). ■ <i>deny only</i>: Only reject and deny events are shown, cf. “Action” on page 35. ■ <i>accept only</i>: Only accept events are shown. ■ <i>none</i>: Syslog messages are not generated.

Table 4-1: **STATEFUL INSPECTION** menu fields

Access for configuration of the filters (**EDIT FILTERS**), services (**EDIT SERVICES**) and filter addresses (**EDIT ADDRESSES**) is via the **SECURITY → STATEFUL INSPECTION** menu. This menu also provides access to the **ADVANCED SETTINGS** menu.

4.1 Edit Filters Submenu

The **EDIT FILTERS** submenu is described below.

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH		
[SECURITY] [STATEFUL INSPECTION] [FILTERS]: Configuration	MyGateway		
Stateful Inspection Filter List:			
Press 'u' to move Filter up or press 'd' to move Filter down.			
Pos.	Source	Destination	Service
			Action
ADD	DELETE	SAVE	CANCEL

The configured SIF filter rules are listed in the **SECURITY → STATEFUL INSPECTION → EDIT FILTERS** menu.

The default behavior with **ACTION allow** consists of two implicit filter rules: If an incoming packet can be assigned to an existing connection and if a suitable connection is expected (e.g. as affiliated connection of an existing connection), the packet is allowed.

The sequence of filter rules in the list is relevant: The filter rules are applied to each packet in succession until a rule matches. If overlapping occurs, i.e. more than one filter rule matches a packet, only the first rule is executed. This means that if the first rule denies a packet, whereas a later rule allows it, the packet is discarded. A deny rule also has no effect if a relevant packet has previously been allowed by another filter rule.

You can add a filter rule for the SIF or edit an existing rule in the **SECURITY → STATEFUL INSPECTION → EDIT FILTERS → ADD/EDIT** menu.

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH
[SECURITY] [STATEFUL INSPECTION] [ADD]	MyGateway
Source	<-- Addresses select Addresses -->
Destination	<-- Addresses select Addresses -->
Edit Addresses >	
Service	<-- Services select Services -->
Edit Services >	
Action	accept
QoS Priority	default (no special IP QoS handling)
SAVE	CANCEL

The **EDIT FILTERS** → **ADD/EDIT** menu consists of the following fields:

Field	Description
Source	<p>Here you can select one of the preconfigured aliases for the source of the packet. The gateway reads the list of existing WAN and LAN interfaces and the interface groups configured in EDIT INTERFACE GROUPS and the address groups configured in EDIT ADDRESS GROUPS and offers these as default setting. The default value is <-- Addresses select Addresses -->.</p> <p>You can create a new alias in SECURITY → STATEFUL INSPECTION → EDIT FILTERS → ADD/EDIT → EDIT ADDRESSES → ADD/EDIT see “Edit Addresses Submenu” on page 37</p> <p>You can create interface groups in SECURITY → STATEFUL INSPECTION → EDIT INTERFACE GROUPS → ADD/EDIT see “Edit Interface Groups Submenu” on page 40</p> <p>You can create address groups in SECURITY → STATEFUL INSPECTION → EDIT ADDRESS GROUPS → ADD/EDIT see “Edit Address Groups Submenu” on page 41</p>

Field	Description
Destination	<p>Here you can select one of the preconfigured aliases for the destination of the packet. The gateway reads the list of existing WAN and LAN interfaces and the interface groups configured in EDIT INTERFACE GROUPS and the address groups configured in EDIT ADDRESS GROUPS and offers these as default setting. The default value is <-- <i>Addresses select Addresses</i> -->.</p> <p>You can create a new alias in SECURITY → STATEFUL INSPECTION → EDIT FILTERS → ADD/EDIT → EDIT ADDRESSES → ADD/EDIT see “Edit Addresses Submenu” on page 37</p> <p>You can create interface groups in SECURITY → STATEFUL INSPECTION → EDIT INTERFACE GROUPS → ADD/EDIT see “Edit Interface Groups Submenu” on page 40</p> <p>You can create address groups in SECURITY → STATEFUL INSPECTION → EDIT ADDRESS GROUPS → ADD/EDIT see “Edit Address Groups Submenu” on page 41</p>

Field	Description
Service	<p>Here you can select one of the preconfigured services, to which the packet to be filtered must be assigned. <-- <i>Services select Services</i> --> is displayed as per default.</p> <p>The extensive range of services configured ex works includes the following:</p> <ul style="list-style-type: none"> ■ <i>ftp</i> ■ <i>telnet</i> ■ <i>smtp</i> ■ <i>dns</i> ■ <i>http</i> ■ <i>nntp</i> ■ <i>internet</i> ■ <i>netmeeting</i> <p>You can configure other services in the SECURITY → STATEFUL INSPECTION → EDIT FILTERS → ADD/EDIT → EDIT SERVICES menu see “Edit Services Submenu” on page 36</p> <p>You can configure service groups in the SECURITY → STATEFUL INSPECTION → EDIT SERVICE GROUPS → ADD/EDIT menu see “Edit Service Groups Submenu” on page 39</p>

Field	Description
Action	<p>Here you select the action to be applied to a filtered packet. Possible values are:</p> <ul style="list-style-type: none"> ■ <i>accept</i> (default value) ■ <i>deny</i> ■ <i>reject</i> <p>The packet is denied for both <i>reject</i> and <i>deny</i>, but in the case of <i>deny</i> without sending an error message to the sender of the packet.</p>
QoS Priority	<p>Only for ACTION = <i>accept</i></p> <p>Select the priority with which the sent data specified by this filter is handled.</p> <p>Possible values:</p> <ul style="list-style-type: none"> ■ <i>default (no special IP QoS handling)</i> (Defaultwert): No priority. ■ <i>low latency (highest priority)</i>: Low Latency Transmission (LTT), i.e. handling the data with the lowest possible latency, e.g. for VoIP data. ■ <i>high</i>: High priority. ■ <i>medium</i>: Medium priority. ■ <i>low</i>: Low priority.
Class ID	<p>Only for QoS PRIORITY = <i>high, medium, low</i>.</p> <p>Defines the QoS packet class.</p> <p>Possible values: 1 (default value) to 255.</p>

Table 4-2: **EDIT FILTERS** menu fields

4.2 Edit Services Submenu

The **EDIT SERVICES** submenu is described below.

The **SECURITY → STATEFUL INSPECTION → EDIT SERVICES** menu shows a list of over 60 preconfigured service aliases.

Select **ADD** or an existing entry to access the **SECURITY → STATEFUL INSPECTION → EDIT SERVICES → ADD/EDIT** menu, in which you can define another service alias or edit an existing alias. You can also access this menu via **SECURITY → STATEFUL INSPECTION → EDIT FILTERS → ADD → EDIT SERVICES → ADD/EDIT**.

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH
[SECURITY] [STATEFUL INSPECTION] [SERVICES] [ADD]	MyGateway
Alias	
Protocol	ah
SAVE	CANCEL

The **EDIT SERVICES → ADD/EDIT** menu consists of the following fields:

Field	Description
Alias	Here you enter an alias for the service you want to configure.
Protocol	Here you select the protocol on which the service is based. The most important protocols are available for selection. (The default value for ADD is <i>ah</i> .)
ICMP Type	Only if you have set PROTOCOL to <i>icmp</i> . This field is set to <i>echo</i> per default. This setting covers the so-called pings. The value cannot be changed.

Field	Description
Port	Only if you have set PROTOCOL to <i>tcp, udp/tcp</i> or <i>udp</i> . Here you enter the port over which the service runs. Possible values are 1 to 65535. The default value is 1.
Range	Only if you have set PROTOCOL to <i>tcp, udp/tcp</i> or <i>udp</i> . Here you enter how many consecutive ports the service uses, incl. the value set in PORT . Possible values are 1 to 65535. If you do not enter a value, the gateway assumes the value 1 as default.

Table 4-3: **EDIT SERVICES** menu fields

4.3 Edit Addresses Submenu

The **EDIT ADDRESSES** submenu is described below.

All the configured aliases are listed in the **SECURITY → STATEFUL INSPECTION → EDIT ADDRESSES** menu. The list contains the interfaces configured for the gateway. Select **ADD** or an existing entry to access the **SECURITY → STATEFUL INSPECTION → EDIT ADDRESSES → ADD/EDIT** menu, in which you can create other address aliases or edit existing aliases. You can also access this menu via **SECURITY → STATEFUL INSPECTION → EDIT FILTERS → ADD → EDIT ADDRESSES → ADD/EDIT**.

R4100 Setup Tool		Funkwerk Enterprise Communications GmbH	
[SECURITY] [STATEFUL INSPECTION] [ADDRESSES] [ADD]		MyGateway	
Alias			
Mode		interface	
Interface		en0-1	
SAVE			CANCEL

The **EDIT ADDRESSES** → **ADD/EDIT** menu consists of the following fields:

Field	Description
Alias	Here you enter the alias name you want to configure.
Mode	Here you indicate whether you want to designate an IP address (<i>Address/Range</i> or <i>Address/Subnet</i>) or an interface (<i>interface</i>) with the alias. Possible values: <ul style="list-style-type: none"> ■ <i>interface</i> (default value) ■ <i>Address/Range</i> ■ <i>Address/Subnet</i>.
IP Address	Only if you have set MODE to <i>Address/Range</i> or <i>Address/Subnet</i> . Here you enter the IP address to which the alias is to apply.
IP Range	Only for MODE = <i>Address/Range</i> Here you enter the number of consecutive IP addresses incl. the address entered in IP ADDRESS .

Field	Description
IP Mask	Only if you have set MODE to <i>Address/Subnet</i> . Here you enter the netmask belonging to the IP address of the host. The default value is 255.255.255.255.
Interface	Only if you have set MODE to <i>interface</i> . Here you select the interface via which packets are to be received and sent. You can select from all configured WAN partners and LAN interfaces.

Table 4-4: **EDIT ADDRESSES** menu fields

4.4 Edit Service Groups Submenu

The **EDIT SERVICE GROUPS** submenu is described below.

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH
[SECURITY] [STATEFUL INSPECTION] [SERVICE GROUPS] [ADD]	MyGateway
Alias	
Configure the Service Group Members	
Service Alias 1	
Service Alias 2	
Service Alias 3	
Service Alias 4	
Service Alias 5	
Service Alias 6	
Service Alias 7	
Service Alias 8	
Service Alias 9	
Service Alias 10	
SAVE	CANCEL

In the **SECURITY → STATEFUL INSPECTION → EDIT SERVICE GROUPS** menu services can be pooled into groups.

The **EDIT SERVICE GROUPS** menu consists of the following fields:

Field	Value
Alias	Here you enter the alias name for the service group.
Service Alias 1 - 10	Here you select the alias names of the services that are to belong to the group.

Table 4-5: Fields of the **EDIT SERVICE GROUPS** menu

4.5 Edit Interface Groups Submenu

The **EDIT INTERFACE GROUPS** submenu is described below.

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH
[SECURITY] [STATEFUL INSPECTION] [INTERFACE GROUPS] [ADD]	MyGateway
Alias	
Configure the Interface Group Members	
Interface Alias 1	
Interface Alias 2	
Interface Alias 3	
Interface Alias 4	
Interface Alias 5	
Interface Alias 6	
Interface Alias 7	
Interface Alias 8	
Interface Alias 9	
Interface Alias 10	
SAVE	CANCEL

In the **SECURITY → STATEFUL INSPECTION → EDIT INTERFACE GROUPS** menu interfaces can be pooled into groups.

The **EDIT INTERFACE GROUPS** menu consists of the following fields:

Field	Value
Alias	Here you enter the alias name for the service group.
Interface Alias 1	Here you select the alias names of the interfaces that are to belong to the group.

Table 4-6: Fields of the **EDIT INTERFACES GROUPS** menu

4.6 Edit Address Groups Submenu

The **EDIT ADDRESS GROUPS** submenu is described below.

Setup Tool	Funkwerk Enterprise Communications GmbH
[SECURITY] [STATEFUL INSPECTION] [ADDRESS GROUPS] [ADD]	MyGateway
Alias	
Configure the Address Group Members	
Address Alias 1	
Address Alias 2	
Address Alias 3	
Address Alias 4	
Address Alias 5	
Address Alias 6	
Address Alias 7	
Address Alias 8	
Address Alias 9	
Address Alias 10	
SAVE	CANCEL

In the **SECURITY → STATEFUL INSPECTION → EDIT ADDRESS GROUPS** menu services can be pooled into groups.

The **EDIT ADDRESS GROUPS** menu consists of the following fields:

Field	Value
Alias	Here you enter the alias name for the service group.
Address Alias 1 - 10	Here you select the alias names of the addresses that are to belong to the group.

Table 4-7: Fields of the **EDIT ADDRESS GROUPS** menu

4.7 Advanced Settings Submenu

The **ADVANCED SETTINGS** submenu is described below.

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH
[SECURITY] [STATEFUL INSPECTION] [ADVANCED]: Settings	MyGateway
Stateful Inspection session expiration:	
UDP inactivity Timeout : 180 TCP inactivity Timeout : 3600 PPTP inactivity Timeout : 86400 Other inactivity Timeout : 30	
SAVE	CANCEL

Settings for the session timeout are made in the **SECURITY → STATEFUL INSPECTION → ADVANCED SETTINGS** menu.

The **ADVANCED SETTINGS** menu consists of the following fields:

Field	Description
UDP inactivity Timeout	Here you can enter the inactivity time, after which a UDP session is regarded as expired (in seconds). Possible values are 30 to 86400. The default value is 180.
TCP inactivity Timeout	Here you can enter the inactivity time, after which a TCP session is regarded as expired (in seconds). Possible values are 30 to 86400. The default value is 3600.
PPTP inactivity Timeout	Here you can enter the inactivity time, after which a PPTP session is regarded as expired (in seconds). Possible values are 30 to 86400. The default value is 86400.
Other inactivity Timeout	Here you can enter the inactivity time, after which a session of another type is regarded as expired (in seconds). Possible values are 30 to 86400. The default value is 30.

Table 4-8: **ADVANCED SETTINGS** menu fields

5 SSH Daemon Submenu

The **SSH DAEMON** submenu is described below.

```

R4100 Setup Tool                               Funkwerk Enterprise Communications GmbH
[SECURITY][SSHD]: SSH Daemon Configuration      MyGateway

SSH Daemon                                     running

Static Settings >
Timer >

Authentication Algorithms >
Supported Ciphers >
Message Authentication Codes >

Certification Management >

Monitoring >

SAVE                                           EXIT

```

Your gateway offers encrypted access to the shell (see manual chapter **Access and Configuration**). You can activate (*running*, default value) or deactivate (*stopped*) this access in the **SECURITY → SSH DAEMON** menu and have access to the menus for configuration of the SSH Login.

You need an SSH client application, e.g. PuTTY, to be able to reach the SSH Daemon.

If you wish to use SSH Login together with the PuTTY client, you must comply with some special configuration requirements, for which we have prepared FAQs. You will find these in the Service/Support section at www.funkwerk-ec.com.

To be able to reach the shell of your gateway via an SSH client, make sure the settings for the SSH Daemon and SSH client are the same.



Note

After configuration you should check that the SSH Daemon has started: Enter `ps -e` in the shell and verify that `sshd` is executed.

If not, you must restart the gateway to start the SSH Daemon.

5.1 Static Settings Submenu

The **STATIC SETTINGS** submenu is described below.

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH
[SECURITY] [SSHD] [STATIC]: SSHD Static Options	MyGateway
Max. # of Clients	1
Port # used for Connections	22
Compression	disabled
Verify Reverse Mapping	disabled
Print Motd	enabled
Print LastLog	disabled
Logging Level	info
SAVE	CANCEL

The **SECURITY → SSH DAEMON → STATIC SETTINGS** menu is for selecting the basic parameters of the SSH Daemon.

The **STATIC SETTINGS** menu consists of the following fields:

Field	Description
Max. # of Clients	Here you enter how many simultaneous connections are allowed to the SSH Daemon. Any connections above this number are rejected until a connection is cleared. This field cannot be edited, as only a single SSH connection is possible.
Port # used for Connections	Here you enter the port at which a client can connect to the SSH Daemon. Possible values are 1 to 65535. The default value is 22.

Field	Description
Compression	<p>Here you can activate (<i>enabled</i>) or deactivate (<i>disabled</i>) the use of data compression.</p> <p>The default value is <i>disabled</i>.</p>
Verify Reverse Mapping	<p>Here you select whether the SSH Daemon executes a reverse lookup of the client IP address. This verifies that the host name belonging to the IP address is correct, i.e. the IP address is not a fake. The connection is cleared if the IP address is a fake.</p> <p>Possible settings:</p> <ul style="list-style-type: none"> ■ <i>disabled</i> (default value) ■ <i>enabled</i>.
Print Motd	<p>Here you select whether the SSH Daemon sends a Message of the Day (MotD) as soon as a client has logged in.</p> <p>Possible settings:</p> <ul style="list-style-type: none"> ■ <i>disabled</i> ■ <i>enabled</i> (default value).
Print LastLog	<p>Here you select whether the SSH Daemon prints the date and time of the last login when a client logs in.</p> <p>Possible settings:</p> <ul style="list-style-type: none"> ■ <i>disabled</i> (default value) ■ <i>enabled</i>.

Field	Description
Logging Level	<p>Here you can select the syslog level for the syslog messages generated by the SSH Daemon.</p> <p>Possible settings:</p> <ul style="list-style-type: none"> ■ <i>quiet</i>: No messages are recorded. ■ <i>fatal</i>: Only fatal errors of the SSH Daemon are recorded. ■ <i>error</i>: Fatal and simple errors of the SSH Daemon are recorded. ■ <i>info</i> (default value): Fatal and simple errors of the SSH Daemon and information messages are recorded. ■ <i>debug</i>: All messages are recorded.

Table 5-1: **STATIC SETTINGS** menu fields

5.2 Timer Submenu

The **TIMER** submenu is described below.

R4100 Setup Tool		Funkwerk Enterprise Communications GmbH	
[SECURITY] [SSHD] [TIMER]: SSHD Timer Options		MyGateway	
Login Grace Time	600		
TCP Keepalives	enabled		
ClientAliveCountMax	3		
ClientAliveInterval	10		
		SAVE	CANCEL

You can configure the timing behavior of the SSH Daemon in the **SECURITY → SSH DAEMON → TIMER** menu.

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

Field	Description
Login Grace Time	<p>Here you enter the time interval within which a client must authenticate before the SSH connection is cleared.</p> <p>Possible values are 0 to 3600 (seconds). A value of 0 means no limit and the default value is 600.</p>
TCP Keepalives	<p>Here you select whether the gateway is to send keepalive packets.</p> <p>Possible settings:</p> <ul style="list-style-type: none"> <input type="checkbox"/> <i>disabled</i> <input checked="" type="checkbox"/> <i>enabled</i>: Default value. <p>The same value should be configured for both client and server.</p>
ClientAliveCountMax	<p>This field is only to be configured if TCP KEEPALIVES = enabled.</p> <p>Here you enter the number of keepalive packets sent by the gateway that may remain unanswered before the SSH Daemon clears the connection.</p> <p>Possible values are 0 to 10 and the default value is 3.</p>

Field	Description
ClientAliveInterval	<p>This field is only to be configured if TCP KEEPALIVES = enabled.</p> <p>Here you enter the interval after which the SSH Daemon sends a Keepalive Request to the client if no more data is received from the client.</p> <p>Possible values are 1 to 3600 (seconds) and the default value is 10.</p>

Table 5-2: *TIMER* menu fields

5.3 Authentication Algorithms Submenu

The **AUTHENTICATION ALGORITHMS** submenu is described below.

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH
[SECURITY] [SSHD] [AUTH]: SSHD Authentication Options	MyGateway
Protocol Version	2
Public Key	enabled
Password	enabled
Challenge Response	enabled
SAVE	CANCEL

The **SECURITY → SSH DAEMON → AUTHENTICATION ALGORITHMS** menu is for configuring the authentication mechanisms for SSH connection setup.

The **AUTHENTICATION ALGORITHMS** menu consists of the following fields:

Field	Description
Protocol Version	This shows which SSH version the SSH Daemon uses. This field cannot be edited, as only version 2 is currently supported.
Public Key	Here you select whether or not public key authentication of the client is allowed. Possible settings: <input type="checkbox"/> <i>disabled</i> <input checked="" type="checkbox"/> <i>enabled</i> : Default value. This feature is not available at present.
Password	Here you select whether or not password authentication of the client is allowed. (Logging in via the SSH client is only possible as <i>admin</i> user with the associated password.) Possible settings: <input type="checkbox"/> <i>disabled</i> <input checked="" type="checkbox"/> <i>enabled</i> : Default value.
Challenge Response	Here you select whether or not challenge response authentication of the client is allowed. Possible settings: <input type="checkbox"/> <i>disabled</i> <input checked="" type="checkbox"/> <i>enabled</i> : Default value. This feature is not available at present.

Table 5-3: **AUTHENTICATION ALGORITHMS** menu fields

5.4 Supported Ciphers Submenu

The **SUPPORTED CIPHERS** submenu is described below.

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH
[SECURITY] [SSHD] [AUTH]: SSHD Cipher Options	MyGateway
aes128	enabled
3des	enabled
blowfish	enabled
cast128	enabled
arc4	enabled
aes192	disabled
aes256	disabled
SAVE	CANCEL

The **SECURITY** → **SSH DAEMON** → **SUPPORTED CIPHERS** menu is used for defining the algorithms that may be used for encryption of the SSH connection.

Possible algorithms:

- **AES128**
- **3DES**
- **BLOWFISH**
- **CAST128**
- **ARC4**
- **AES192**
- **AES256**

For each of the algorithms listed in the menu you can select from *enabled* (default value for **AES128**, **3DES**, **BLOWFISH**, **CAST128**, **ARC4**) and *disabled* (default value for **AES192**, **AES256**).

5.5 Message Authentication Codes Submenu

The **MESSAGE AUTHENTICATION CODES** submenu is described below.

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH
[SECURITY] [SSHD] [MACS]: SSHD Message Authentication Codes	MyGateway
md5	enabled
sha1	enabled
ripemd160	enabled
sha1-96	enabled
md5-96	disabled
SAVE	CANCEL

In the **SECURITY → SSH DAEMON → MESSAGE AUTHENTICATION CODES** menu you can define the algorithms that are available for message authentication of the SSH connection.

Possible message hash algorithms:

- **MD5**
- **SHA1**
- **RIPEMD160**
- **SHA1-96**
- **MD5-96**

For each of the algorithms listed in the menu you can select from *enabled* (default value for **MD5**, **SHA1**, **RIPEMD160**, **SHA1-96**) and *disabled* (default value for **MD5-96**).

5.6 Certification Management Submenu

The **CERTIFICATION MANAGEMENT** submenu is described below.

```

R4100 Setup Tool                    Funkwerk Enterprise Communications GmbH
[SECURITY] [SSHD] [KEYS]: SSHD Certification Management      MyGateway

CAUTION: Key generation may take some minutes
          depending on your router's CPU speed

          Generate DSA Key
          Generate RSA Key

EXIT

```

In the **SECURITY → SSH DAEMON → CERTIFICATION MANAGEMENT** menu you can create the keys necessary for authentication (cf. “[Public Key](#)” on page 51). You can select a **▶▶ DSA** key and an **▶▶ RSA** key. We recommend you create both keys. The keys are saved internally in the system.

Creating the keys takes several minutes and cannot be aborted.

5.7 Monitoring Submenu

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	
[SECURITY] [SSHD] [SESSIONS]: 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	
[SECURITY] [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.

Field	Value
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 5-4: Fields of the **SSH DAEMON** → **MONITORING** → **EDIT** menu

6 Local Services Access Control Submenu

The **LOCAL SERVICES ACCESS CONTROL** submenu is described below.

The access to the local **UDP** and **TCP** services on the gateway (e.g. Telnet, **CAPI**, trace) is controlled in the **SECURITY → LOCAL SERVICES ACCESS CONTROL** menu.

The menu displays a list with all local services for which rules have been defined.

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH		
[SECURITY] [LOCALSRV]: Local Services Access Control	MyGateway		
Services for which no entry exists are NOT access restricted			
Service	Source-Addr	Source-Mask	Interface
telnet(tcp)	192.168.1.1	255.255.255.0	don't verify
http(tcp)	192.168.1.2	255.255.255.0	don't verify
ADD	DELETE	EXIT	

If no entry exists for a service, there are no access restrictions for this service, if no other security features have been configured.

If the list contains rules for a service, access to it is only allowed for the IP address resp. interface defined.

An entry with **VERIFY IP ADDRESS = don't verify** und **VERIFY INTERFACE = don't verify** means, that no restrictions exist for this service.

For each local service rules for its usage can be defined in the **LOCAL SERVICES ACCESS CONTROL → ADD/EDIT** menu.

R4100 Setup Tool	Funkwerk Enterprise Communications GmbH
[SECURITY] [LOCALSRV] [ADD]	MyGateway
Service	snmp(udp)
Verify IP Address	don't verify
Verify Interface	don't verify
SAVE	CANCEL

The menu consists of the following fields:

Field	Description
Service	<p>Defines the local service on the gateway, to which access is to be controlled with this entry. Possible values:</p> <ul style="list-style-type: none"> ■ <i>snmp(udp)</i> (default value) ■ <i>rip(udp)</i> ■ <i>bootps(udp)</i> ■ <i>dns(udp)</i> ■ <i>telnet(tcp)</i> ■ <i>trace(tcp)</i> ■ <i>snmp(tcp)</i> ■ <i>capi(tcp)</i> ■ <i>tapi(tcp)</i> ■ <i>rfc1086(tcp)</i> ■ <i>http(tcp)</i> ■ <i>nbns(udp)</i> ■ <i>statmon(udp)</i>.
Verify IP Address	<p>Defines whether the source IP address is to be checked when an incoming request is received for the service selected under SERVICE. Possible values:</p> <ul style="list-style-type: none"> ■ <i>verify</i> ■ <i>don't verify</i> (default value).

Field	Description
IP Address	<p>Only if VERIFY IP ADDRESS = <i>verify</i></p> <p>Defines a host or network IP address from which incoming requests are allowed for the service selected under SERVICE. If a request has a different source address, the next entry is checked.</p>
Mask	<p>Only if VERIFY IP ADDRESS = <i>verify</i></p> <p>Defines a netmask. A network address is thus defined together with the IP ADDRESS, from which incoming requests are allowed for the service selected under SERVICE.</p> <p>If a request has a different source address, the next entry is checked.</p> <p>If the value of MASK is <i>0.0.0.0</i> or <i>255.255.255.255</i>, the entry is a host entry, i.e. the IP address must match exactly.</p>
Verify Interface	<p>Defines whether a check is to be made to determine which gateway interface is used for an incoming request received for the service selected under SERVICE. Possible values:</p> <ul style="list-style-type: none"> ■ <i>verify</i> ■ <i>don't verify</i> (default value).
Interface	<p>Only if VERIFY INTERFACE = <i>verify</i></p> <p>Defines the interface via which incoming request for the service selected under SERVICE are to be allowed.</p>

Table 6-1: LOCAL SERVICES ACCESS CONTROL menu fields

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