



ALG4100

Operating manual



Basic function

What is the *ALG4100*?

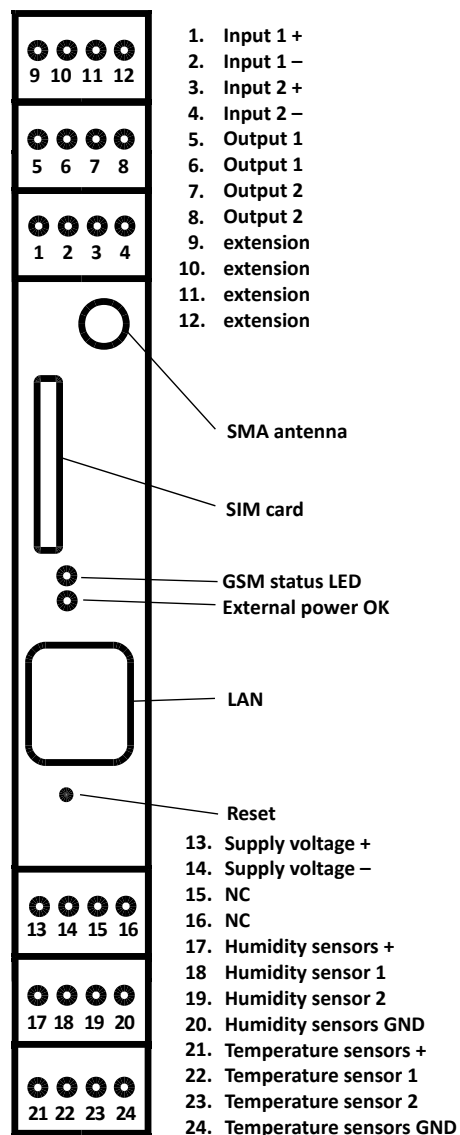
It is basically a stand-alone alarm device with an integrated GSM module. Equipped with a number of digital in- and outputs and sensors for temperature and humidity the *ALG4100* offers vast options for unstaffed monitoring and surveillance solutions. Alarm indications are notified by voice or text messages. Alarm destinations can be mobile phones, landline telephones or e-mail addresses. Requesting sensor states and applying the outputs is controlled from a remote station by e-mail or text messages.

An integrated backup unit grants a power reserve if the external power fails.

Connectors

All connections to the *ALG4100*, except the LAN network and the antenna connector, are made by terminal strips. Each terminal strip is pluggable, so a full swap of an *ALG4100* device is possible without unscrewing all single connections. To avoid unwanted interchange the plugs are coded to their position on the *ALG4100*.

Exterior view - Schematic diagram



Digital in- and outputs

For digital in- and outputs both potential-free contacts and voltage signals are used in the field. The *ALG4100* digital inputs are voltage controlled and isolated by an opto-coupler. The digital outputs are potential-free relay contacts. This combination provides the highest flexibility because a voltage controlled input can be driven by a contact and an output contact can drive a voltage load without any additional parts, just by wiring with the assistance of the supply voltage of the *ALG4100*.

Digital inputs

The *ALG4100* provides two digital inputs.

Both digital inputs are isolated and driven by voltage. By default an active input is detected when a voltage is attached. But this can be changed within the configuration setup. Alarm messages are triggered by a change of the input's status immediately or after an adjustable time delay.

Alarm messages will be repeated if a reminder is set within the configuration setup. The current status can be polled with a separate request command.

An allowed input voltage against earth of the *ALG4100* power supply ranges from -30V to +30V. Please avoid any undefined input voltages between +1,5V and +4,5V.

ALG4100 Service menu > Configuration > Digital input 1 / 2

Digital outputs

The *ALG4100* is equipped with two potential-free relay contacts working as digital outputs. An active output is closed by default. The settings can be changed within the configuration setup. Please note, that all output contacts are opened if no power supply is connected and the capacity of the backup battery is expended.

The outputs are controlled by command messages which have to be defined within the configuration menu. The *ALG4100* accepts command messages via SMS short message or e-mail. Command messages sent by e-mail service must be written in the 'Subject' field of the e-mail header.

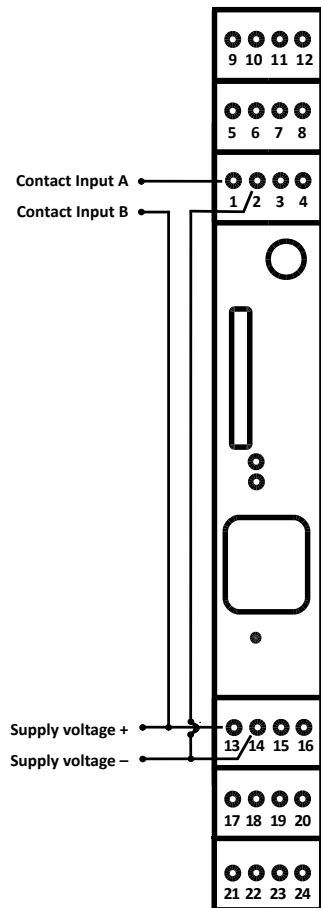
An output can work as static switch or as single-pulse switch with a variable pulse length. An allowed switching voltage against earth of the *ALG4100* power supply ranges from -30V to +30V.

The current status can be polled with a separate request command.

ALG4100 Service menu > Configuration > Digital output 1 / 2

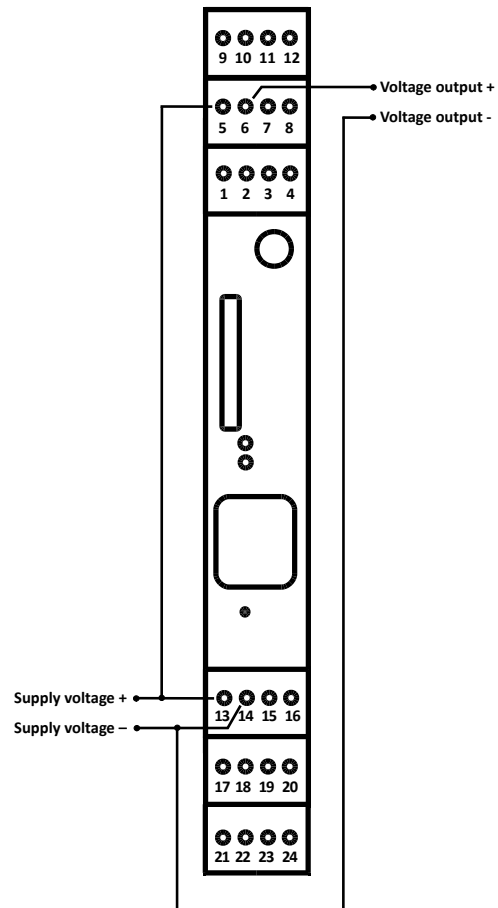
How to:

Driving an *ALG4100* input from potential-free contact:



How to:

Driving voltage load with *ALG4100* output contact:



Sensors

The ALG4100 can manage several internal and external sensors. These are sensors for temperature and for relative humidity of the air. Plus an internal sensor for the surveillance of the power supply voltage. Further external sensors are optional. To activate a sensor alarm a metering range with an upper and lower limit must be defined. This can be set within the configuration setup for each sensor. If a value gets below a limit respectively exceeds it, an alarm message is triggered to the alarm destination(s).

Alarm messages will be repeated if a reminder is set within the configuration setup. The current status of each sensor can be polled with a separate request command.

ALG4100 Service menu > Configuration > Power fail warning

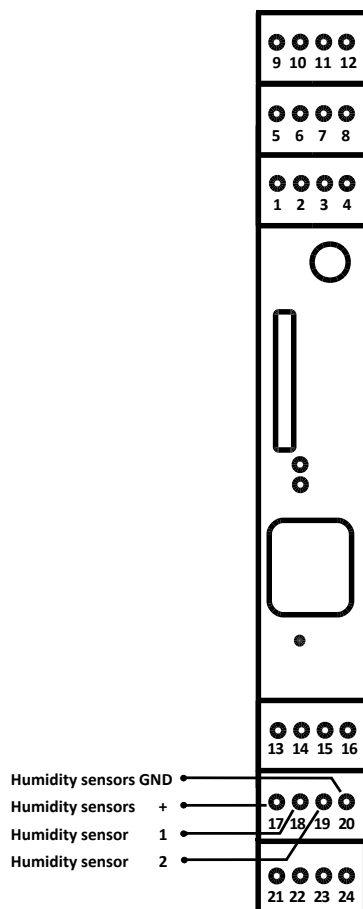
ALG4100 Service menu > Configuration > Temperature sensors > Temperature sensor 1/2

ALG4100 Service menu > Configuration > Humidity sensors > Humidity sensor 1/2

ALG4100 Service menu > Services > View Status

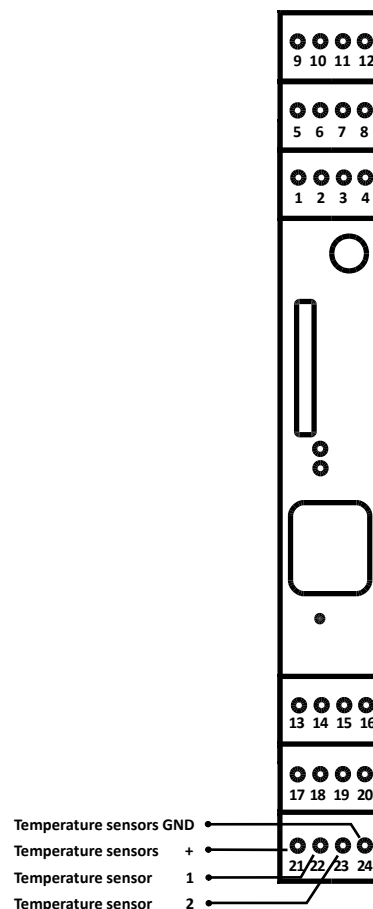
How to:

Connect a humidity sensor



How to:

Connect a temperature sensor



All environmental sensors have a three-conductor cable that must be connected to plus, ground and the sensor data.

Power supply

There is a voltage range for the power supply within the *ALG4100* can work in normal operation mode. The voltage range is from 7V to 30V DC. If the voltage gets out of this range the *ALG4100* turns into a limited operation mode with a reduced functionality of the GSM-channel, the relays and the sensors.

If a backup unit (SuperCap) is installed the *ALG4100* could stay in normal operation mode for a short time. Even there is no external power supply.

LED indicator

The pair of two-in-one LEDs on the front panel of the *ALG4100* indicates the status of the power supply and the GSM module.

The power LED lights up green when the valid power supply is connected. The valid voltage range is from 7V to 30V DC by default. This range can be modified within the configuration setup. A not valid power supply is indicated by a red lightning LED.

The LED assigned to the GSM module indicates various situations. The initializing of the GSM module is indicated by a short orange flash. It will light up steady green when it is logged into the GSM network and the signal is good. But will start flashing green when the signal is too low. The lengths of the flashing pulses indicates the GSM signal quality. The flashing gets shorter the worse the GSM signal quality becomes.

All errors are indicated by a red flashing LED:

Counter	Description	Possible cause:
1 x	GSM-channel failed	<i>GSM module crashed or broken</i>
2 x	SIM-card missing	<i>No SIM in slot</i>
3 x	SIM-card faulty	<i>SIM card broken or no compatible</i>
4 x	SIM-card requests a PIN (no PIN is set in the <i>ALG4100</i>)	<i>No PIN set within the configuration</i>
5 x	The set PIN is wrong	<i>Wrong PIN set within the configuration</i>
6 x	Last attempt to enter the PIN (not possible by the <i>ALG4100</i>)	<i>A wrong PIN has been entered two times. The third and final try must be done with a mobile phone</i>

Reset button

The reset button on the front panel offers three various modes:

1. The basic reset (reset boot) which is initiated by pushing the button for one to five seconds. The basic will cause a restart of the CPU and the GSM module, so all current processes will be interrupted. Any alarm messages triggered by open or closed inputs and by sensor values exceeding the valid range will be resent.
2. The full reset (cold boot) which is initiated by holding the button for longer than five seconds. The full reset will delete all configuration data, announcement files and security settings to restore the default settings. A full reset is successfully initiated when the power LED is flashing red/green and the reset button is released.
3. This reset mode works in addition with the full reset. As described before, holding the reset button for longer than five seconds will cause a full reset. But at the same time the LAN interface of the *ALG4100* switches into an open mode and remains open as long as the button is pressed. In this mode the *ALG4100* will listen to all IP addresses of the network. That means if the *ALG4100* is connected directly to a computer via Ethernet/LAN all possible IP addresses of the network can be used for opening the *ALG4100* Service menu in a browser window. E.g. your computer's IP is 192.168.10.20 and the network mask is 255.255.255.0 you can use the IP address 192.168.10.21 (Please avoid address endings with 0 or 255). Please note, that all network settings must be saved to the *ALG4100* before the reset button is released!

The password request is deactivated within this mode.

Please, do not use mode 2. or 3. if the *ALG4100* is connected to a corporate network, because this might cause severe network problems!

Watchdog

The 'Watchdog' ensures a save restart if basic changes in the configuration are done or a new firmware file is uploaded. A save restart is also necessary to switch from back-up operations with the backup unit (SuperCap) to normal operation mode.

LAN / Ethernet

The LAN/Ethernet connection is necessary for the configuration and maintenance of the *ALG4100*. Additionally the LAN/Ethernet can be used to send and receive alarm messages via e-mail service.

In a DHCP network the *ALG4100* tries to get an IP address from the DHCP server. If DHCP is not available the *ALG4100* is working with the fix **IP 192.168.0.2**. All network parameters are set automatically.

The *ALG4100* supports auto-sensing. It can be connected directly to a computer's LAN jack. No cross cable is needed. For direct *ALG4100* to PC connection you can use the open (network) mode > see under 'Reset button' for details.

For the configuration and maintenance all common internet browsers are suitable.

ALG4100 Service menu > Configuration > LAN settings

E-mail settings

To use an e-mail address as an alarm message destination it is mandatory to assign a working e-mail account to the *ALG4100* and to connect it to a network with internet access.

For sending *ALG4100* alarm messages via e-mail you need to configure a SMTP server with username and password. For controlling the *ALG4100* by command messages via e-mail, e.g. to switch output contacts or to poll a sensor's status an exclusive mail address with a working POP3 server is necessary. (Secured connection via TSL and SSL are currently not supported)

Command messages sent by e-mail service must be written in the 'Subject' of the e-mail header.

Message 1 - alg4100@maildomain.com

Message | Attachments | Special | Merge

To: alg4100@maildomain.com

Subject: Localised lighting ON

Cc:

☐ Confirm reading ☒ Copy self ☐ Encrypt... Sig: No signature

☐ Confirm delivery ☐ Urgent ☐ Rich text ID: <Default>

- example -

Sometimes e-mails are generated automatically by servers or hardware devices. In this case the content of the command message can vary. The *ALG4100* can detect '*keywords*' (*wild cards*) within those e-mails. This '*keywords*' must be defined within the configuration menu:

*keyword	detects the relevant keyword at the end of the subject field
keyword *	detects the relevant keyword at the begin of the subject field
* keyword *	detects the relevant keyword at any position of the subject field
<command text>	to send custom command messages which contains an '*' you need to set a '' before it to deactivate the keyword detection.

ALG4100 Service menu > Configuration > Email settings

Announcement files

Before a voice message can be used as alarm message you need to add one or more announcement files to the *ALG4100* memory. There are two ways to add an announcement. First you can upload a suitable audio file* via the *ALG4100* service function or secondly you can record an announcement via voice call.

*Audio format for *ALG4100* announcement files: <filename>.wav , 8000Hz, 64 kbps, mono, aLaw (codec G711-A 8000 Samples/s)

The *ALG4100* can manage up to of 40 announcement files with a total capacity of 89 sec.

To record an announcement via voice call the *ALG4100* must be logged in to the GSM network. Open an *ALG4100* configuration session with your browser and start the *ALG4100* voice call function:

Services > Manage Announcements > Accept voice call

Then call the *ALG4100* from a common phone and start recording as soon as the connection is established:

Manage Announcements > record announcement

To confirm a new announcement assign a file name to your recording.

All new announcements are available in the announcements file list of the *ALG4100* and can be selected as alarm message or site announcement in the menu.

Further announcement management option are:

Check announcements at:

Manage Announcements > Listen announcement.

Rename announcements at:

Manage Announcements > change announcement name

Delete announcements at:

Manage Announcements > delete announcements .

Load pre-produced announcements at:

*ALG4100 Service menu > File > Load file
<audio_filename.wav>**

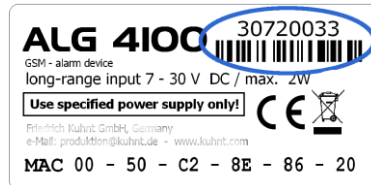
*Audio format for *ALG4100* announcement files: <filename>.wav , 8000Hz, 64 kbps, mono, aLaw (codec G711-A 8000 Samples/s)

Extension bus

The *ALG4100* can be upgraded with the 'Extension bus ' to control additional in- and outputs, sensors or other functions. Addressing is done automatically, (optional).

Device access data

The *ALG4100* is protected from unauthorised access with a username and a password. The default password is the serial number of the *ALG4100* device (Use with an empty username field).



Username and password will not be saved within the configuration file. If the username or password is unknown, a full reset will restore the default settings. Note, that all audio and configuration data will be deleted by a full reset!

ALG4100 Service menu > Settings > Device Access

Internet access via GSM t.b.c.

Import audio, configuration and firmware files

To upload data files from your computer into the *ALG4100* via the import interface you need to open a configuration session. You can import announcement files *<filename.wav>*, configuration files *<filename.cfg>* or new firmware revisions *<filename.pro>*.

Please note! The audio message assignment within your configuration must be adjusted after uploading configuration data into a blank *ALG4100*.

Update the firmware via:

File > Load file *<firmware_filename.pro>*

Please note, that The *ALG4100* will automatically cause a restart with the new revision after the upload is completed.

ALG4100 Service menu > File > Load file

Export of configuration files

Configuration data can be saved from the *ALG4100* into a file. The default file name is 'ALG4100.CFG' and is saved into the download folder of your computer

Please note, that the configuration file does not include the announcement files nor any security data such as username/password and PIN.

ALG4100 Service menu > File > Load file / Save configuration

Destination addresses for alarm messages

For each alarm message you need to create a list of destinations (appropriate persons) who should receive it. This destination list can consist of fixed line and mobile phone numbers and e-mail addresses. Each list is limited to five destinations addresses. Voice messages are sent to phone numbers only via a voice call. Text messages can be sent to all types of destinations.

Various types of destinations can be mixed within the same destination box. For text messages just type a phone number or e-mail address. To trigger a voice message prefix a lowercase 'v' before the phone number.

e.g.

v044713326677	> sends a voice mail to a mobile phone
v044302211633	> sends a voice mail to a land line extension
044713326677	> sends a text message to a mobile phone
name@domain.co.uk	> sends a text message by e-mail

It is mandatory to define a text in the text box to sent text messages. For voice messages you need to provide and assign an announcement file. For sending e-mails a working e-mail setup is required.

Text messages that are created in the free form text fields should not have more than 160 characters.

ALG4100 Service menu > Configuration

ALG4100 Service menu > Service > Manage Announcements

Site name and site announcement

If a number of *ALG4100* alarm devices sent their alarm messages to the same alarm destinations they can identify themselves by a site name or a site announcement. This individual site information is added to the alarm messages coming from each *ALG4100*.

When a site name or site announcement is defined, a text alarm consists of the
<site name + the message text>

A voice alarm consists of a
<site announcement + voice message>

ALG4100 Service > Configuration > General Settings

Setup menu (WebUI)

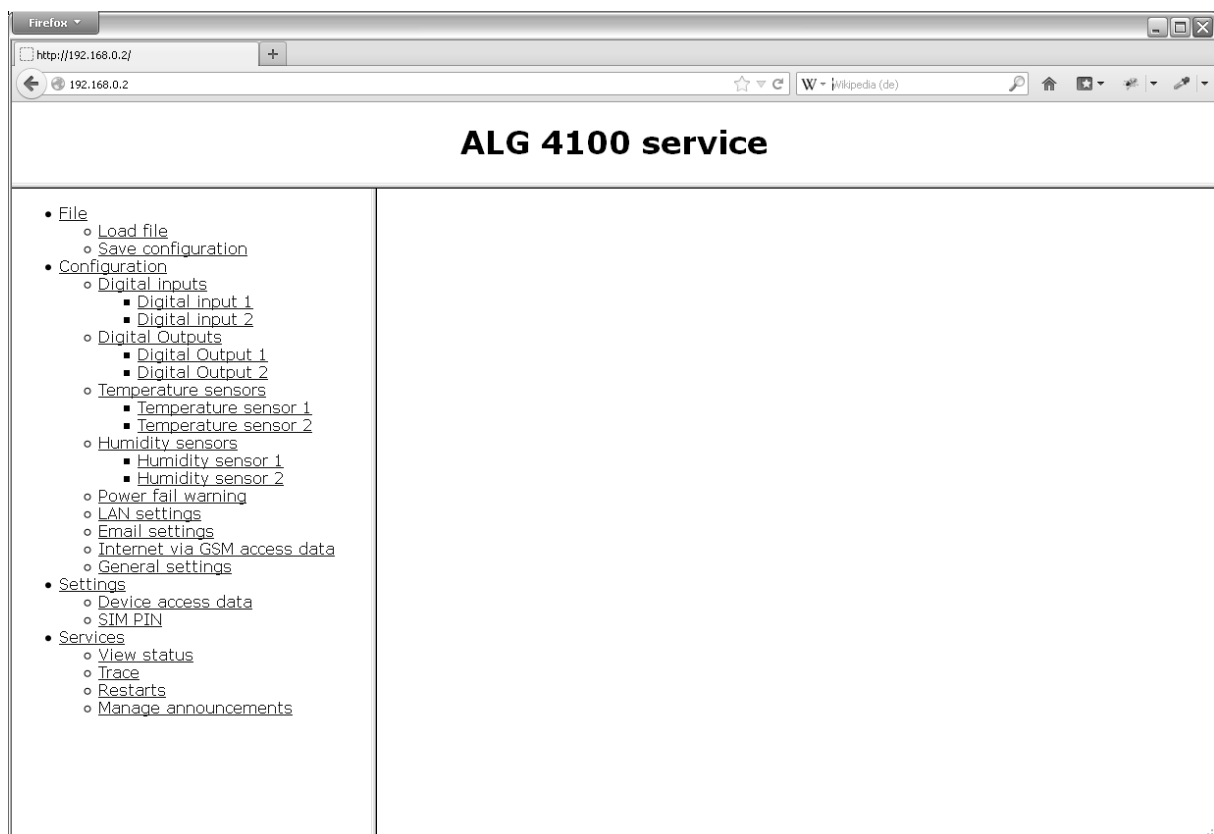
Configuration is made through a WebUI (web user interface) via a LAN connection or via a remote GSM CSD data call. You can use a common internet browsers like Mozilla Firefox®, Microsoft Internet Explorer®, Safari® or Chrome® etc. To open the WebUI in your web browser just use the IP address of the *ALG4100*.

Local access:

The default IP address is: **192.168.0.2** but DHCP is active by default. If you are not sure about the IP address of your *ALG4100* within a DHCP network use the Address Resolution Protocol (ARP) to determine it.

Remote access:

A remote access is setup via a Dial-Up-Network connection to the *ALG4100*'s mobile phone number by using a custom GSM modem. It is recommended to deactivate all other network connection during the remote session. When you are successfully connected to the *ALG4100* enter IP **192.168.254.254** in your browser to open the *ALG4100* setup menu (WebUI).



WebUI / browser screen shot

Please note:

Refresh the browser window (using F5) after a restart of the *ALG4100*. This might be necessary after a firmware upload or some changes in the configuration.

Schematic diagram of the '**ALG4100 service**' tree view:

ALG4100 service			
File	Load file		<i>loading configuration, firm-ware or announcement files</i>
	Save configuration		<i>saving configuration files</i>
Configuration	Digital inputs	Digital input 1	<i>Settings digital input 1</i>
		Digital input 2	<i>Settings digital input 2</i>
	Digital outputs	Digital Output 1	<i>Settings digital output 1</i>
		Digital Output 2	<i>Settings digital output 2</i>
	Temperature sensors	Temperature sensor 1 Temperature sensor 2	<i>Settings temperature sensor 1</i> <i>Settings temperature sensor 2</i>
	Humidity Sensors	Humidity sensor 1 Humidity sensor 2	<i>Settings humidity sensor 1</i> <i>Settings humidity sensor 2</i>
	Power fail warning		<i>Settings power fail warning</i>
	LAN settings		<i>Network settings</i>
	E-mail settings		<i>Mail settings for POP3 and SMTP</i>
	Internet via GSM access data General settings	<i>t. b. c.</i>	<i>APN settings</i> <i>Language of web server</i> <i>Station name</i> <i>Station announcement</i>
Settings	Device access data		<i>Set access authorization</i>
	SIM PIN		<i>Set SIM PIN</i>
Services	View status		<i>Device status of the GSM module, sensors, power supply, firmware etc.</i>
	Trace	View trace	<i>Overall trace log</i>
		View error trace Clear error trace	<i>error only trace log</i> <i>delete recent trace data</i>
	Restarts		<i>to force restart of GSM module or complete device, factory reset</i>
	Manage Announcements	Remove announcement	<i>delete announcements</i>
		Rename announcement	<i>change announcement name</i>
		Listen announcement	<i>audible check of announcements</i>
		Record announcement	<i>recording announcement via external phone call</i>
		Accept voice call	<i>accept connection via an external phone call</i>

How to find an ALG4100 in a network by using ARP service

Before you can open the WebUI of an *ALG4100* you need to know the IP address. In DHCP networks this is tricky sometimes. If your network is manageable small you can try to reach your *ALG4100* by trial and error. But in a more complex network this method is obviously not productive.

In this case we recommend to you to use Address Resolution Protocol (ARP) to identify the correct IP address. With the ARP service you can assign a temporary IP address to the *ALG4100*'s MAC address.

The temporary IP address must suit to the network mask of the LAN. The MAC address of the *ALG4100* is printed on the type label and is unique for each device.

Open the WebUI by using this temporary IP address and start your configuration session. Or identify the actual IP address (DHCP) within the 'Status' window and start a new session with this IP address (DHCP).

How to assign a temporary IP with ARP on a Microsoft Windows® system:

ARP command to generate a 'static' entry

arp -s <temporary IP> <MAC of ALG4100>

(Leave a blank between ARP command, the ARP option, the IP and the MAC address. The HEX values of the MAC address must be separated by a hyphen)

Example:

arp -s 192.168.100.11 00-50-C2-8E-67-22 (Windows administrator)

arp -a shows lists

arp -d deletes all entries (Windows administrator)

How to assign a temporary IP with ARP on a Linux/MacOS®-system:

arp -s <temporary IP> <MAC of ALG4100>

(Leave a blank between ARP command, the ARP option, the IP and the MAC address. The HEX values of the MAC address must be separated by a colon)

Example:

sudo arp -s 192.168.100.11 00:50:C2:8E:67:22 (Linux root)

arp -a shows list

sudo arp -d <IP des ALG4100> deletes an entry (Linux root)

Identify the IP address within the *ALG4100* menu:

Services>View Status

The static ARP entry which connects the ALG4100 with a temporary IP will be deleted by the 'arp timeout' or a restart of the computer.

Technical data

GSM module:	Cinterion MC55i, quad-band mini SIM: 1.8V or 3V
Case:	suitable for DIN rail IP20, overall width 22,50 mm H: 117mm; T: 115mm
LAN interface:	Ethernet 10/100 Base-T, RJ45
Antenna connector:	SMA
Input contacts:	2 (<i>Via terminal strip</i>) Valid voltage range against earth of the ALG4100 power supply: -30V ... +30V Not allowed voltage range: < +1.5V not assigned > +4.5V assigned
Output contacts:	2 (<i>Via terminal strip</i>) Valid voltage range against earth of the ALG4100 power supply: -30V ... +30V Max. contact current: 1A Type: opening or closing contacts
Temperature sensor:	2 (<i>Via terminal strip</i>) Metering range: -20°C ... 70°C Resolution: 0.1°C Max. measuring error at 20°C: 0.8°C
Humidity sensor:	2 (<i>Via terminal strip</i>) Metering range: 0% ... 100% Resolution: 0.1% Max. measuring error at 50%: 3%
Power supply voltage sensor:	1 (<i>internal</i>) Metering range: 4.5V ... 30V Resolution: 0.1V Max. measuring error Between 7V and 30V: 0.3V
Watchdog (internal):	1 (<i>internal</i>)

Power Supply:

Voltage range for normal operation:	7V ... 30V DC (<i>Via terminal strip</i>)
Average power consumption:	1.2W (<i>With the GSM-module logged into the network and a LAN active</i>)
Max. power consumption:	5W (<i>With an active voice communication and charging the backup unit</i>)
Max. charging time for backup unit:	10 minutes
Average power consumption at idle mode:	Less than 0.5W (LAN not connected)
Operable temperature range:	Operation mode: -20°C ... 55°C Storing: -40°C ... 85°C

Alarm Module <i>ALG4100</i>	Order-Nº. :	220894
Power supply (7.5V DC / 3A)	Order-Nº. :	211828
Power supply DIN rail (24V DC / 1A)	Order-Nº. :	211233
Temperature sensor	Order-Nº. :	211232
Humidity sensor	Order-Nº. :	211574
Mini antenna:	Order-Nº. :	211234
Backup unit (SuperCap)	Order-Nº. :	211602
Extension unit	Order-Nº. :	-----

