AEG ID
INTELLIGENTIFICATION™

Antenna multiplexer AMP 4/8

Installation guide

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1 Introduction

This document will describe the components of the AMP 4/8 and the procedure how to do the first set up of the reader.

The main features of the reader are listed below:

- up to 8 antennas connectable
- integrated RS232 or USB interface
- 3 different types of controlling possible (RS232/USB, with the reader ARE i2, with digital inputs)
- power supply from 9V DC to 30V DC (see chapter 2.3)
- compact housing
    - the protection class of the housing is IP65

2 Installation

To ensure a proper function of the AMP 4/8 you have to follow the steps in following chapters. The installation should be done by trained people.

2.1 Mounting of the housing

The AMP 4/8 can be mounted to any other mechanic construction. It is recommended to protect the housing against heavy mechanical interactions and drippy fluids.

With the help of the plastic bars, the reader can be mounted or screwed on to the most fastening elements without open the housing of the device.

2.2 Grounding of the AMP 4/8

The AMP 4/8 should be grounded. The connector is placed at the side of the housing (6.35 mm flat contact).
To avoid EMV-problems, the cable to ground ought to be very short with low impedance.

Attention!

The topology of the ground wires must be done in the right way (according state of art).

2.3 Connecting of the plug

Attention!

Be sure that the grounding of the reader is well done and the power supply is not connected(chapter 3.2). Otherwise the electronic may be destroyed by electrostatic discharge (ESD).

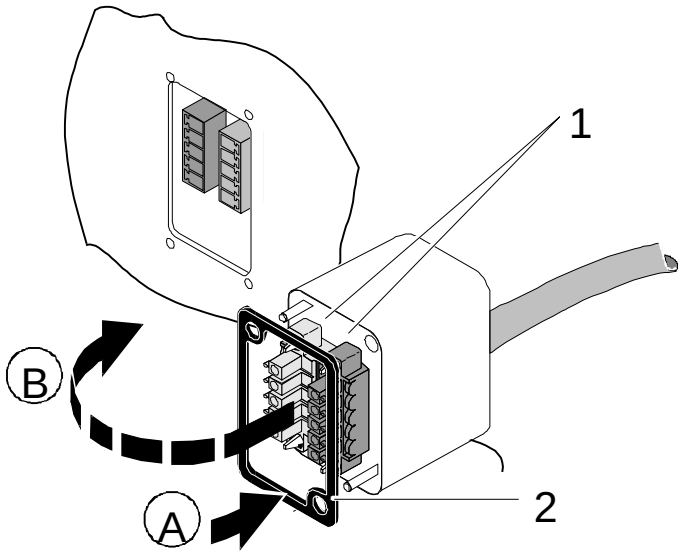


Figure 1: connecting the plug

Put on the sealing 2 to the SAB Cab (A).

Plug in the SAB Cab to the connector at the bottom of the reader device (B).

There is only one way to plug in the SAB Cab to the connector rim of the reader.

Fasten the SAB Cab with the help of the screws.

To meet the protection class of IP 65, it's necessary to apply a turning moment of 0.5 Nm to the screws.

2.4 Connecting of the power supply cable

The reader has to be supplied with 9..30V DC. The maximum output power of the power supply has to be 1.2 Watt. Be sure that you use the right polarity.

It is very important to power the AMP with a clean ground (without any electrical interferences). The best way is, to use the same ground as the reading system.

2.4.1 Using the connecting cable for AMP und ARE i2 (RS232)

Power supply:	brown =	+ 9 .. 30 Volt
	white =	ground

2.4.2 Using the switchboard cable for AMP (RS232)

Power supply:	brown =	+ 9 .. 30 Volt
	white =	ground
Interface:	green =	RXD (Dataout AMP 4/8)
	yellow =	TXD (Dataout AMP 4/8)
	grey =	ground

2.4.3 Using the switchboard cable for AMP (binär)

Power supply:	brown =	+ 9 .. 30 Volt
	white =	ground
binary control:	green =	B0
	yellow =	B1
	grey =	B2
	pink =	B3

2.4.4 Using a self assembled connecting cable

Using the following SAB cabs you can assemble your own connecting cable.

ID 70211	SAB cab with 1 PG9 cable pipe
ID 70215	SAB cab with 2 pre-assembled cable pipes
ID 70219	SAB cab without any cable pipe

You can use any shielded five-pole cable. The allowed diameter of the cable must be in the range from ∅3,5 to ∅8mm. For this case, IP 65 is reached.

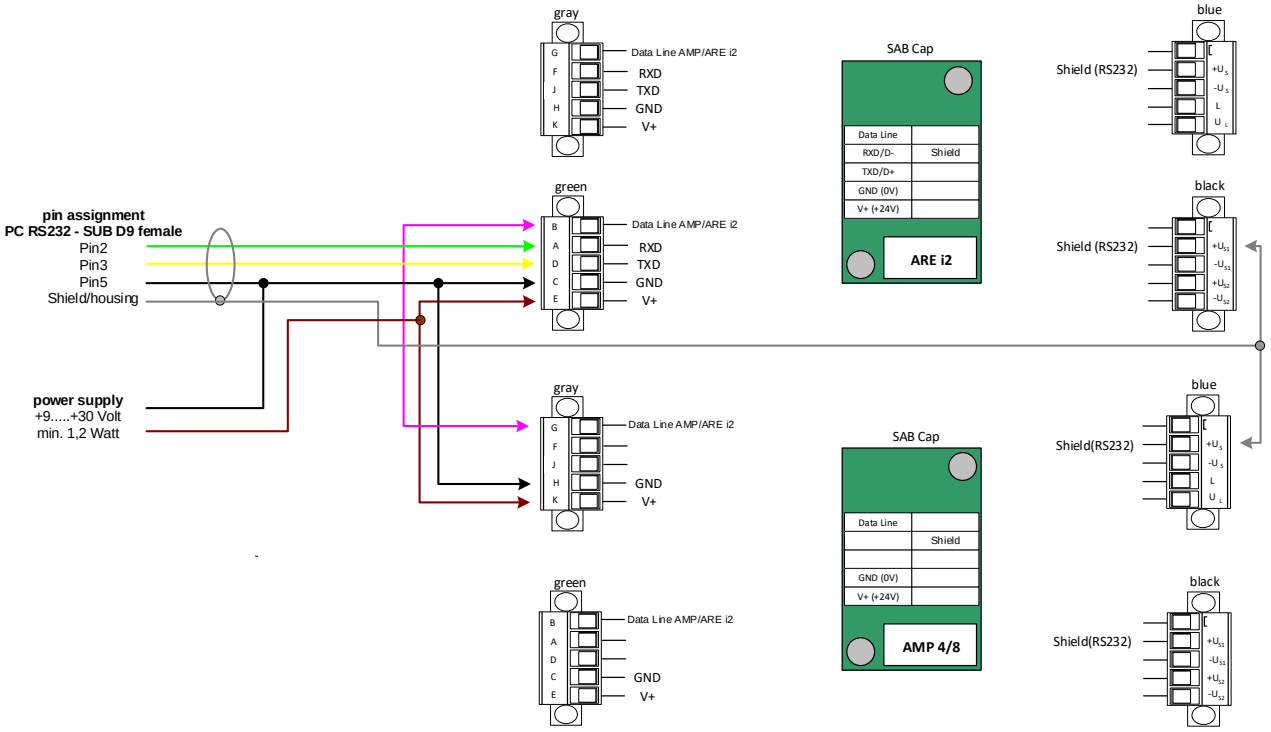
Attention!

The minimum voltage at the readers input mustn't be lower then 9V.

The maximum length of the serial RS232 cable is 15m.

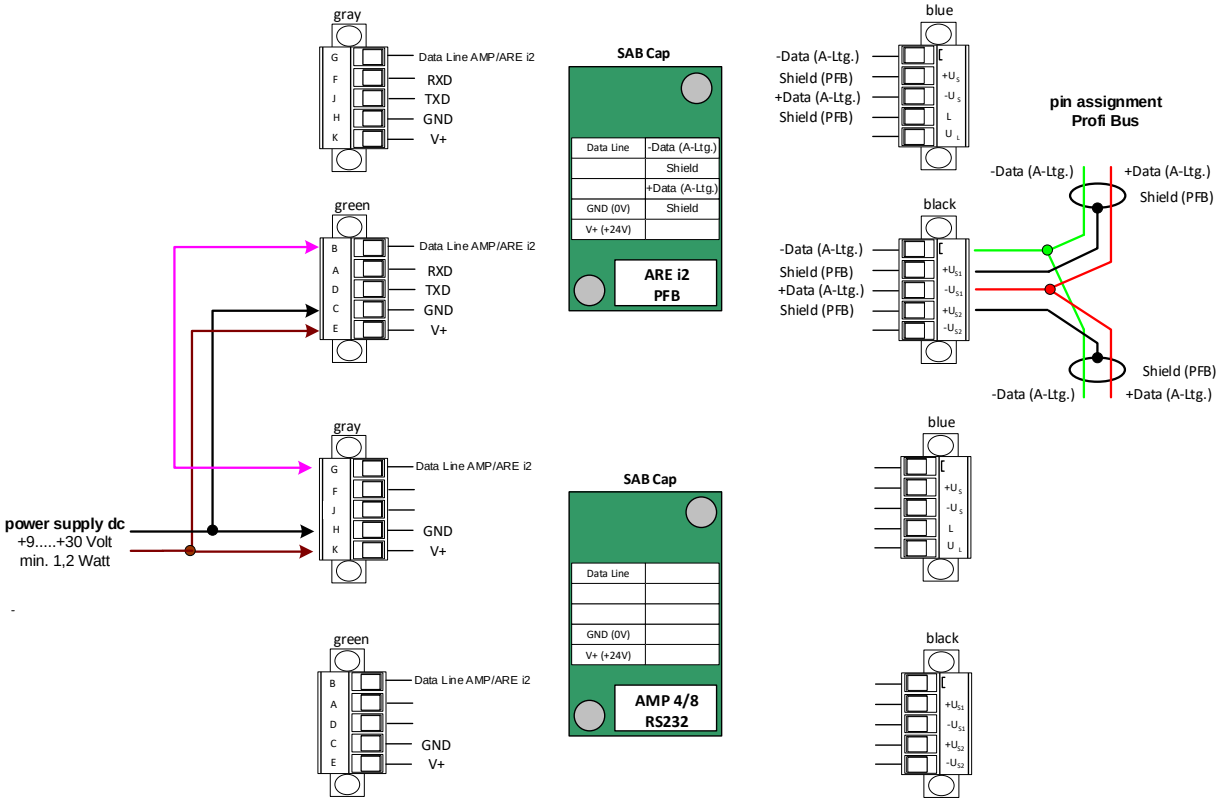
2.4.4.1 Connecting AMP and ARE i2 RS232

Schematic diagram
ARE i2 RS232 and AMP RS232
Schaltplan
ARE i2 RS232 und AMP RS232



2.4.4.2 Connecting AMP and ARE i2 Profibus

Schematic diagram
ARE i2 PFB and AMP RS232
Schaltplan
ARE i2 PFB und AMP RS232



2.4.4.3 Assembling of the cable pipe

- Breakthrough the prepared areas at the surface of the SAB Cabs. There are two prepared areas seen at the SAB Cab: central and at one side of the cab.

- The o-ring (3) has to be assembled proberly to the cable pipe (4) to ensure the protection class IP 65.

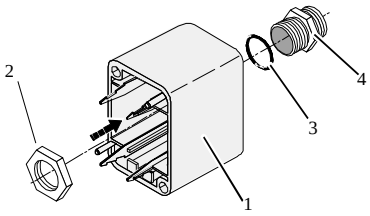


Figure 2 Assembling of the cable pipe

- Bring the nut (2) of the cable pipe inside of the SAB Cab (1).

- To fasten the nut please use the right tool (17mm).

2.4.4.4 Mounting of the cable

The cable must be mounted in following steps:

- Remove all inner parts from the cable pipe at the SAB Cab (1) (nut (5), cable fastener (3), pipe(4)) (see Figure 4)

- Put all the removed parts (nut (5), cable fastener (3), pipe (4),) and the cable pipe of the SAB Cab as well (1 to 4) to the cable.

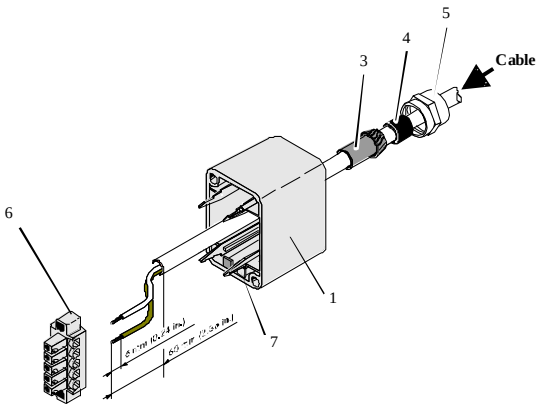


Figure 3 Mounting for the cable

- Remove the outer isolation of the cable at a length of 6cm .

- Remove the isolation of the wires at a length of 6mm and stick a covering hull to the litz wire.

- Put the cable to the cable pipe. The length of the cable coming out the SAB Cab must long enough to do all further installation steps in an easy way.
- Stick the pipe (4) into the cable fastener (3).
- Stick the cable fastener (3) into the cable pipe.
- Connect the cables into the right places of the MINI-COMBICON-Connectors (6).
- The pin assignment is shown in the figure below.
- Put the MINI-COMBICON-Connectors into the SAB cab. Look after the color coding.

2.4.4.5 Pin assignment of the SAB connector

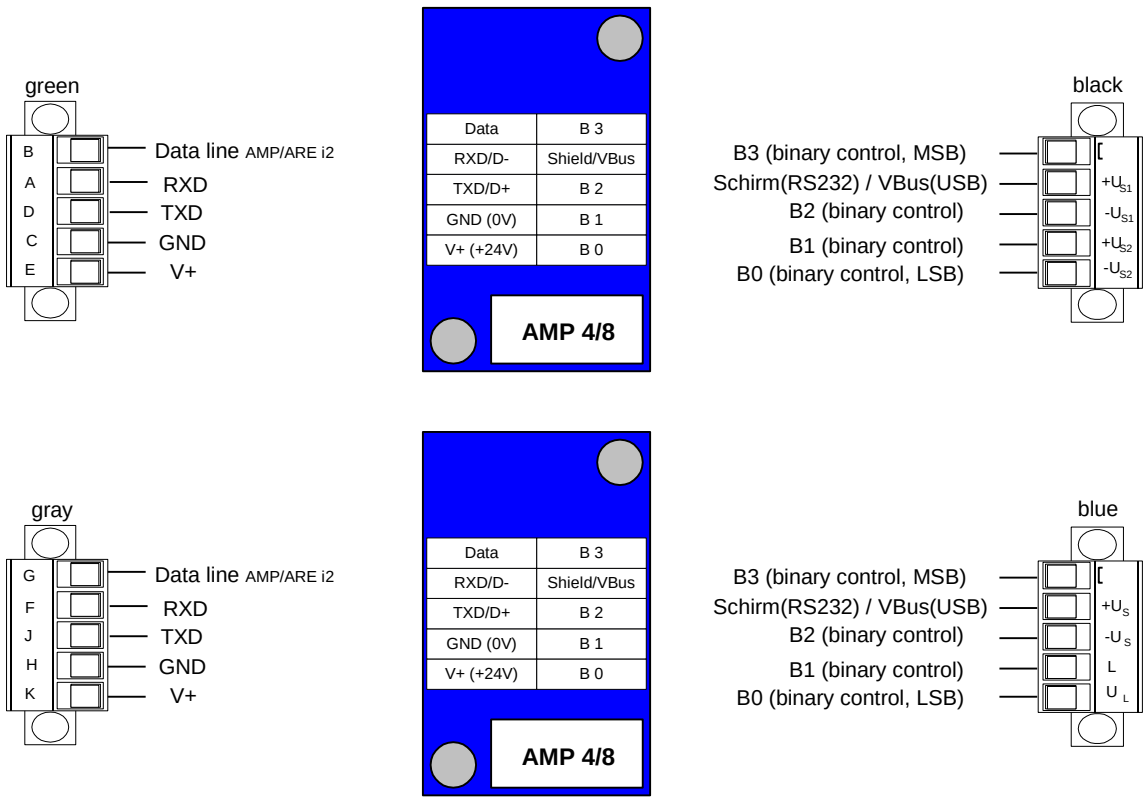


Figure 4: Pin assignment of the SAB connector

3 Visual signal lamps

You can see the state of the AMP 4/8 on the lamps.

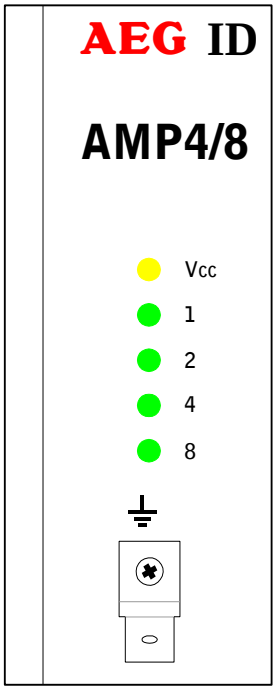


Figure 1: visual signal lamps

Vcc: twinkles, if the processor works

1, 2, 4, 8: show the active channel of the AMP 4/8 (binary)

examples:

LED 1:	channel 1
LED 2:	channel 2
LED 2 + LED 1:	channel 3
LED 4:	channel 4
LED 4 + LED 1:	channel 5
LED 4 + LED 2:	channel 6
LED 4 + LED 2 + LED 1:	channel 7
LED 8:	channel 8

4 Instruction set / structure of the instruction set

4.1 Generall

The command set described below defines the transfer of data on the serial interface.

The commands consist of a command code and optionally of a parameter value. Commands are terminated by the control character <CR> (13h). The control character serves as command line terminator.

Command codes and parameters, that means all letters and numerical values, are principally transmitted as a sequence of ASCII characters (the value 255 (decimal) consequently as 32H, 35H, 35H; the command RST as 52H, 53H, 54H).

4.1.1 Entering instructions

The protocol format is as follows

Command <SP> parameter <CR>

The space character <SP> separates commands from parameters and the <CR> character acts as command line terminator.

For commands without parameter values (e.g. GT) the <SP> character and parameter values are omitted. The command line is as short as this:

Command <CR>

4.1.2 Incorrect instruction / error codes

If a command is not entered correctly, the reader sends one of the following error codes:

wrong instruction:	<NAK> #00 <CR>
wrong value :	<NAK> #02 <CR>
EEPROM error:	<NAK> #03 <CR>
inputbuffer overflow:	<NAK> #05 <CR>
wrong mode for instruction:	<NAK> #07 <CR>

4.1.3 Upper and lower case

The instructions set isn't case sensitive.

4.2 Change of the mode

There are 3 different modes that can be used:
Mode 1: controlling via RS232/USB

Mode 2: controlling via ARE i2
Mode 3: controlling via digital inputs
The different modes affect just the controlling of the different channels. All other instructions are still usable via the RS232/USB interface.
You have to use the instruction VSAVE after setting the mode, to save the changes permanently.

instruction: MO <SP> 2 <CR>

answer: 2 <CR>

4.3 Changing the channel

The instruction to change the channel depends on the used mode. (see chapter 4.2)

Mode 1 (instruction on AMP) and mode 2 (instruction on i2):

instruction: MP <SP> 1 <CR>

answer: 1 <CR>

The parameter 1..8 switches the channels 1..8 for the AMP 8 and the parameters 1..4 switch the channels 1..4 of the AMP4. The parameter 0 switches all channels off.

Mode 3:

The controlling is binary via the states of the digital inputs.

4.4 Version

This instruction is used to get the firmware version of the AMP 4/8.

instruction: VER <CR>

answer: AEG ID AMP 4 V1.423<CR>

4.5 Initialiation with default parameters

This instruction sets back the parameters to default values.

instruction: INIT <CR>

answer: ok <CR>

4.6 Saving of the parameters

The instruction VSAVE is used to store the actual parameters to the EEPROM.

instruction: VSAVE <CR>

answer: ok <CR>

4.7 Changing the baudrate

With this instruction you can change the baudrate of the AMP 4/8. The default setting is 2 (19200 baud). This instruction has to be saved with the instruction VSAVE. The AMP 4/8 is effected after a warmstart (RST) or coldstart. If there are different settings in the AMP and the host PC it is not possible to communicate.

instruction: BD <SP> 2 <CR>

answer: 2 <CR>

The possible baudrates are:

0	4800 baud
1	9600 baud
2	19200 baud
3	38400 baud

4.8 Warmstart with saved parameters

This instruction reboots the AMP 4/8 with the saved parameters.

instruction: RST <CR>

answer: <CR>

5 System overview

The complete reading system contains the AMP 4/8 and the reader ARE i2.

There a 3 different modes to use the AMP 4/8:

- Mode 1: RS232/USB communication
- Mode 2: communication via the ARE i2
- Mode 3: binary controlling via the digital in puts

5.1 Controlling via RS232/USB (mode 1)

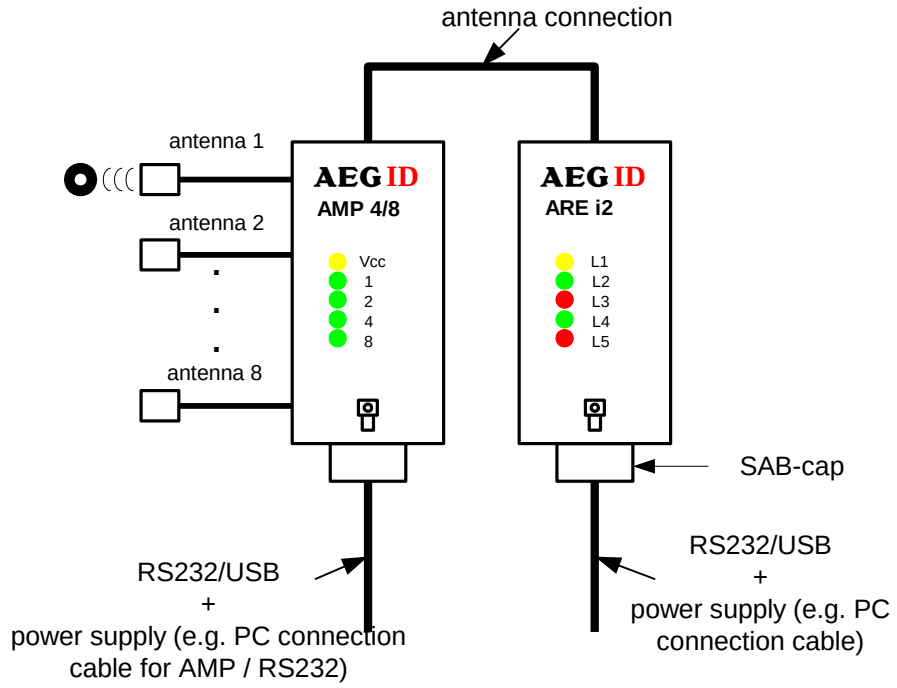


Figure 2: system overview controlling via RS232/USB (mode 1)

The typical sequence in mode 1 is as follows:

1. Using the RS232 interface of the AMP 4/8

   VER<CR> -> version query of the AMP 4/8 (e.g. "AMP 8 V3.012")

   MP2<CR> -> switching to antenna channel 2

2. Using the RS232 interface of the reader ARE i2

   GT<CR> -> reading the transponder in the field of antenna 2

3. Using the RS232 interface of the AMP 4/8

MP4<CR> ->switching to antenna channel 4

4. Using the RS232 interface of the reader ARE i2

   GT<CR> -> reading the transponder in the field of antenna 4

5.2 Controlling via reader ARE i2 (mode 2)

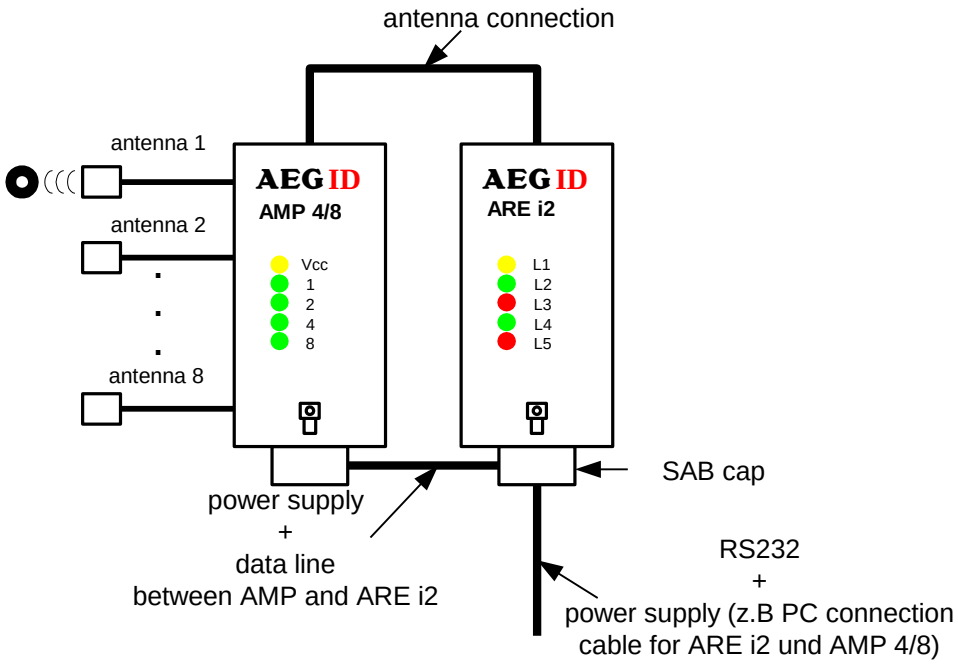


Figure 4: system overview controlling via reader ARE i2 (mode 2)

In mode 2 the power supply and the data line of the AMP 4/8 is connected directly to the SAB cap of the ARE i2.
There is a PC connection cable available with this wiring.
It is important not to change the SAB cap of the AMP 4/8 with the SAB cap of the ARE i2.
If you use your own cable be sure with the pin assignment of the AMP 4/8 (chapter 2.4.4.3) and the ARE i2.

The typical sequence in mode 2 is as follows:

VER<CR> -> version query of the ARE i2

MP3<CR> -> switching to antenna channel 3

GT<CR> -> reading the transponder in the field of antenna 3

MP4<CR> -> switching to antenna channel 4

GT<CR> -> reading the transponder in the field of antenna 4

5.3 Controlling via digital inputs (mode 3)

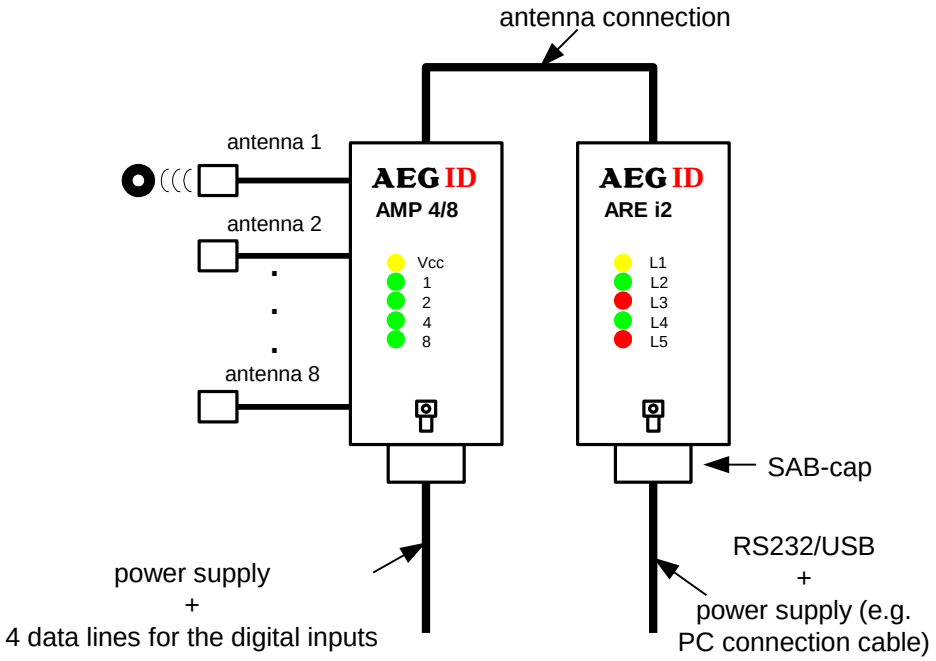


Figure 5: system overview controlling via digital inputs (mode 3)

In mode 3 the power supply of the AMP 4/8 and the ARE i2 are seperatly. The switching of the channels is done binary via the digital inputs. The inputs are low-activ, that means that you have to pull them to ground to get a logical '1' (see figure 6).

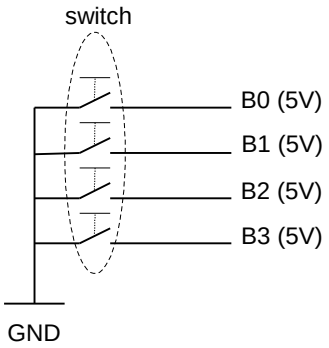


Figure 6: using the digital inputs

Examples:

- B0=0V, B1=5V, B2=5V, B3=5V -> antenna channel 1 active
- B0=5V, B1=0V, B2=5V, B3=5V -> antenna channel 2 active
- B0=5V, B1=0V, B2=5V, B3=5V -> antenna channel 3 active
- B0=5V, B1=5V, B2=0V, B3=5V -> antenna channel 4 active
- B0=0V, B1=5V, B2=0V, B3=5V -> antenna channel 5 active
- B0=5V, B1=0V, B2=0V, B3=5V -> antenna channel 6 active
- B0=0V, B1=0V, B2=0V, B3=5V -> antenna channel 7 active
- B0=5V, B1=5V, B2=5V, B3=0V -> antenna channel 8 active

After switching to a new antenna channel the ARE i2 can read the transponder in the antenna field.

Attention!

Be sure that the ARE i2 is not reading (GT or MD0) while the AMP 4/8 switches the channel. The reader can hang up or can be damaged.

6 Startup and testing the AMP 4/8

- Connect the reader via cable with the serial interface (COM) from your notebook or pc.
- Connect the reader with your power supply (9..30V DC). Look after the polarity!
- Switch the power supply on. The yellow LED of the AMP starts to blink.

- Start your terminal programme. You have to set the following settings: 8 data bits, 1 start bit und 1 stop bit, no parity check (often called 8N1), baud rate 19200 baud, no flow control(e.g. XOFF/XON).
- Send the command „VER <CR>" to the AMP. The reader answers with the actual firmware version (e.g. AEG ID AMP8 V1.3).
- Change to mode 1 with the command "MO 1" (the default value is MO 2)
- With the command "MP 1" .. "MP 8" you can change the antenna channels.

7 Hotline

If there are questions or suggestions please call the hotline:

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Fax: +49 (0)731-140088-9000

e-mail: sales@aegid.de

http://www.aegid.de

8 Revisions

25.01.10	Revision 00:	Initial revision
10.12.10	Revision 01:	Information to power supply added
17.02.11	Revision 02:	Information to clean ground added
20.01.15	Revision 03:	Pin assignment SAB connector
12.06.19	Revision 04:	Text MO and MP
08.07.22	Revision 05:	chapter 2.4.4.1 and 2.4.4.2 added

9 Anhang

A: Abmessungen

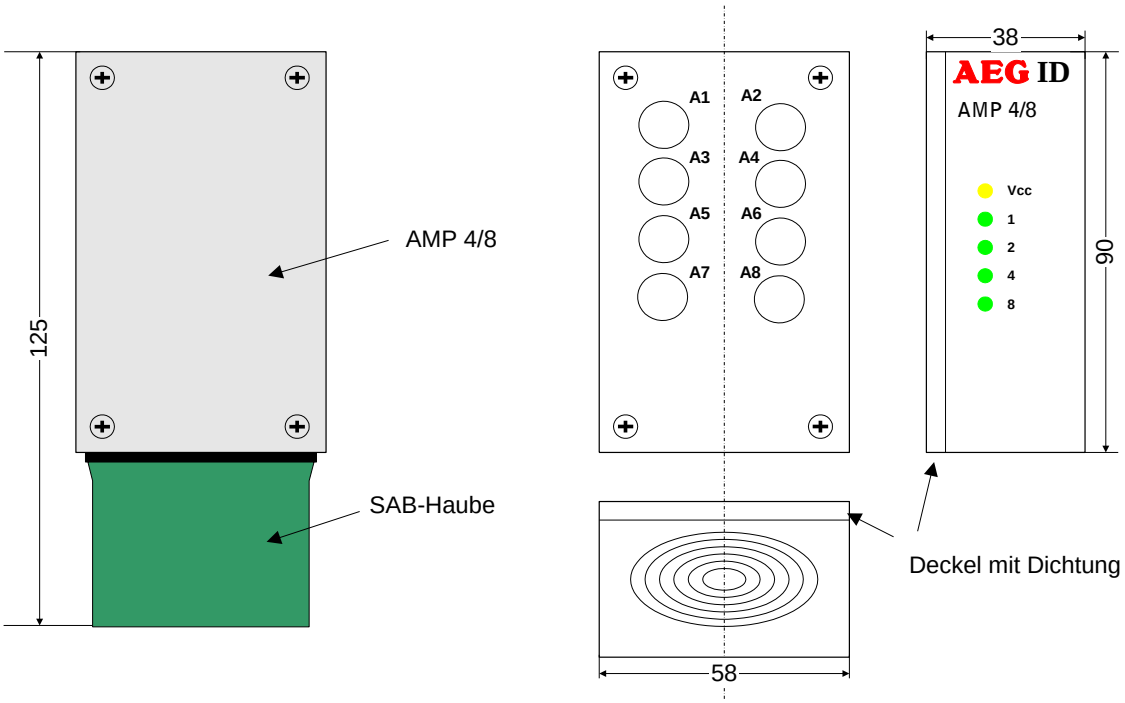


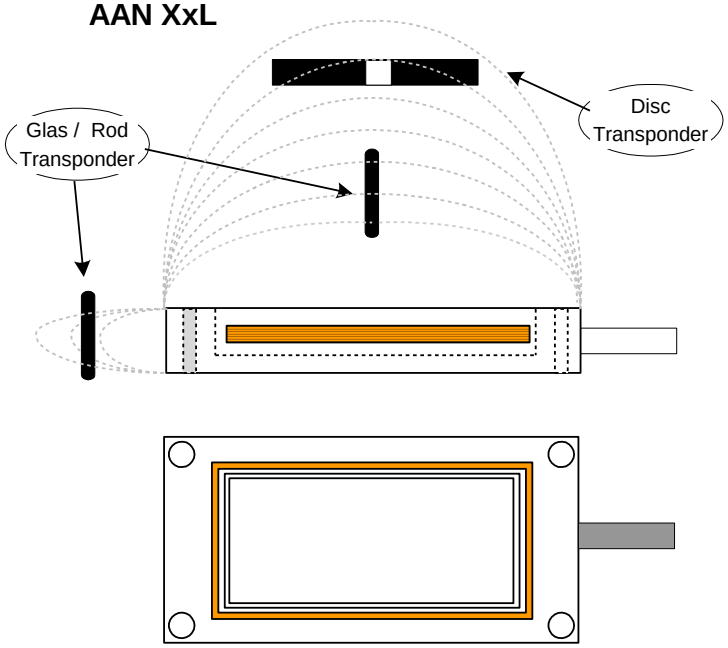
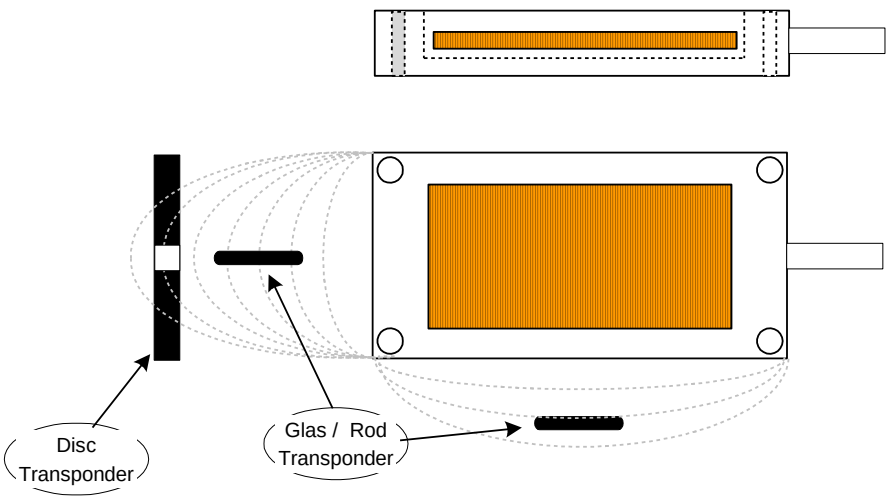
Abbildung 3: Maßbild

B: Orientierung von Transpondern

Externe Antennen AAN Xxx für kompakt Lesegerät ARE i2 und AMP 4/8 / external antenna for compact Reader ARE i2 and AMP 4/8

Lesefeld / Reading Coil
Beste Orientierung / Best Orientation

Luftspule / air coil
AAN XxL



Ferritspule / ferrit coil
AAN XxF