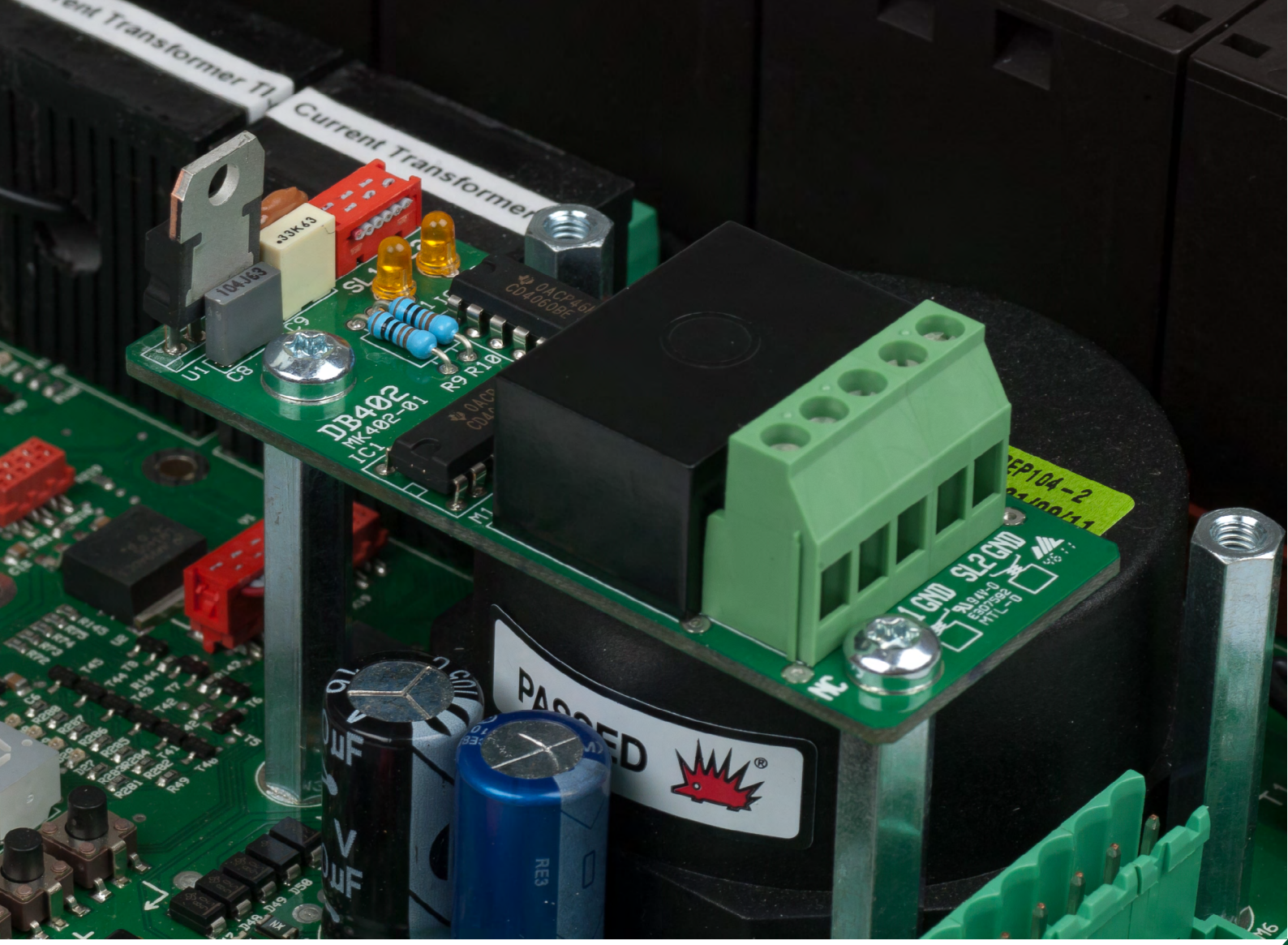


INSTRUCTION MANUAL
DAAB VEHICLE DETECTOR DB402

For DAAB automatic control unit
EP104
EP105

Revision: 7

DAAB
WE OPEN DOORS FOR YOU

FAAC Nordic AB
BOX 125, SE-284 22 PERSTORP SWEDEN, +46 435 77 95 00, support@faac.se
www.faac.se

Contents

Technical data

Dimensions (WxHxD)	33 x 80 x 20 mm
Temperature range	0 to 50°C
Inputs	2 inputs for vehicle loops
Indications	2x LEDs
Degree of protection	The circuit board is intended for internal installation in an enclosure

Safety instructions

See instruction manual for automatic control unit EP104 or EP105

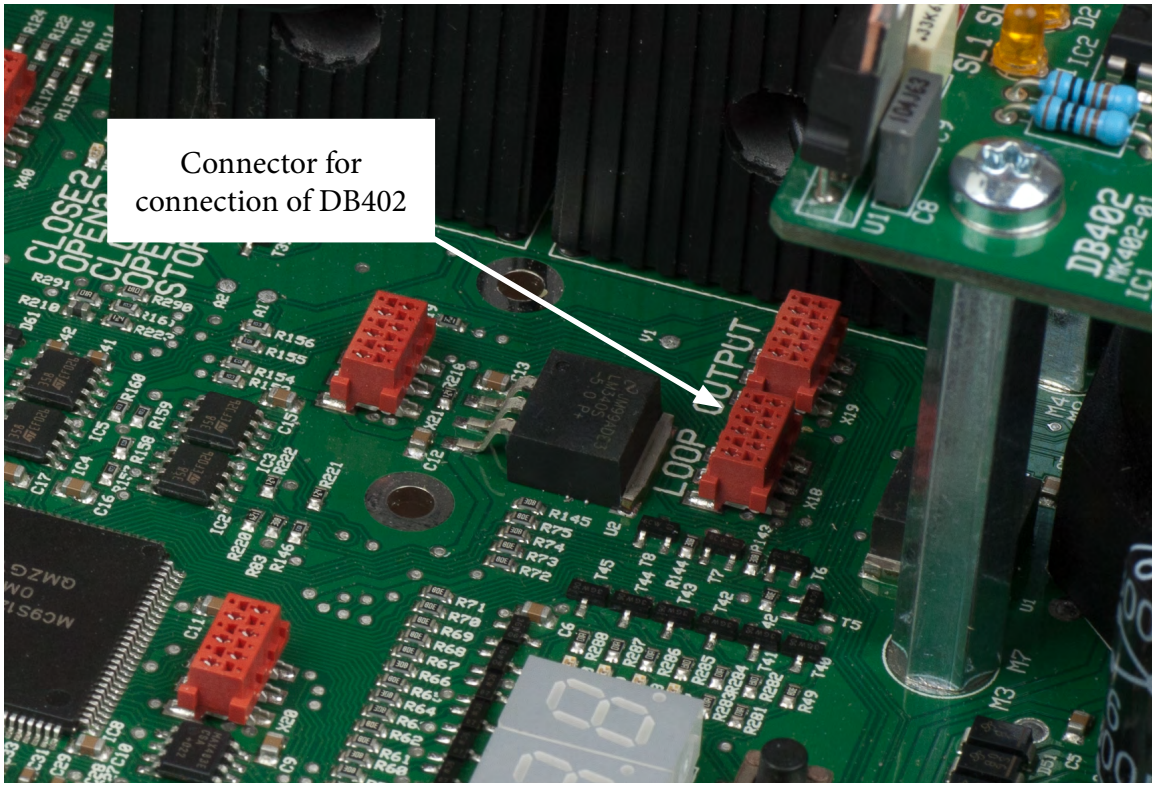
General description

DB402 is an add-in card for vehicle loops for EP104 and EP105 automatic control units. Two vehicle loops can be connected to this card. Function with activated loop is controlled by the d-channels in the automatic control unit. The vehicle sensor operates at two different frequencies, one for each loop.

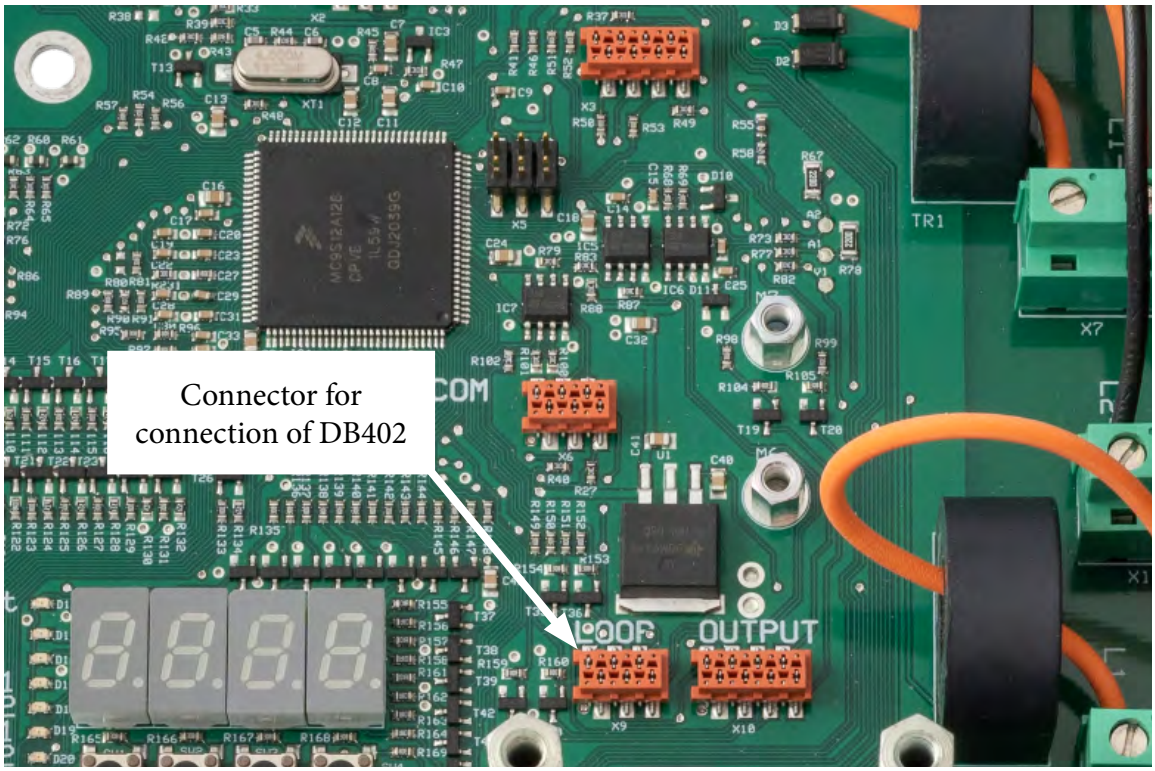
Installation of DB402

1. Discharge any static charge in your body by touching an earthed connection before handling PCB.
2. Disconnect the power to the automatic control unit.
3. Screw the DB402 card into place on the spacers on the automatic control unit using two M4x6 screws.
4. Connect cable to “LOOP” connector, see illustration below.
5. Connect loops as described under Connection on page 6.

EP104



EP105



Installation of vehicle loops for vehicle detector

• General

The loop is made of RK 0.75-1.5 mm^2, heat-resistant to at least 90 degrees, and is coiled 2 or 3 times depending on the circumference of the loop. 3 coils for circumference up to 12 m, 2 for circumference over 12 m.
Best results are obtained if the loop and connector are not joined. If this is not possible, it is very important that the joint is fully electrically reliable and watertight. The connector can be made from the same cable as the loop and must be **twisted-pair with at least 10 turns per metre between the loop and DB402.** The connector may also be shielded twin cable.

Layout of the loop

See chapter "Suggested vehicle loop layout" page 5.

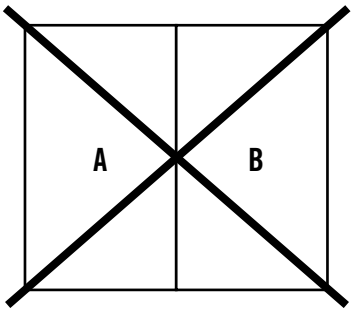
• Channel for the loop

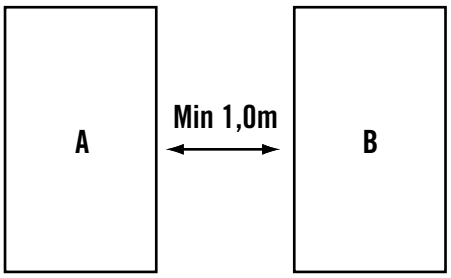
The loop is normally laid in a channel cut into the road surface. These channels are normally 5-7 mm wide and 35-50 mm deep. Corners must be truncated. The track must be clear of gravel, stones and water before the cable is laid in the channel. If necessary, the bottom of the track must be levelled to prevent future wear on the cable insulation. Take care when laying the loop to make sure that the insulation is not damaged. If necessary, fix the loop in place before backfilling the channel.
Before backfilling the channel, test the loop with the vehicle concerned.

• Loop placement

To ensure good function, note the following:

- Minimum distance from moving metal objects such as door and gates: 1.0 metre.
- Minimum distance from stationary metal objects such as reinforcement steel: 50mm.
- The connection between the loop and the connector or joins must be completely watertight. Defects or damaged insulation result in an unstable magnetic field and unreliable operation.
- Heating cables must not be in the loop or run parallel with the loop.
- High-voltage cables close to the loop may disrupt operation.
- The channel for the loop must not contain any other cables.
- The minimum distance from other loops is 1.0 metre. Direction-sensing loops forming a figure-of-eight must not be connected to the DB402; the loops must be separated as illustrated below.





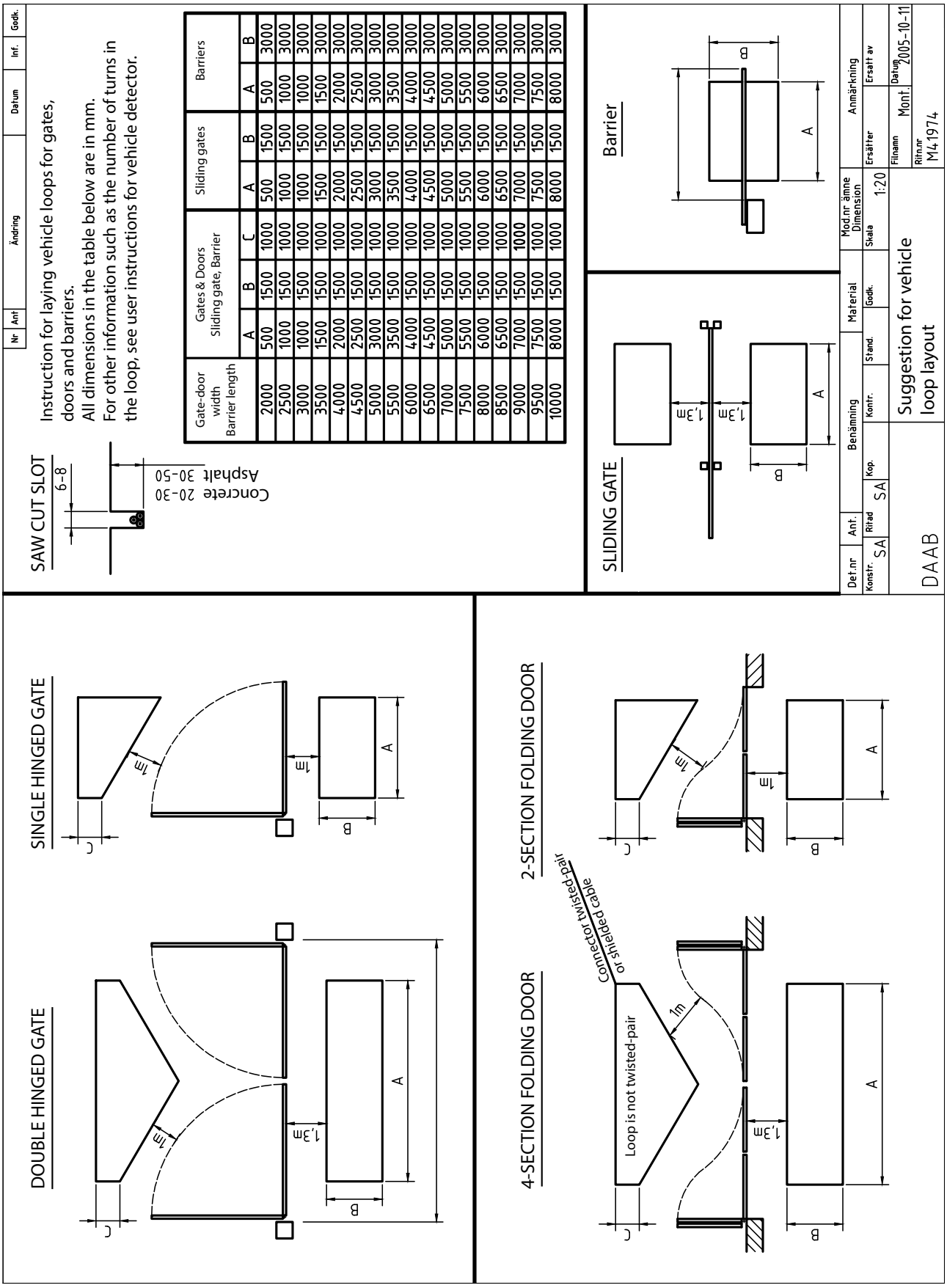
• Testing the loop

- Check that the loop and connection have electrical continuity. A series resistance of 0.5 Ω is normal – more than 5 Ω indicates poor contact.
- It is important also to check the earthing of the loop and connection. Resistance to earth, measured at 500 V, must be greater than 10 MΩ (normally 500 MΩ).

• Other

The connector of a loop may be up to 150 metres long, but sensitivity decreases with increasing length.

Suggested vehicle loop layout



Gate-door width Barrier length	Gates & Doors Sliding gate, Barrier			Sliding gates		Barriers	
	A	B	C	A	B	A	B
2000	500	1500	1000	500	1500	500	3000
2500	1000	1500	1000	1000	1500	1000	3000
3000	1000	1500	1000	1000	1500	1000	3000
3500	1500	1500	1000	1500	1500	1500	3000
4000	2000	1500	1000	2000	1500	2000	3000
4500	2500	1500	1000	2500	1500	2500	3000
5000	3000	1500	1000	3000	1500	3000	3000
5500	3500	1500	1000	3500	1500	3500	3000
6000	4000	1500	1000	4000	1500	4000	3000
6500	4500	1500	1000	4500	1500	4500	3000
7000	5000	1500	1000	5000	1500	5000	3000
7500	5500	1500	1000	5500	1500	5500	3000
8000	6000	1500	1000	6000	1500	6000	3000
8500	6500	1500	1000	6500	1500	6500	3000
9000	7000	1500	1000	7000	1500	7000	3000
9500	7500	1500	1000	7500	1500	7500	3000
10000	8000	1500	1000	8000	1500	8000	3000

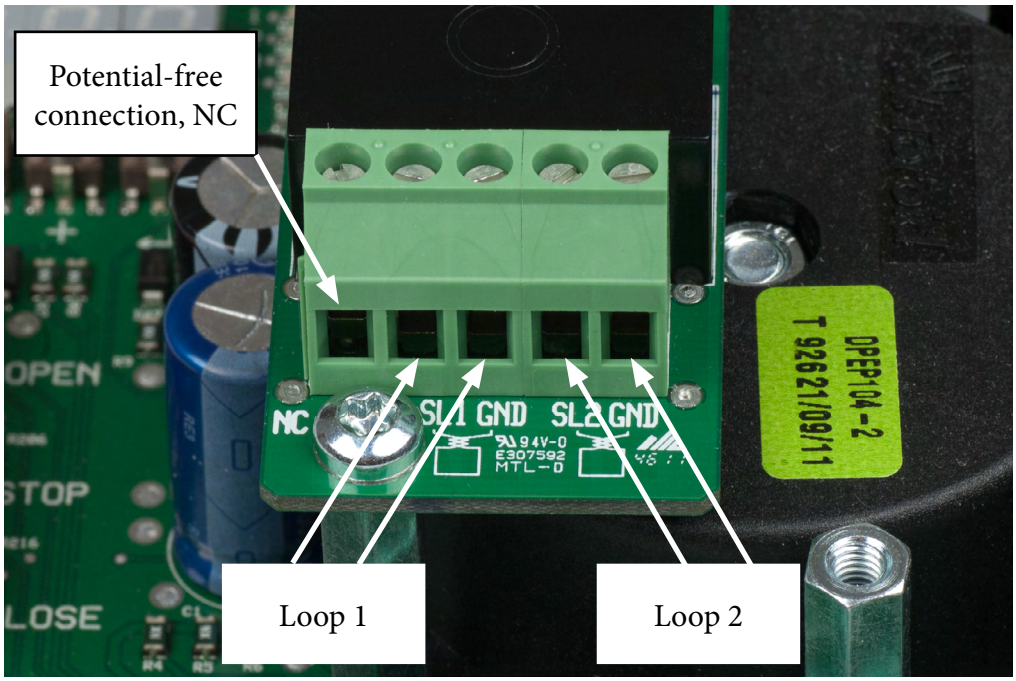
Connection of vehicle loops to DB402

If two loops are used, the one with the longest loop must be connected to input SL1. Note that installation must be carried out by a qualified electrician and that the power supply must be cut when connecting the connectors.

1. The connector from the loop must be twisted-pair with at least ten turns per metre.
2. If one loop is used, it should be connected to SL1, as illustrated (SL1=Loop 1).
3. If two loops are used, they should be connected to SL1 and SL2, as illustrated (SL2=Loop 2).
4. If three loops are used, with two loops having the same function, these two must be connected in series using input NC, which is a potential-free contact. It is important to remember that the loops must be of equal circumference to achieve reliable function.

Indications

There are two yellow LEDs on the detector card, of which the left one indicates loop 1 and the right one indicates loop 2. A constantly lit LED indicates that the loops are oscillating and are most probably functioning, while an unlit LED indicates a fault in the loop. Note that despite a lit LED the loop may be inoperative. The best way to check the loop's function is to look at the readouts from the d-channels on the automatic control unit. There are two yellow LEDs on the automatic control unit that are lit when a vehicle activates one of the loops. These LEDs are located on the left of the card and are marked LOOP1 and LOOP2.



Description of function, d-channels

Two vehicle loops can be connected to the automatic control units via DB402 add-in cards – to activate the inputs set channels d100 and/or d200 to the value 1. When the unit is delivered and following a reset, channels d100 and d200 are set to 0, disabled. The settings below apply to vehicle loop 1, using channel numbers d101 – d190. The functions are the same for vehicle loop 2, except that the channels are numbered d201 – d290. See the channel reference.

Configuring the vehicle loop

Activate the vehicle loop inputs by setting channel d100 to 1.
Channels d101, d102 and d103 are used for loop readouts, and channels d110 to d195 are all used to change settings.
The value in channel d102 must be between 08 and 50, otherwise the vehicle loop will not work correctly.
Basic settings for the vehicle loop:

- Detection limit

Set the value in channel d110 to detect vehicles on the vehicle loop.
Set the difference between on and off in channel d111

- Vehicle loop reset

There are two channels you can use to reset presence on the vehicle loop – d121 for times between 00 – 99 seconds and d120 for longer times between 005 – 240 minutes.
The timer starts when the vehicle loop is activated, and the loop is reset even if there is still a signal at the loop when the timer ends.

- Compensation for door halves

These channel are used if the door halves activate the loops as they open or close. Open and close the door – the readout in channel d103 indicates the time of loop activation. Enter the time and increase it until the door no longer activates the loop, using channel d131 for the door half operated by motor 1 and d132 for the door half operated by motor 2.

Vehicle loop functions

A number of functions are available when a vehicle loop is activated, using the following channels:
d151, Loop-based closing
Use can use this channel to activate loop-based closing. The value 1 activates loop-based closing and 0 deactivates loop-based closing.

d154, Type of loop closing
This channel works with d151 to control the function of loop-based closing. Either the door closes as soon as the vehicle loop is no longer activated (option 1), or it is left to open fully before closing (option 2).

P160, Control function
This channel is used to enable the opening function with the vehicle loop. The value 0 disables the opening function, and the value 1 activates it.

d161, Type of control signal.
This channel works with d160 and determines the type of the open signal from the vehicle loop – either a pulse (option 0) or a constant signal while the vehicle loop is activated (option 1).

d162, Half operation
This channel defines which motor will be opened by the vehicle loop. The value 1 opens motor 1, 2 opens motor 2, and 3 opens both motors 1 and 2.

d163, Limited opening
EP104:
If you want limited opening, set this channel to the value 1, the door will then open according to the set time in C412 and C414 when a limit switch is used or a specified number of degrees in L116 and L126 when an encoder is used.

EP105:
If you want limited opening, set this channel to the value 1, the door will then open according to the set time in C216 and L226 when a limit switch is used or a specified number of degrees in L116 and L126 when an encoder is used.

d170, Enable operation from a programmable input
This channel allows you to disable the opening function from a programmable input. Make sure that the programmable input is active and that all the settings have been disabled. The opening function of the vehicle loop will work for as long as there is a signal present at the programmable input specified in this channel.

d175, Delayed opening
This channel delays the open signal, for example to ensure that the door is not opened by passing cars that are not heading for the door. The channel is set to the number of seconds you want to delay the open signal.

d190, Interlock, Used to send interlock opening to remote door.

Loop safety functions

You can use the following channels to select and configure these safety functions.

d140, Safety when closing

Used to configure the safety setting in the closing movement. The value 0 means the function is disabled – note that the door will close even if there is a vehicle on the loop. Set the value to 1 to reverse the door when something is detected by the vehicle loop, set the value to 2 to send a stop signal with automatic closing, or set the value to 3 to send a stop signal without automatic closing. The automatic closing timer starts when the vehicle exits the loop.

d141, Safety during run-on time

This channel activates safety during the run-on time The safety function is the same as specified in d140. Set the value of this channel to 0 to disable safety during the run-on time, or 1 to activate it.

d142, Safety function when opening

This channel sets the safety function in the opening movement – 0 means the function is disabled. The value 1 means reverse, 2 means stop with automatic restart when the loop is clear, and 3 means stop and wait for a new control signal, 4 provides a safety function only in the closed position.

Channel list, d-channels

Vehicle loop 1

Note that the display of the d-channels is determined by the setting in C702 for EP105

No.	Name		Range	Factory	Setting
d100	Vehicle loop 1		0 – 1	0	
	0	Disabled			
	1	Enabled			
d101	Loop reading x1		000 - 999		
d102	Loop reading x1000		00 - 99		
d103	Activation by passing vehicle		000 - 999		
d110	Detection limit for a vehicle in the loop		05 - 99	15	
d111	Difference between on and off in the loop		00 - 50	03	
d120	Loop presence reset		000 and 005-240 minutes	120	
d121	Fast loop presence reset		00-99 seconds	00	
d131	Compensation for activation from door half motor 1 on the loop in the closed position		00 - 50	03	
d132	Compensation for activation from door half motor 2 on the loop in the closed position		00 - 50	03	
d140	Safety function in closing movement		0 - 4	1	
	0	Disabled			
	1	Reverse			
	2	Stop with automatic restart of automatic closing			
	3	Stop without automatic restart of automatic closing, wait for new control signal			
	4	Safety only in open position. Used when the gate passes over the loop in the closing movement.			
d141	Safety during run-on time or disengagement angle in closing movement.		0 – 1	1	
	0	Disabled			
	1	Activated according to d140			
d142	Safety function in opening movement		0 - 4	0	
	0	Disabled			
	1	Reverse to fully closed			
	2	Stop with automatic restart of automatic closing			
	3	Stop without automatic restart of automatic closing, wait for new control signal			
	4	Safety only in closed position. Used when the gate passes over the loop in the opening movement.			
d151	Loop-based closing		0 - 1	0	
	0	Disabled			
	1	Active			
d154	Type of closing		1 - 2	2	
	1	Close immediately when loop is clear			
	2	Continue to fully open, then close			

No.	Name		Range	Factory	Setting
d160	Control function		0 - 1	0	
	0	Disabled			
	1	Open			
d161	Type of control signal when activated		1 - 2	1	
	1	Pulse			
	2	Constant signal when loop is activated			
d162	Half operation		1 - 3	3	
	1	Motor 1			
	2	Motor 2			
	3	Motors 1 and 2			
d163	Limited opening		0 - 1	0	
	0	Disabled			
	1	Opening with limit switch according to set time in channel C412/C414 with EP104, L216/L226 with EP105 or number of degrees in L116/L126 if encoder is used.			
d170	Allows the opening function, via LOOP1, using a programmable input.		0 - 6	0	
	0	Disabled, normal opening/closing function. (Programmable input has no function for LOOP1)			
	1	Opening possible only if there is a signal at programmable input 1			
	2	Opening possible only if there is a signal at programmable input 2			
	3	Opening possible only if there is a signal at programmable input 3			
	4	Opening possible only if there is a signal at programmable input 4			
	5	Opening possible only if there is a signal at programmable input 5			
	6	Opening possible only if there is a signal at programmable input 6			
d175	Opening via loop after activation during set time, the loop will not open the gate until it has been activated for the set time.		0.0-9.9 seconds	0.0	
d190	Interlock opening		0 - 1	0	
	0	Disabled			
	1	Sends a normal open signal to the remote door			

Vehicle loop 2

Note that the display of the d-channels is determined by the setting in C702 for EP105

No.	Name		Range	Factory	Setting
d200	Vehicle loop 2		0 - 1	0	
	0	Disabled			
	1	Enabled			
d201	Loop reading x1		000 - 999		
d202	Loop reading x1000		00 - 99		
d203	Activation from passing vehicle		000 - 999		
d210	Detection limit for a vehicle in the loop		05 - 99	15	
d211	Difference between on and off in the loop		00 - 50	03	
d220	Loop presence reset		000 and 005-240 minutes	120	
d221	Fast loop presence reset		00-99 seconds	00	
d231	Compensation for activation from door half motor 1 on the loop in the closed position		00 - 50	03	
d232	Compensation for activation from door half motor 2 on the loop in the closed position		00 - 50	03	
d240	Safety function in closing movement		0 - 4	1	
	0	Disabled			
	1	Reverse			
	2	Stop with automatic restart of automatic closing			
	3	Stop without automatic restart of automatic closing, wait for new control signal			
	4	Safety only in open position. Used when the gate passes over the loop in the closing movement.			
d241	Safety during run-on time or disengagement angle in closing movement.		0 - 1	1	
	0	Disabled			
	1	Activated according to d240			
d242	Safety function in opening movement		0 - 4	0	
	0	Disabled			
	1	Reverse to fully closed			
	2	Stop with automatic restart of automatic closing			
	3	Stop without automatic restart of automatic closing, wait for new control signal			
	4	Safety only in closed position. Used when the gate passes over the loop in the opening movement.			
d251	Loop closing		0 - 1	0	
	0	Disabled			
	1	Enabled			
d254	Type of closing with loop		1 - 2	2	
	1	Close immediately when loop is clear			
	2	Open fully first, then close			

No.	Name		Range	Factory	Setting
d260	Control function		0 - 1	0	
	0	Disabled			
	1	Open			
d261	Type of control signal when activated		1 - 2	1	
	1	Pulse			
	2	Signal when loop is activated			
d262	Half operation		1 - 3	3	
	1	Motor 1			
	2	Motor 2			
	3	Motors 1 and 2			
d263	Limited opening		0 - 1	0	
	0	Disabled			
	1	Opening with limit switch according to set time in channel C412/C414 with EP104, L216/L226 with EP105 or number of degrees in L116/L126 if encoder is used.			
d270	Allows the opening function, via LOOP2, using a programmable input.		0 - 6	0	
	0	Disabled, normal opening/closing function. (Programmable input has no function for LOOP2)			
	1	Opening possible only if there is a signal at programmable input 1			
	2	Opening possible only if there is a signal at programmable input 2			
	3	Opening possible only if there is a signal at programmable input 3			
	4	Opening possible only if there is a signal at programmable input 4			
	5	Opening possible only if there is a signal at programmable input 5			
	6	Opening possible only if there is a signal at programmable input 6			
d275	Opening via loop after activation during set time, the loop will not open the gate until it has been activated for the set time.		0.0-9.9 seconds	0.0	
d290	Interlock opening		0 - 1	0	
	0	Disabled			
	1	Sends a normal open signal to the remote door			

Notes:

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