# ProLoop

FAAC

Programmable loop detector for controlling of gates and barriers as well as for regulating and counting cars in parking areas

Operating Instructions

1 Installation of the loop detector

The loop detectors must only be placed in dry rooms or control cabinets that are protected against all types of moisture and wetness. The ambient temperature is not allowed to exceed 60 °C. The connection wire to the loop must be twisted at least 20 times per metre or be shielded. The installation of the induction loop is described in other operating instructions.

2 Overview
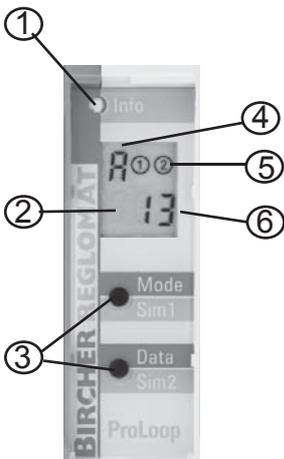
①	Status LED:	Green = Automatic Orange = Simulation Red = Fault
②	Multifunctional LCD display	
③	Programming buttons	Mode/Sim1 button – Data/Sim2 button
④	Operating mode and parameter indicator	A = Automatic mode C = Loop calibration during start-up phase S = Software version during start-up phase H = Hardware version during start-up phase t = Information about the type used during the start-up phase S = Simulation u = Inductance display E = Error 0–9 = Parameter no.
⑤	Loop symbols	① Loop 1 ② Loop 2
⑥	Operating mode indicator	A: Time function t, basic function 1–4 S: Simulation of outputs, loop inductance in µH E: 3-digit error code

3 Electrical Connections

1-Loop device
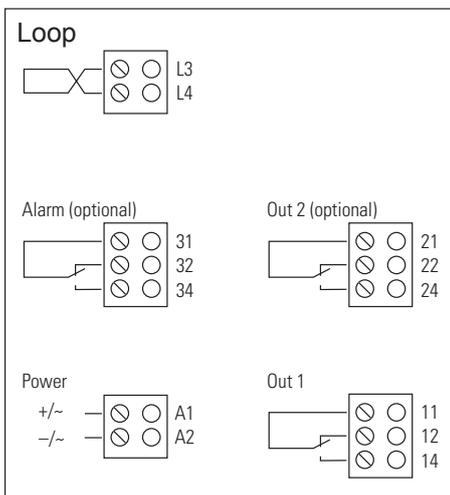
2-Loop device
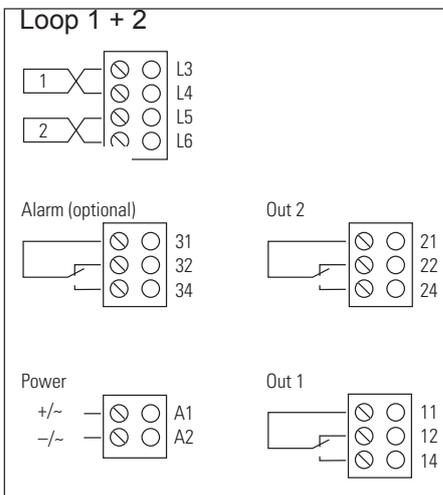
All terminal blocks are pluggable. They can be removed for connecting and maintenance.

4 Start-up

⚠ The loop must be in a non-activated condition during start up phase and adjustment

The loop detector is automatically calibrated after the operating voltage has been switched on. The start-up phase takes about 10 s. During the start-up phase, the display shows the software version (S), the hardware version (H), the device type (t) and the calibration (C) of the loop(s).

4.2   Operating mode

Following the start-up phase, the top left of the display shows the operating mode A. The loop symbol(s) are shown adjacent to that and, underneath, the set basic functions. At the bottom left, a "t" displays whether or not a time function has been programmed. Now, the function can be checked by activating the loop with the intended object. If the loop is activated, the output relay must switch on or off depending on the selected function.

Exception: "Pulse when loop exited" function.

If the loop detector does not react after the loop is activated, the sensitivity must be increased. (See "Setting the sensitivity", table 2)

The LED lights up green in operating mode A.

Activation of the loop is indicated by the corresponding loop symbol flashing.

Activation of an output is displayed by the green LED flashing.

4.3   Power failure

1. The loop is recalibrated after a power failure. If a vehicle remains stationary on the loop during the power failure, it is calibrated as well. As soon as the vehicle exits the loop, the loop must remain unoccupied for 10 seconds. Following this, the loop will once again function correctly.

2. Activate parameter 9 (Power failsafe, see table 2)

The loop is not recalibrated after a power failure. If a vehicle remains stationary on the loop, drives on it or leaves the loop during the power failure, the loop will once again function correctly without delay.

5   Programming mode

1s —
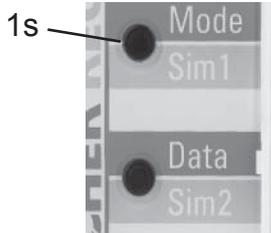
Press the "Mode" button to access programming mode. "0" appears at the top left of the display as the first parameter. Pressing again switches to the next parameter. The "Data" button enables the value of the selected parameter to be changed. See Table 2 for the settings of the various parameters.
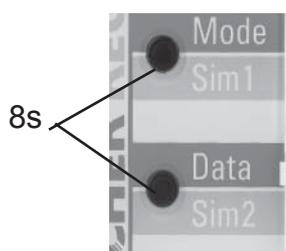
To return to automatic mode, press the "Mode" button until the letter "A" appears at the top left of the display.

5.1   Reset 1 (calibration)

2s —
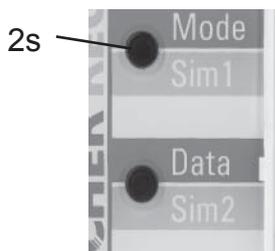
Press and hold the "Mode" button (2 s) until all segments light up in the LCD display. The loop(s) is/are recalibrated (see 4.1 Startup phase).

5.2   Reset 2 (factory setting)

 — 8s

Press and hold the "Mode" and "Data" buttons (8 s) until all segments light up in the LCD display. All values are reset to the factory settings (see Table 2). The loop(s) is/are recalibrated (see 4.1 Start-up phase).

5.3   Operating modes

Display operating mode	Designation	Remark
A	Automatic mode	Device in operation
S	simulation	Functions can be checked and the inductance of the loop(s) can be displayed
E	error	Alternating with operating mode A. Details see table 4
0-9	parameter	Pressing the Mode button once displays the next parameter. Unnecessary parameters are automatically suppressed. For example, if the time function h (hold) is selected then parameters 2 + 3 are skipped as no time delay is required. Details see table 2.

Table 1

6　Programming

Display parameter	Function	Mode	Data	Application	Remark
0	Basic function		1* 2 3 4 0	Door and gate Barrier systems Quiescent current (relay drops out when activation takes place) Direction logic (2-loop device only) Deactivate 2nd loop (2-loop device only). Only visible in the menu for the 2nd loop Output is deactivated	
1	Time function	t	h* o f	Hold (infinite time) Pulse on entry Pulse on exit On delay　call delay Off delay	Devices with two output relays: Both relays are displayed one after the other and can individually be programmed (parameter 1–3)
2	Time unit	t	c C* n h	0.1 s 1.0 s 1.0 min　relay time 1.0 h	This parameter is not displayed if parameter 1 is selected as "h" (hold)
3	Time factor	t	1–99/1*	Delay time = Time unit x Time factor	This parameter is not displayed if "h" (hold) was selected under parameter 1
4	Sensitivity	S	1–9/6*	Response sensitivity of the loop	1 low - 9 high
5	ASB (Automatic sensitivity boost)	A	0–1/0*	Automatic switchover to max. sensitivity after activation of the loop	
6	Frequency	F	1–4/4*	4 different frequencies are possible	1 low - 4 high
7	Direction logic (2-loop device only)	d	— —— — —*	Direction loop 1 to 2 Direction loop 2 to 1 Both directions	This parameter is only displayed if function 4 (Direction logic) was selected under parameter 0
8	2nd output (2-loop device only)	o	0–1/0*	Activate 2nd relay, condition basic function = 0 on the 2nd loop	Only possible with 2-loop device
9	Power failsave	P	0–1/0*	Parking Application Memory function after power failure	Automatic switchover to basic function 2. Parameter 4 is limited to 1–5
A	Back to operating mode			Press the Mode button for 2 s until A appears at the top left of the display	

Table 2　　　　　　　　　　　　　　　　　　　　* Factory setting

7　Simulation

2s
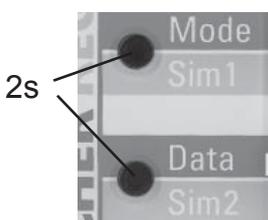
Press and hold the "SIM1" (Mode) and "SIM2" (Data) buttons at the same time (for 2 s) until the top left of the display shows the letter S.
In Simulation mode, the activation of the loop with the selected time function can be tested together with the controller.
However, it is also possible for only the outputs to be activated. Furthermore, the inductance of the loops can be displayed in this mode with an accuracy of +/-10 %. (Refer to Table 3.)
Simulation mode can be exited at any time by pressing the "SIM1" (Mode) button for 2 s

Display simulation	Designation	Sim 1	Sim 2	Remark
S	Loop activation	L	0-1	The outputs are activated with the selected time functions
S	activation of outputs	o	0-1	The outputs are switched on and off without a time function
S	alarm output activation	A	0-1	The alarm relay is switched on and off
u	inductance	Value		The inductance of the connected loop(s) is displayed in µH (+/-10%)
A	back to operating mode			Press the Mode button for 2 s until A appears at the top left of the display

Table 3

8　Error codes

If an error occurs, operating modes A and E light up alternately and an error code such as 001 is displayed (see Table 4). The LED turns red and flashes.

Display	E001	E002	E011	E012	E101	E201	E301	E302	E311	E312
Error	Interruption loop	Interruption Loop 2	Short-circuit Loop 1	Short-circuit Loop 2	Under-voltage	EPROM error	Loop 1 too large	Loop 2 too large	Loop 1 too small	Loop 2 too small

Table 4

8.1　Error memory

The last 5 errors are stored and can be interrogated via the LCD display. Briefly pressing the Data button shows the last of 5 errors on the display. Another short press switches to the error before that, and so on. When the button is pressed for the 6th time, the device switches back to automatic mode.
Pressing the Data button for 2 s deletes all error messages.

Supply voltage	24 VAC – 20 % to +10% 84 mA 24 VDC – 10 % to +20% 84 mA 94-240 VAC +/– 10% 50/60Hz 23–12mA
Power consumption	Max. 2 VA
Duty cycle	100%
Operating temperature	-20 °C to +60°C
Storage temperature	-40 °C to +70°C
Air humidity	<95% non-condensing
Loop inductance	max. 40–1000 µH, ideal 80–300 µH
Frequency range	20–100 kHz in 4 stages
Response sensitivity	9 stages 0.01 – 4.00 (frequency change in %) 9 0.01% 8 0.02% 7 0.05% 6 0.10% 5 0.20% 4 0.50% 3 1.00% 2 2.00% 1 4.00%
Hold time	Infinite or according to programming
Loop connection wiring	max. 75m 1 mm2 (AWG 15) Minimum 25 twists per metre
Loop resistance	< 8 ohm incl. connection wire
Output relay (loop)	240 VAC 2 A AC 1
Output relay (alarm)	40 VAC 0.3 A AC 1
Response time	1-loop device 150 ms 2-loop device 300 ms
Product compliance Safety	R&TTE 1999/5/EC EMV 89/336/EEC 73/23/EEC
Housing	For DIN rail mounting, polyamide material red/grey
Connection type	Plug-in terminals
Dimensions	94 x 91 x 22.5 mm (3.70 x 3.58 x 0.88'') (LxHxW)
Weight	200 g (0.44 lb)
Protection class	IP30 mounted on DIN rail

Example

Installation

Correct installation of the sensing loop will give optimum detection performance. The sensing loop is to be installed in the surface of the carriageway at the point of desired detection. This is performed by slot cutting the carriageway surface of width 0.5mm greater than the diameter of sensing loop cable to be used and a depth of n x cable diameter (in mm) +25mm minimum (where n is the number of turns 2, 3 or 4 which is dependent on the circumference of the sensing loop). The slots should be cut to the guidelines indicated below.

Cutting the corners of the rectangle at 45° helps to meet the minimum bend radius limits for the cable used. The cable from the detector to the sensing loop (feeder) should be twisted at a rate exceeding 25 turns per metre. The feeder length should not exceed 75m.
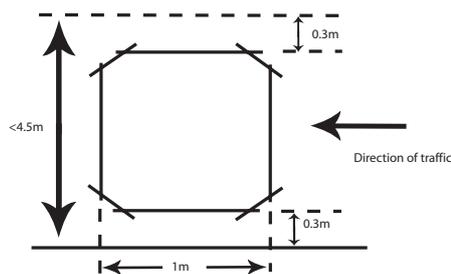
The sensing loop consists of n turns of cable indicated as follows:

Sensing loop circumference (m)	Number or turns (n)
3	8
4	6
5	5
6	4
7	3
8	3
9	3
10	2

The theoretical ideal is 24 meters of cable in the sensing loop.

The cut slot should be back filled with quick-set epoxy or hot bitumen mastic. If a second sensing loop is to be installed in the same carriageway then the separation of adjacent edges is to be a minimum of 2m for adjacent edges of lengths up to 2.5m and an extra 0.5m separation for each additional 1m length thereafter. Care should be taken not to trap water in the slot during back filling as this may lead to unstable detection performance.

Example
To set detector as free exit loop for barrier with 2 second pulse on entry with medium low frequency and medium sensitivity.
1. Press mode button for 1 sec and select function 0
2. Press data and select no. 2 (barrier systems)
3. Press mode button and select function 1
4. Press data button and select pulse on entry (⌐)
5. Press mode and select function 2
6. Press data and select 1 second (⊏)
7. Press mode and select function 3
8. Press data and select time factor 2 (2x1sec)
9. Press mode and select function 4
10. Press data and select sensitivity (S6)
11. Press mode button twice and select function 6
12. Press data button and select frequency 2 (med low)
13. Press mode button 4 times to exit programming

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