FLUX 11
POCKET INSTALLATION MANUAL

Centurion Systems (Pty) Ltd

1. Introduction

The **FLUX 11** is a single channel plug-in inductive loop detector designed for vehicle access applications, and interfaces seamlessly with the standard loop detector 11-pin bases found in the majority of vehicle access systems. The detector is responsive, highly sensitive, and utilises sophisticated software algorithms which adapt to prevent false triggering due to changing environmental conditions. Easy to use dipswitches, as well as visual and audible feedback of loop operation, ensure a hassle-free installation experience. Provision is made for both a Pulse and a Presence output, enabling the installer to connect a free-exit as well as a closing (or safety) loop using a single loop detector base.

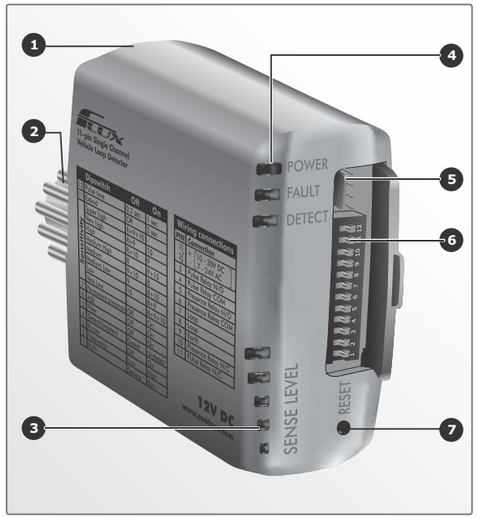
In addition, the **FLUX 11** is available in both a low-voltage, energy efficient 12V DC variant as well as a powerful 230V AC model, making it an extremely versatile access control solution and eliminating the need for expensive transformers or time-consuming rewiring.

Typical uses include free exit loops, safety loops, closing loops for traffic barriers, arming loops for access control equipment, and general vehicle sensing applications.

IMPORTANT
Safety Instructions

1. All installation, repair, and service work to this product must be carried out by a suitably qualified person.
2. Do not in any way modify the components of the system.
3. Do not install this product near sensitive electrical components (e.g. the DOSS sensor inside the gate operator housing).
4. Do not install the equipment in an explosive atmosphere: The presence of flammable gas or fumes is a serious danger to safety.
5. Before attempting any work on the system, cut electrical power and disconnect the batteries.
6. Do not leave packing materials (plastic, polystyrene, etc.) within reach of children, as such materials are potential sources of danger.
7. Dispose of all waste products like packaging materials, etc., according to local regulations.
8. CENTSYS does not accept any liability caused by improper use of the product, or for use other than that for which the system was intended.
9. This product was designed and built strictly for the use indicated in this documentation. Any other use, not expressly indicated here, could compromise the service life/operation of the product and/or be a source of danger.
10. Anything not expressly specified in these instructions is not permitted.

2. Product identification



1. **FLUX 11** housing
2. 11 pin connector
3. Sensitivity level indicator LEDs
4. Diagnostic LEDs
5. Bootloader header
6. Dipswitches
7. Reset button

3. Technical specifications

Supply voltage:	
12V DC Model	10 - 40V DC
	7 - 28V AC
230VAC Model	220-240V AC +-10% 50Hz
Standby current:	
12V DC Model	10mA
230VAC model	<10mA
Output relay rating:	1A @ 125V AC
Detection time:	4ms @ 100kHz loop frequency
	10ms @ 40kHz loop frequency
Indicators:	
Visual	LED indicators showing Power, Loop Fault, Loop detection level (5 LEDs), Detect
Audible	Buzzer with indication of loop detection level and loop fault
Detector tuning range:	15 - 1500 uH.
Protection:	Isolation transformer with 10kA lightning protection
Connectors:	11 Pin base
Dimensions:	95.5mm (long) x 41.5mm (wide) x 80mm (high)
Mass:	
12V DC Model	92 grams
230VAC model	182 grams
IP rating:	IP50

4. Standard features of the detector

Reset Button	Pressing the reset button enables the detector to be manually reset at any time. This results in the detector re-tuning the sensing loop and becoming ready for vehicle detection. In addition, a 0.5s output pulse will be generated.

Dipswitches

Run Switch	If this switch is ON, the detector is in Run Mode, and functions normally. If OFF, the detector halts, and the output relay defaults to the detected state. This is useful when working on a traffic barrier, as it will prevent the barrier from lowering.
Frequency Selection Switch	The frequency of the loop is determined by the inductance of the loop and the frequency switch setting. If the frequency switch is on, the frequency is reduced by approximately 25%. It may be necessary to change the frequency to prevent cross-talk between adjacent loops.
Buzzer Enable Switch	Controls the audible indicator – a useful diagnostic tool when setting up the loop
Detect/ Undetect Switch	If pulsed output is selected, this switch configures the output pulse to be generated when the vehicle is either detected (enters the loop), or undetected (exits the loop).
Filter Switch	This switch enables a delay of two seconds between detection of the vehicle and switching of the output. This delay is normally used to prevent false detection of fast-moving objects.
Automatic Sensitivity Boost (ASB) Switch	This option increases the sensitivity of the detector after initial detection of a vehicle. This is useful to reliably detect vehicle and trailer combinations. Sensitivity returns to the selected value once the vehicle has been undetected.
Permanent Presence Switch	If selected together with Presence Output, the output will remain active as long as a vehicle remains on the loop. The danger of using this setting is that any change in the environment (for example the introduction of metal into the vicinity of the loop) will not automatically be tuned out without pressing the reset button. If not selected, the loop will automatically tune out any permanent detection after five minutes.
Adjustable Loop Sensitivity Switches	Eight sensitivity settings are available

Sensitivity	DIP 8	DIP 9	DIP 10
Super high	OFF	OFF	OFF
Very High	OFF	OFF	ON
High	OFF	ON	OFF
Medium High	OFF	ON	ON
Medium	ON	OFF	OFF
Medium Low	ON	OFF	ON
Low	ON	ON	OFF
Very Low	ON	ON	ON

Extend switch	This switch, when enabled, extends the time that the Presence relay remains activated by an additional two seconds after a vehicle has left the loop.
Pulse Time	This switch sets the time for which the Pulse relay will remain energised after it has been activated. If the switch is set to the OFF position, the pulse time will be 0.2 seconds and, if the switch is set to ON, the pulse time will be one second.

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DOC: 1184.D.01.0002_09072018
SAP: DOC1184D02

LED indicators

Power Indicator LED	This red LED is on when power is present, and the controller is functioning.
Loop Fault Indicator LED	This red LED is illuminated when there is a loop fault. If the loop is open circuit, the Fault LED will flash continuously. If the loop is short circuit, it will remain on.
Detection Level Indicator LEDs	These five red LEDs provide a visual indication of the Detection Level. Once all five LEDs are on, the detection threshold is almost reached. This is a very useful feature to determine if the loop is going to perform reliably. With no vehicle in the vicinity, all the LEDs should be off.
Detect Indicator LED	This green LED Indicator is illuminated when there is a vehicle detected. This LED can also be used to determine the loop frequency. Reset or power up, count the number of times the Detect LED flashes. Multiply this number by 10KHz. For example: if the LED flashes eight times, then the loop frequency is approximately 80KHz

5. Relay functionality

The relays will behave according to the tables below.

Presence relay functionality

	Vehicle detected	No vehicle detected	Loop faulty	Power off
N/O	Closed	Open	Closed	Closed
N/C	Open	Closed	Open	Open

Pulse relay functionality

	Dipswitch 4	Vehicle detected	No vehicle detected	Loop faulty	Power off
N/O	Detect	Pulse Closed		Open	Open
N/O	Undetect		Pulse Closed	Open	Open
N/C	Detect	Pulse Open		Closed	Closed
N/C	Undetect		Pulse Open	Closed	Closed

6. Tips for a successful loop installation

1. The **FLUX 11** should be installed in a weatherproof location, such as the inside of a traffic barrier, as close to the loop as possible.
2. The loop and feeder should be constructed from XLPE (cross-linked polyethylene) insulated multi-stranded copper wire with a minimum cross-sectional area of 1.5mm^2. The feeder should be twisted at a rate of at least 20 turns per metre to improve reliability (Remember that twisting the feeder will shorten its length, so ensure a long enough feeder wire is used). Feeders which may pick up electrical noise should use screened cable, with the screen earthed at the detector.
3. Joints in the wire are not recommended, but where required must be soldered and made waterproof.

Faulty joints will lead to unreliable operation.

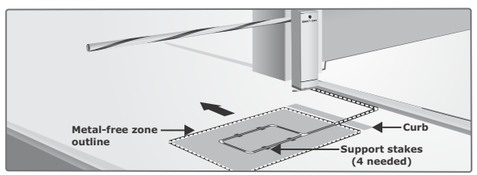
4. The loop should be either square or rectangular in shape with a minimum distance of 1m between opposite sides.
5. Two to six turns of wire are typically used in the loop – see table below.

Loop perimeter (metres)	Number of turns
3 - 4	6
4 - 6	5
6 - 10	4
10 - 20	3
>20	2

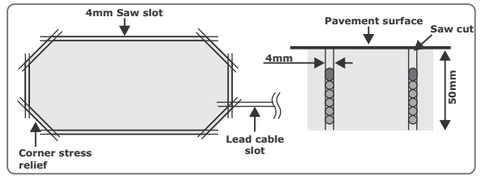
6. When two loops are laid in close proximity to each other, it is recommended that different numbers of turns are used in each loop to prevent cross-talk.
7. Cross-talk describes the interference between two adjacent loops, and can cause reliability issues.

To minimize cross-talk, adjacent loops should be at least two metres apart, and on different frequency settings

8. The most reliable form of loop is preformed and enclosed in conduit. This prevents water ingress, and minimizes the effects of vibration.



9. Where a pre-formed loop is not practical, slots should be cut into the road using a masonry cutting tool. A 45° cut should be made across the corners to prevent damage to the wire on the corners. The slot should be about 4mm wide and 30mm to 50mm deep. Remember to extend the slot from one of the corners to the roadside to accommodate the feeder. After the loop and feeder wires have been placed in the slot, the slot must be filled with an epoxy compound or bitumen filler.



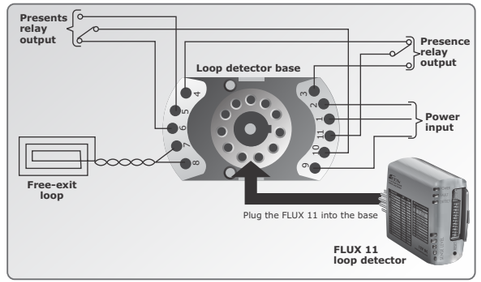
7. Mounting instructions

The housing of the **FLUX 11** is not weatherproof, and it should not be mounted externally.

Simply insert the **FLUX 11** into the 11 pin base of the access control device.

8. Electrical setup

1. **Ensure that all low voltage systems (less than 42.4V) are suitably protected from damage, by disconnecting all sources of power such as chargers and batteries before doing any work.**
2. **All electrical work must be carried out according to the requirements of all applicable local electrical codes.(It is recommended that a licensed electrical contractor perform such work.)**



9. Commissioning the system

1. With the loop connected, apply power to the **FLUX 11**
2. The red Power LED will light up, and the green Detect LED will flash until the loop has stabilized, and then turn off.
3. If the buzzer is enabled, it will sound continuously during this period.
4. Once the loop has stabilized, only the red Power LED should be on.
5. Bring a metal object towards the loop, and the Sense level LEDs will begin to light up, indicating the detection range of the loop.
6. Once all five lights have lit up, the unit will enter detect, with the green Detect LED lit.
7. If the buzzer is enabled, a variable tone will indicate the sense level, and change to a continuous tone once the unit has detected.
8. Configure the desired operational settings using the Dipswitches (open the access flap to access the Dipswitches).
9. Test the **FLUX 11** using a metallic object, or a vehicle.

10. Diagnostics

Symptom	Possible cause	Solution
The power LED is not on	No power supply voltage on the input.	Check that the power supply is correctly wired to the detector.
The sense Level LEDs flash erratically	There may be a poor connection in the loop or loop feeder.	Check all wiring. Tighten screw terminals. Check for broken wires.
	The detector may be experiencing crosstalk with the loop of an adjacent detector.	Try changing frequencies using the frequency switch. Put the detector with the larger loop onto low frequency and the detector with the smaller loop onto high frequency.
The detector randomly detects, even though there is no vehicle present	Faulty loop or loop feeder wiring.	Check the wiring. Tighten screw terminals. Check for pinched or bent wires. Is the feeder wire twisted?
	Movement of the loop in the ground.	Check for cracks in the road surface near the loop.
The Loop Fault LED is flashing, and an audible tone is heard – two short tones, one long tone	The loop inductance is too large, or the loop is open circuit.	Check that there is electrical continuity on the loop. If the loop inductance is too large then try reducing the number of turns.
The Loop Fault LED is permanently illuminated, and an audible tone is heard – one short tone, one long tone	The loop inductance is too small, or the loop is short circuited.	Check that there is no short circuit on the loop feeder wiring or the loop. If there is no short circuit then the inductance is too small and more turns of wire should be added to the loop.