

# Configurable DOUT patterns

## Introduction

Configurable DOUT patterns can be used with Geofencing feature. It makes DOUT configuration much more flexible and gives users an ability to configure it according to their needs.

Feature was first introduced to FM devices with these firmware versions:

- FM-Tco4 HCV - 00.02.23.08
- FM-Tco4 LCV - 00.02.23.08
- FM-Pro4 - 00.02.23.08
- FM-Eco4/4+ and FM-Eco4 light/light+ - 00.01.20.10

You can get the latest firmware and configurator from our documentation website: [doc.ruptela.it](http://doc.ruptela.it)

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## Document change log

Date	Version	Change details
2016-10-26	1.0	Initial draft.
2016-11-18	1.1	Feature available for the FM-Eco4/4+ and FM-Eco4 light/light+.

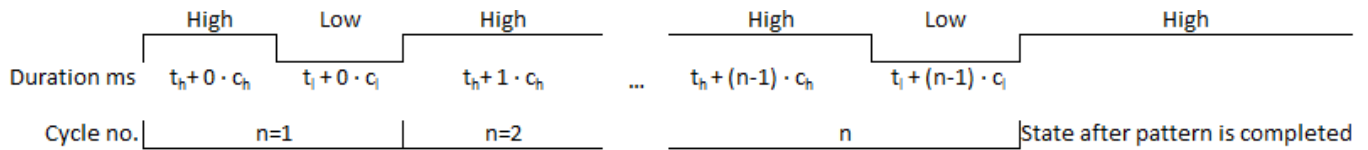
## Description

Configurable DOUT patterns can be used only together with the Geofencing feature. It works on one DOUT at a time.

Pattern itself is defined by the "Pattern parameters". There are six of them.

### Pattern parameters

- $t_h$  – duration of the high pulse in milliseconds. Min value 1ms, max value 10000ms.
- $t_l$  – duration of the low pulse in milliseconds. Min value 1ms, max value 10000ms.
- $c_h$  – constant, which increments every high pulse duration. Value in milliseconds. Can be negative number, in which case the pulse duration is decreased. Min value -10000, max value 10000.
- $c_l$  – constant, which increments every low pulse duration. Value in milliseconds. Can be negative number, in which case the pulse duration is decreased. Min value -10000, max value 10000.
- $n$  – number of cycles. Min value 1, max value 10000.
- **State** – final state for the DOUT. DOUT will remain in this state after the pattern is completed. This can be high – H or low - L.



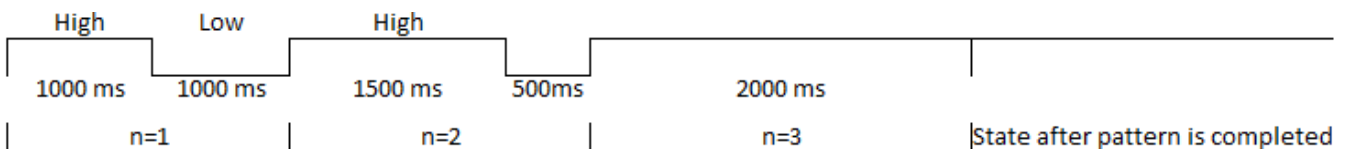
### Pattern parameters in the configurator

Pattern parameters field is divided into six sections – one for each pattern parameter. Sections are separated by the semicolon punctuation marks. Starting from the right, parameters match each field in the following order:  $t_h$ ;  $t_l$ ;  $c_h$ ;  $c_l$ ;  $n$ ; **State**.



### Pattern examples

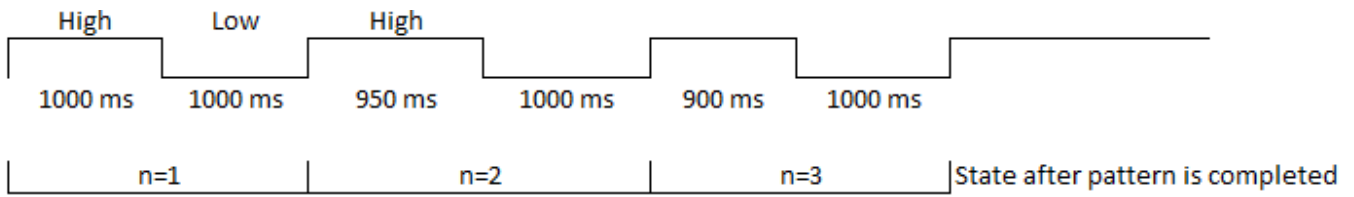
Pattern parameters:  $t_h = 1000$ ,  $t_l = 1000$ ,  $c_h = 500$ ,  $c_l = -500$ ,  $n=3$  and state = H.



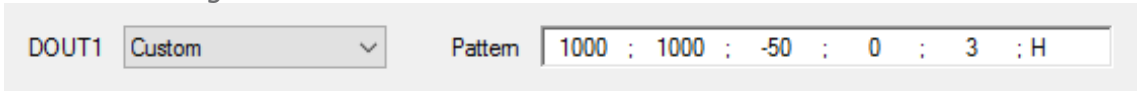
This pattern in the configurator:



Pattern parameters:  $t_h = 1000$ ,  $t_l = 1000$ ,  $c_h = -50$ ,  $c_l = 0$ ,  $n=3$  and state = H.



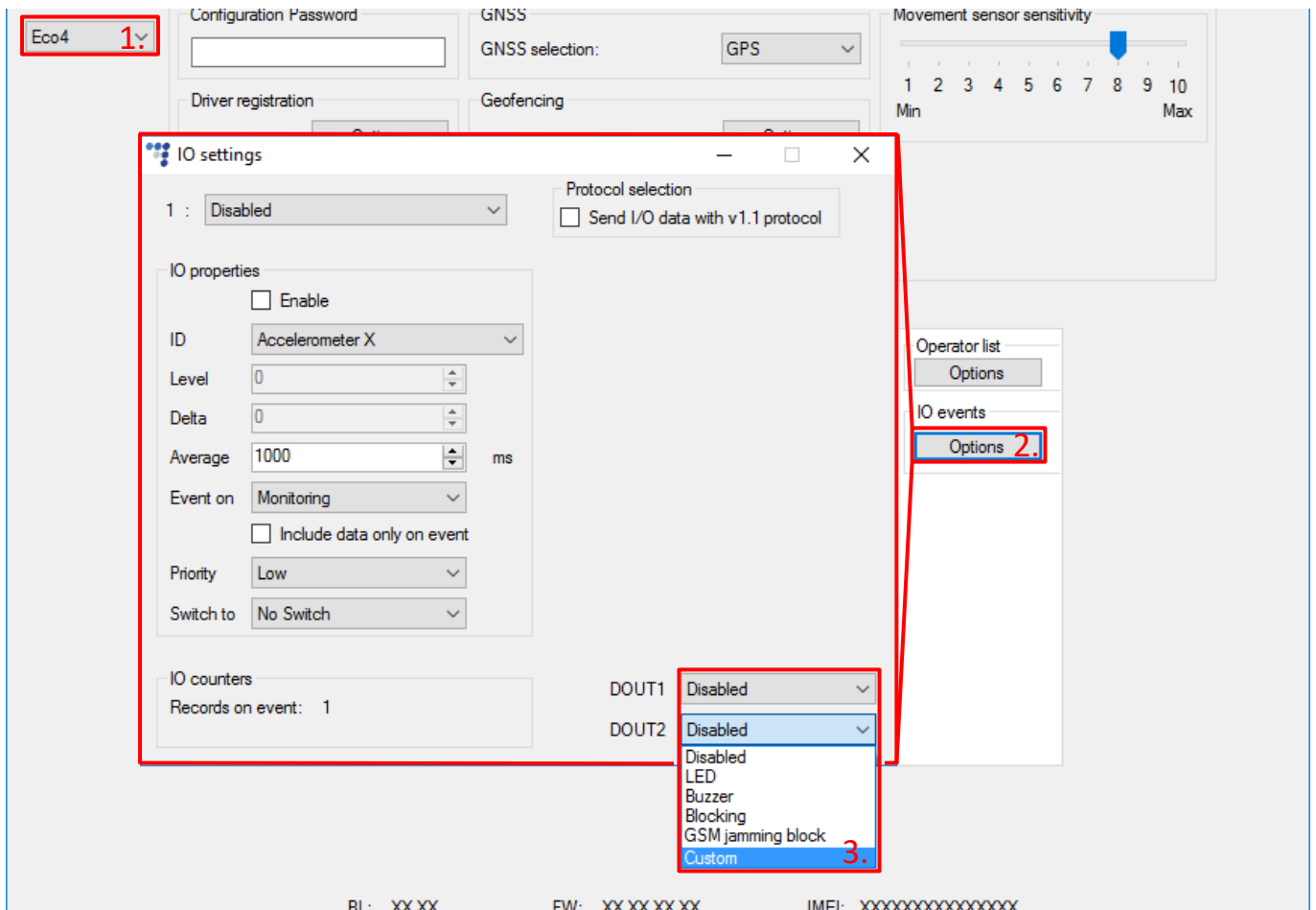
This pattern in the configurator:



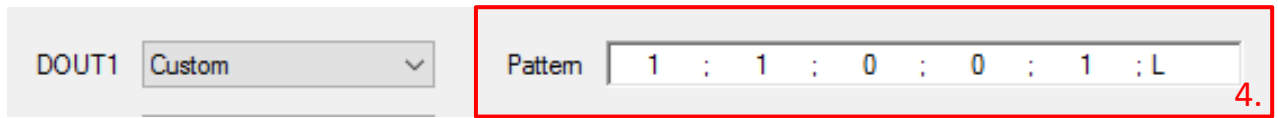
## Configuration

### Set DOUT pattern parameters

1. In the main configurator window choose your device (*Eco4*, *Tco4 LCV*, *Tco4 HCV*, *Pro4*).
2. In the **I/O events** section click on the "Options" button. It opens up a new "I/O settings" window, here you can enable or disable I/O parameters.
3. In the bottom right corner choose one of the DOUTs. In its dropdown menu select *Custom*. **Pattern** field will be displayed below.



4. Enter the pattern parameters in the **Pattern** field.



### Enable DOUT in Geofencing options

- 5. Under **Global** settings, in the **Geofencing** section click on the "Options" button. It opens up a new geozones settings popup window.
- 6. Geozones configuration options are described in "EN Internal geozones.pdf" document available here: [link](#). After geozones configuration at least one **Output channel** drop down list on the right should be active. Select *Custom* to activate your DOUT pattern.

