
EBRAX
ATM SECURITY LLC

The anti-skimming kit is a security device installed in ATMs.

The objective of the kit is to protect the cashier from fraud attempts by cloning magnetic cards.

When a fraud attempt is detected, through a capacitive sensor, the kit sends an alarm signal and activates an electromagnetic
transducer, affecting the operation of the fraud.

In 2018, the development of a new capacitive sensor version was completed, with some advantages and improvements compared to the old version.
Below is a comparison between the versions.

	Generation I	Generation II
Sensor		
Detection technology	Capacitive	Capacitive
Supply voltage	12V/24V	12V/24V
Antenna Connection	SMA / Welding Connector	SMA connector
Status LED	Yes	Yes
Compatibility	KIT EBX 1032 KIT EBX 1033	KIT EBX 1032 KIT EBX 1033
Monitored Areas	01	Up to 10
Activation Level	Permanent	Variable
Sensitivity Level	✡ ✡ ✡	✡ ✡ ✡ ✡

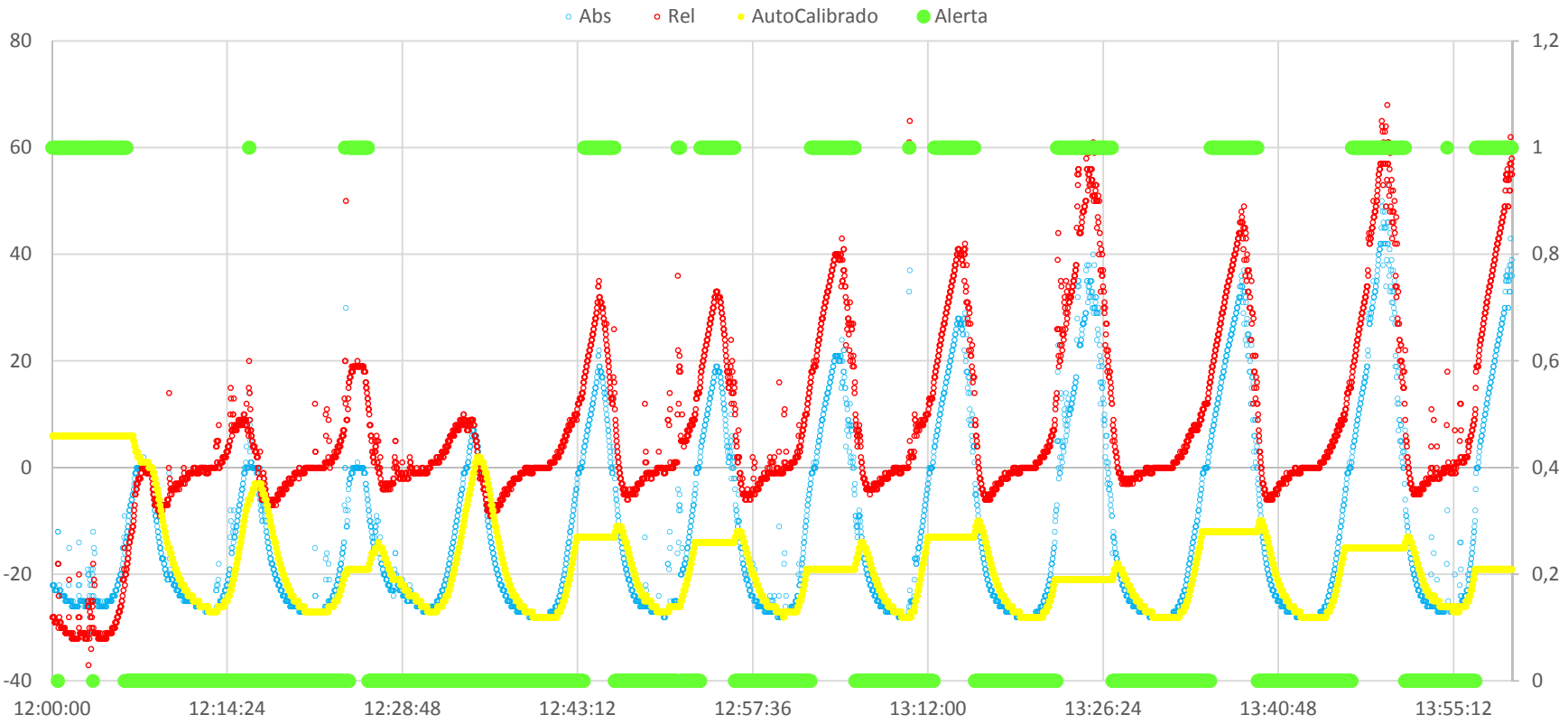
We were informed that a large number of ATMs presented false alarm events after updating the sensors for the G2 version.

With the help of a Logger device connected to the sensor, it was possible to record the behavior of the sensor after hours, to
look for some abnormal and out of expected behavior.

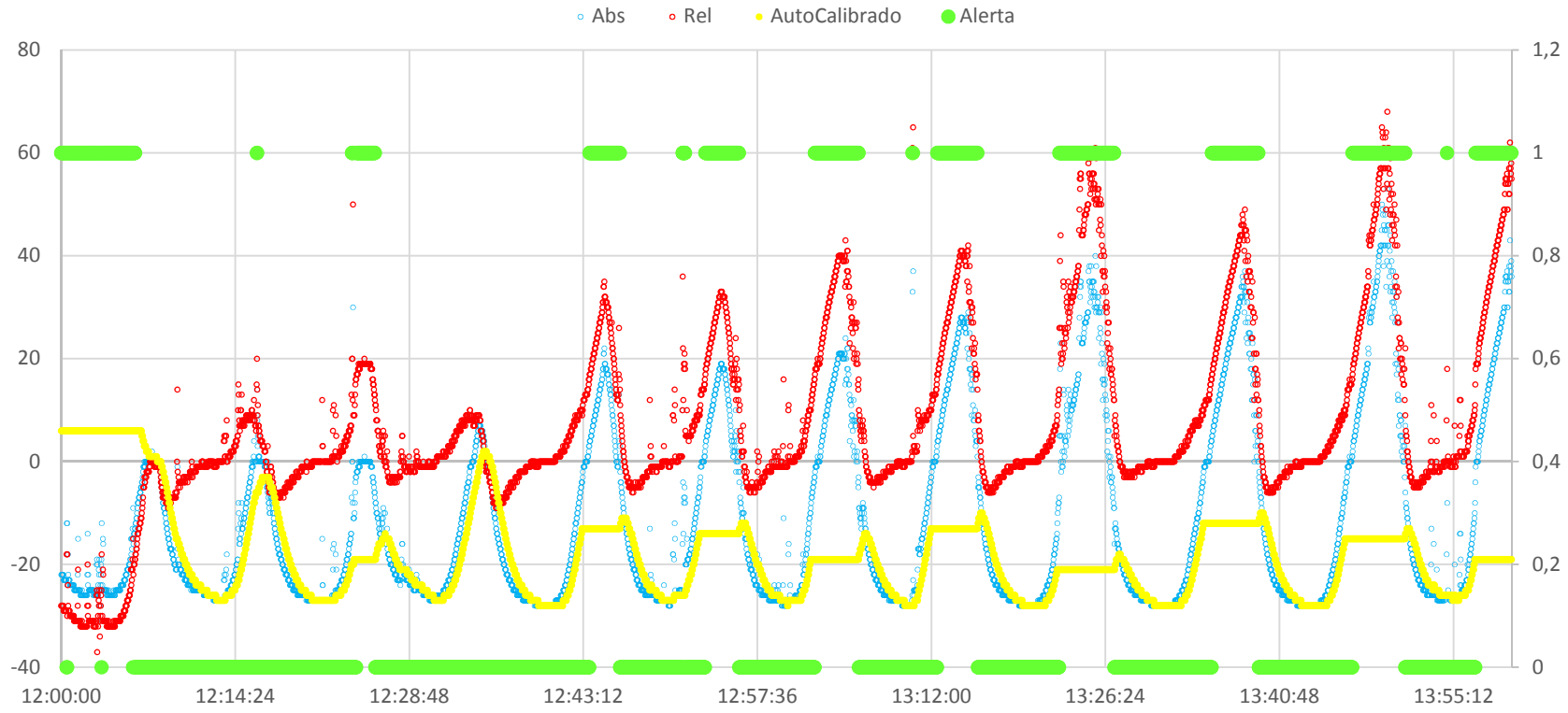
This analysis was initially carried out at the ATM Tesai CDE, on the 25/09. This cashier had many daily activations,
achieving a maximum stability period of 1 hour.

The graph below illustrates the behavior of the sensor over a period of two hours.

Under ideal conditions, the yellow line (AutoCalibration) should always be close to the blue line (Absolute Value of the sensor).
The red line (Activation Value), is the difference between these two values.
The sensor is activated whenever the Activation Value reaches 18 points.

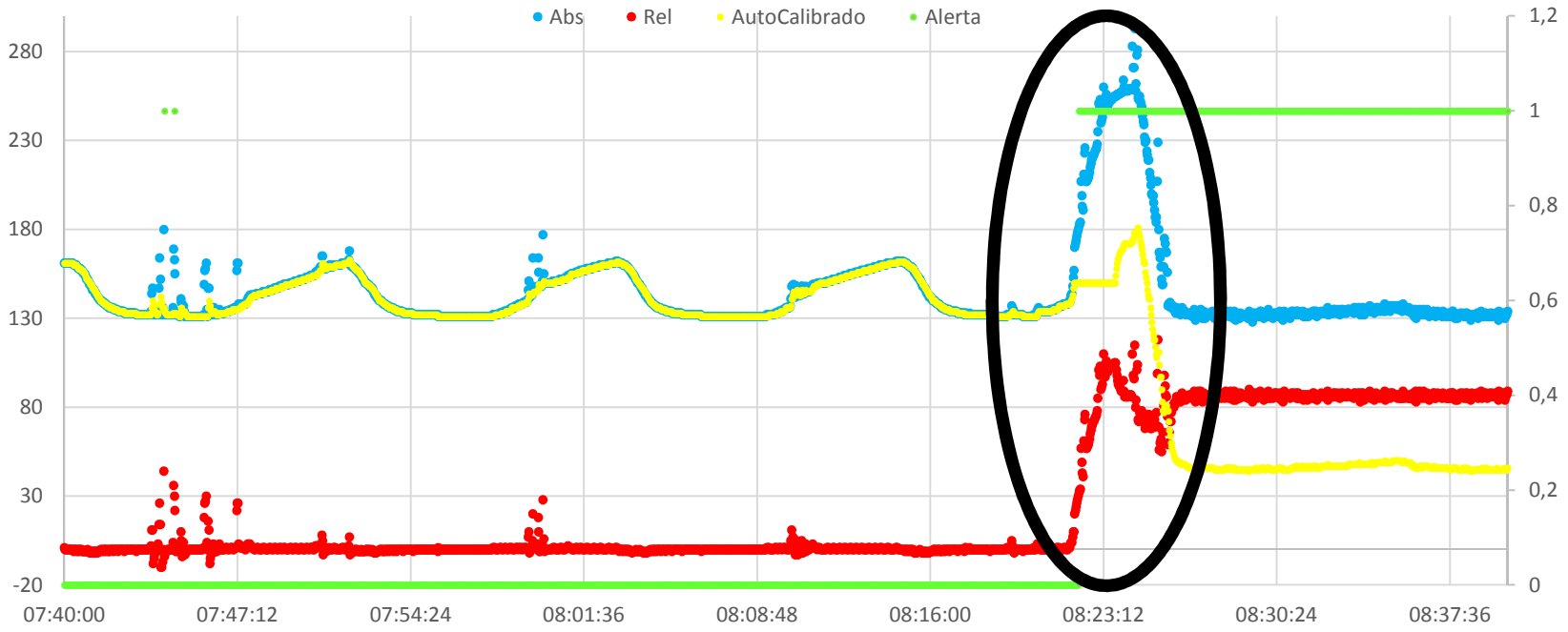


In this analysis, it was found that the variation of the blue line was very fast (many variation points in a few seconds), moving away from AutoCalibration (yellow line).
The standard AutoCalibrate speed was not sufficient to maintain the Absolute Value of the sensor and the AutoCalibrate value equal.
Based on the information of this cashier, a change in the sensor parameters was made, so that the AutoCalibrado is faster.
On 01/10 and 02/10, this version was implemented with parameter changes (FW1.1) in 6 ATMs, including the CDE ATM.
This ATM, which previously had a maximum stability period of 1 hour, remained 24 hours running, until the first false alarm event.



Analyzing this new event on 03/10, we found a new great variation (highlighted in the graph below).

Based on this, a second version (FW1.2) was generated, with a faster AutoCalibrate speed, higher AutoCalibrate operating range and higher sampling rate.

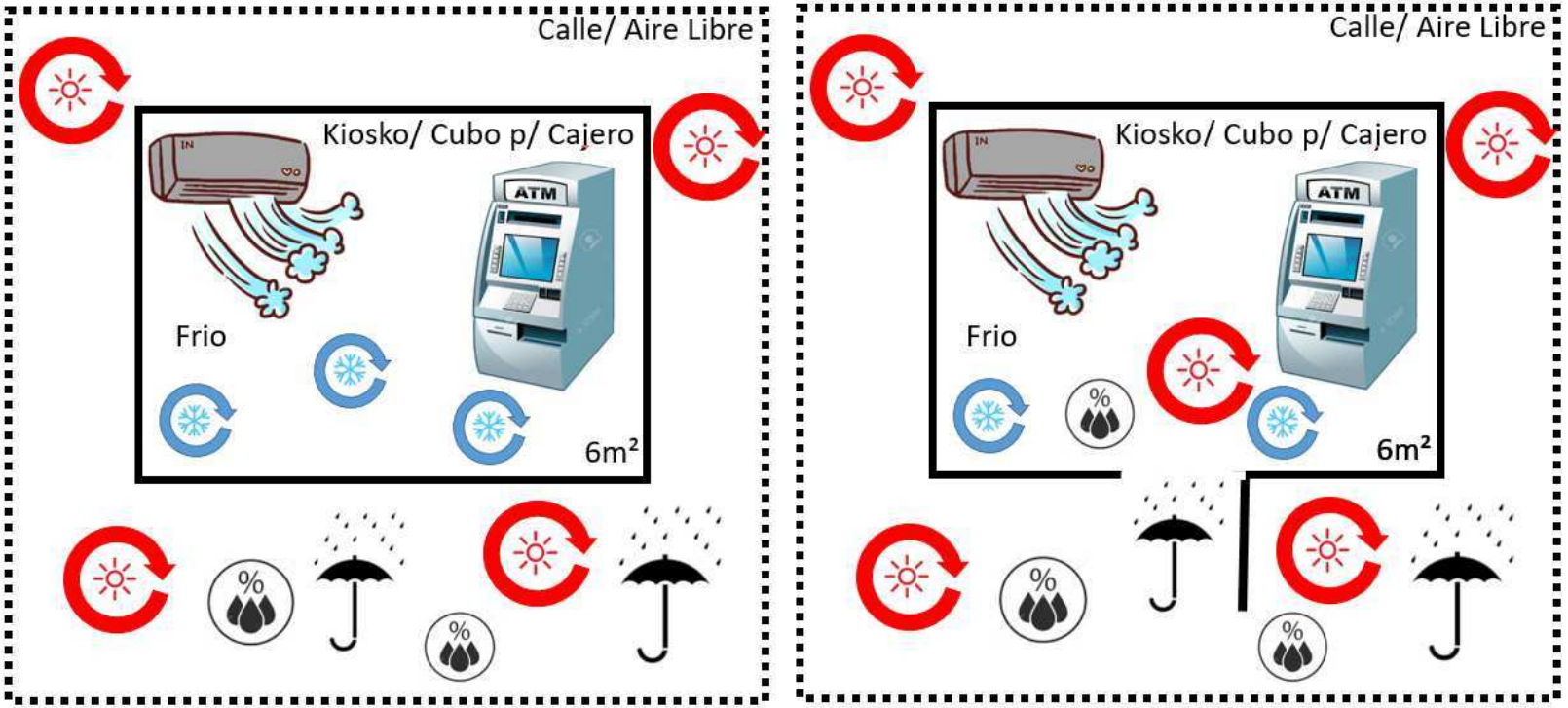


This version of FW1.2 was updated in the equipment in warehouse and will be implemented in production ATMs on 08/10
and 09/10.

These ATMs will be monitored until next Friday 12/10 and then begin updating large-scale sensors.

Evaluating the ATM environment, we find that all ATMs are in air-conditioned environments with air conditioning. But around the cashier, it is subject to weathering.
The photo below shows water condensation on the surface of the cashier's room.
This means that the interior is cold and the exterior very humid.

The figure below details the conditions that generate variations in sensor behavior.
Under normal conditions, with the cashier's room closed, the sensor environment is cold and dry, due to the conditioned air.
When opening the door, a hello of heat / humidity, advances on the cashier, causing that there is a large and rapid variation in the environment monitored by the sensor.



The version I of the sensor is less susceptible to these great changes because the activation levels are different.

Version I needs a big change in the values to be activated (less sensitive).

There are even more parameters in Generation II of the sensor that can be adjusted:

- Leave it more or less sensitive;
- AutoCalibrate more or less fast;
- Sampling rate more or less fast (less accumulation of changes);
- And others.