# Neolec

## Driving Behavior Analyzer

( DBA -100V01)

What is DBA ?

DBA System Structure

Why DBA ?

What Does DBA Provide ?

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# Forewords

According to the statistics released from WHO(World Health Organization) shows 1.25M people were killed by the road traffic accident, and more than 50% of those victum were vulnerable road users → Pedestrian.

In the past, there is No Active eqipment available to detect and alert the dangerous situation in advance or in time, only passive device such as driving recorder to clarify responsibility after accident arised.

Mobileye(An Israeli company merged by Intel on Mar. 2017) is the first company to provide collision warning system and being the leader of autonomous driving technology in the world today. By usinng Mobileye Collision Warnninng System, 99% of tailinng accident can be avoided, simply because of its precise image recognition technoogy which will alert the driver when there is a potential collision was detected.

Mobileye system provides not only an instant alert(visual or audio) to the driver, but also output the details of event to the FMS(Fleet Management System) via telematics. However, all these datas represents only the result, its just like the tachograph and GPS tracker recording only results.

Neolec decided to explore further → Driving Behavior Analysis !

To prevent from dangerours event by analyzing certain driving behaviors observed.

# System Structure

The DBA system is based on the output signals(contain massive event datas) from Mobileye Collision Warning System, by analyzing the data, defining the driving behavior pattern, responding with immediate notice to the fleet or drivers manager in order to avoid or mitigate the damage of crashes.

- **Alert of "immediate dangerous driving behavior" data 888 :**
  When the data analyzed meets definition of "dangerous driving pattern", an 888 alert will be sent to the manager via 3/4G network to its cell phone or any other portable device.

- **All time transmit、record of every single alert signal data 999 :**
  By setting the parameters, fleet manager will be able to define the driving behavior standard or pattern which is appropriate or not, it can be even much convinced if the DVR is connected.

- **System Diagnostics :**
  The system will automatically self check when the vehicle is power ON and send signal every minutes even no event reported. Or if the system can not detect any image signal, an error message will be sent to the FMS within 10 minutes. If the driver dis-connect the power line or signal line, the system will also send an error code to the FMS center via telematics.

# Neolec "Drivinng Behavior Analyzer" System Structure

**Mobileye Collision Prevention System**

Output signals
- Vehicle info : brake/speed/left、right direction light
- LDW Lane Departure Warning
- FCW Forward Collision warninng
- HMW Headway Monitoring & warning
- SLI Speed Limit Idetification

**DBA**

世環國際 Neolec
駕駛行為分析器
型號：DBA-100V01

CAN Bus

Driving behavior analyzing

FMS data center or cloud storage and monitoring.

Data 999

3G/4G

Data 888

**Telematics**

車機
3G/4G 模組

RS 232
Bluetooth

# DBA (Driving Behavior Analyzer) Provides



世環國際 Neolec
駕駛行為分析器
型號：DBA-100V01

Vcc
CAN
RS232
F/W
Update

### Data 999 (6 alerts）
The alerts will be sent to the data center or cloud server to restore and generate report for management reference。

### Data 888 (5 instant alerts）
According to the preset parameters and definition of "Dangerous Pattern" ,the alert will be sent instantly while the conditions are matched。This alert will allow the manager to take immediate action(such as call the driver) to prevent any potential danger happened.

### Data 700/760
Mobileye Raw Data， provide basic vehicle info to allow 3rd party develop other applications, most popular one is connected to DVR to capture image before and after the alert happened。

# DBA System Functions (1)

■ Instant Dangerous Driving Behavior Alert (Data 888)

When the alerts siganl analyzed meets the preset definition of "Dangerous Driving Behavior", DBA will immediately send an alert ( with immediate video pop up if DVR is integrated ) to the assigned manager.

(1) Multiple LDW within short period → Doze(Fatigue Driving)、Distraction(using phone)
- For ex. 3 LDWs within 1 minute or 5 LDWs within 2 minutes

(2) Multiple lane changing within short period → Rush in time by weaving in and out of traffic
- For ex. 5 lane changings within 2 minutes while speed over 35Km/h

(3) Long period without safety tailing distance → Without keeping safety tailing distance
- For ex. When speed over 30Km/h, safety tailing distance less than 1.2 sec. last for more than 20 sec. ; if the HMW alert activate due to cut in, the 888 alert will be activated whenn the duration last for more than 30 sec., 888 instant danngerous alert will be sent to the FMS or assigned personnnel.

(4) Safety tailing distance less than minimum setting.→ Tailgate on purpose
- For ex.  When speed over 30K/h, HMW shows less than 0.6 sec. For 10 seconds, or less than 0.4 sec. For more than 5 seconds, 888 instant danngerous allert will be sent.

(5) Improper tailing distance or lane changing causing FCW alert → Improper overtake、dangerous driving
- For ex. When speed over 30Km/h and HMW less thann 1.2 sec., the driver trying to overtake front car but causing FCW when change to other lane, 888 dangerous driving alert will be sent.

# ➕DBA System Functions(2)

■ **All time Transmit、Record every alert signal (Data 999)**
The DBA system will record every alert in the remote server or cloud server through 3G/4G telematics.

### (1) LDW(Lanne Departure Warning)

When speed over 35Km/h, the vehicle tire press to the lane line without activating direction light, an instant alert(audio and visual) to the driver will be activated and the alert will be sent to the FMS or cloud server for recording.

### (2) HMW(Headway Monitoring Warning)

- When speed over 30Km/h, if tailing distance less than 1.4 sec.(adjustable), an instant alert(audio and visual) to the driver will be activated and the alert will be send to the FMS or cloud server for recording.

- DBA will distinguish different type of HMW :
  a. Alert caused by driver inappropriate tailing distance．
  b. Alert caused by other vehicle cut in(overtake from other driving lane).

### (3) FCW

When speed over 30Km/h, Mobileye system detects collision will happen within 2.7 sec.，．

### (4) UFCW

When speed below 30 Km/h, Mobileye system detects collision will happen within 2.7 sec. or the tailing distance less than 2 meters and continue getting closer.

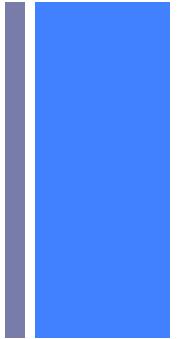# DBA System Functions(2-1)

(5) PCW

    When speed below 50 Km/h, Mobileye system detects collision to a pedestrian within 2.0 sec., an instant alert(audio and visual) to the driver will be activated and the alert will be sent to the FMS or cloud server for recording. This feature is only available during day time.

(6) Rapid acceleration and deceleration

    DBA will measure the vehicle speed variation, if variation exceeds +6Km/h and -15Km/h, an instant alert(audio and visual) to the driver will be activated and the alert will be sent to the FMS or cloud server for recording.

# Mobileye System Functions(3)

## ■ Diagnostic (Data 700)

The Mobileye system provides self-diagnostic feature alll time as long as the vehicle power on. Any of below status detected, an alert will sent to the FMS or cloud server for recordinng. → This Diagnnostic will not give any alert to the driver.

(1) Mobileye system disconnected(driver cut the wire) or any function abnormal.
(2) Mobileye system camera was masked and system detects no image.
(3) Due to environmental factor(strong light、rain drops), Mobileye system can not recognize the image.

## ■ Parameters Lock Up

Based on FMS requirement, the Mobileye system and DBA system preset parameters will b elocked up to ensure the system functionin appropriate.(Prevent from driver dilapidation of system)

(1) Power on locked up, the driver can not turn off the Mobileye system or the DBA system.

(2) Pre-settings Locked up, every parameters(audio volume、HMW distance、SLI) is locked up by Mobileye installation software.