



## Digital Transformation

MAN Truck & Bus México

Since 2009, didcom has developed and improved a telemetry and fleet management solution, aimed at the bus and truck sector, which is distinguished by being multi-brand with the main objective of standardizing fleet operation, regardless of the manufacturer.

As of 2014, MAN Truck & Bus México made available to its customers didcom technology as an “aftermarket” solution available for a certain range of its units, which allowed it to establish a joint working relationship, to identify and solve needs specific, which required the development of various products at the Hardware and Software level that had the main functionality to monitor the operation in detail and act autonomously in case of an operation outside the optimal ranges.

*“We had to know deeply the structure and electronic configuration of the manufacturer, to later determine the methodology and logic of interaction Hardware and Software”*



Camiones  
Autobuses

### About the client

With more than a decade of presence in the Mexican market, the brands MAN and Volkswagen Trucks and Buses offer the best freight and passenger transport solutions in Mexico, with advanced technology in their engines and innovation in operator safety, making them more efficient in The market and environmental friendly.

MAN Truck & Bus Mexico has an assembly plant in the city of Santiago de Querétaro with an area of 18,720 m2, whose production area is 11,500 m2. In it, more than 16 models of the Volkswagen brand are assembled, which has logistic characteristics that make it very productive. It also has the talent and commitment of its employees, always busy in the safety of its customers and in the quality of its products.

The main objective of MAN Truck & Bus Mexico is to provide transport solutions tailored to the needs of its customers with the best quality and price, offering the most innovative technological advances, thus providing added value to the vehicles that customers identify and value.

The development of this solution required the collaboration of the different technological areas of didcom at each stage of the process, since the products to be developed would have functional, physical and logical interaction with the technology of the manufacturer MAN Truck & Bus Mexico. This implied that we had to know deeply the structure and electronic configuration of the manufacturer, to later determine the methodology and logic of interaction at different technological levels, having as main objective not to generate any type of intrusion or affectation in the operation of the vehicle.

*"This solution would be the proposal of digital transformation and offer of telematic services of MAN Truck & Bus Mexico for the Mexican market"*

In the same way, the solution had to anticipate different operational needs that had to be solved with the development of this technology, with the main idea of providing benefits for both MAN Truck & Bus México, and for its customers.

#### Definition of products to develop

- + Fleet Management Platform
- + Advanced Engine Diagnostics
- + Engine protection
- + Clutch Protection

Faced with this great challenge, it was necessary to use the more specialized resources of didcom in the areas of Hardware, Firmware and Software, together with a whole logistic programming in the planning and implementation of the project development in its different phases.



## The solution

Once the scope of each solution was defined, the most optimal form of development and integration at all levels was determined, resulting in the development of three unique products with their own identity for MAN Truck & Bus Mexico. para MAN Truck & Bus México.

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### MAN | Service Guard

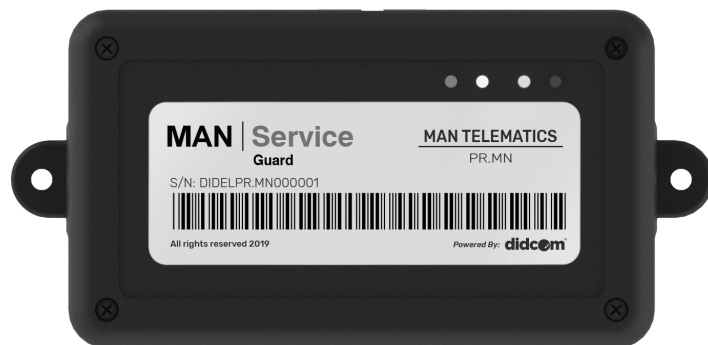
#### Engine Protector

Device designed to prevent damage to the engine, and identify in real time different operating conditions out of range and act at the time to avoid considerable damage to the engine.

- + High engine temperatures
- + Low coolant level
- + Low engine oil pressure
- + Excessive idle time

#### How does it work?

The device monitors the aforementioned variables at all times. As soon as records are detected outside the optimum operating ranges that could damage the engine, an alert is activated to the driver of visual and audible type to react in this regard.



If the operator omits the alert, resetting it and continues driving, the intelligent engine protection process begins, first with the deceleration of the vehicle unit and then deactivating the ignition at the moment the vehicle is safe with speed = 0 km/h.

#### Benefits

- + Reduction of high expenses for corrective maintenance.
- + Decrease in fuel consumption due to idle time.
- + Increased engine life.
- + Configurable in parameters, times and processes, according to customer specifications.



**MAN | Service**  
Guard

### Clutch Protector

It is a device designed to prevent damage to the clutch in Tipmatic transmissions.

It has the functionality to identify in real time different incorrect operating conditions and act at the moment to avoid considerable damage to the clutch.

### How does it work?

The device monitors gear changes in the transmission and the handbrake at all times, through the BusCAN, when it is detected that the handbrake is active and there is a gear in the transmission other than neutral, instantaneously artificial neutral signal that is introduced to the transmission, allowing the closure of the clutch.

Once the operator manually selects the gear shift to neutral, the artificial neutral signal is automatically stopped, returning to normal operation. The device records the time that the event lasted, allowing to identify the useful life that is being reduced from the clutch by an incorrect operation.

### Beneficios

- + Decrease in clutch damaged by wrong operation.
- + Reduction of high expenses for corrective maintenance.
- + Increased life of the clutch.
- + Detection of operators who incur in wrong operating practices.



## MAN | Service Telematics

Central device that integrates and controls the different solutions, is responsible for managing the communication between the different products and making action decisions before any established configuration.

It interacts directly with the technology of the vehicle, obtaining information from the different computers on board, providing accurate records of the main variables that can indicate the way of driving, failures in the operation or in the functionality of the vehicle unit.

### Engine Status

Engine Data: VIN, odometer, fuel used, engine hours, average fuel economy, speed, RPMs, torque, gears, coolant temperature, coolant level, engine oil temperature and pressure, voltage, others.

### Fault Codes

- + Number and interpretation of fault code
- + Origin and detection of ECU that generates the fault code
- + Description of failure and possible solution

Anticipating the detection of failures are proactive actions in order to prevent and avoid significant or critical damage to the units, thus bringing a considerable reduction in maintenance and operation expenses.



This device provides information to the rest of the products for its correct functionality

- + Engine Protector
- + Clutch Protector
- + GPS Device

Interconnects the data generated in the vehicle with the GPS device to transfer data for viewing the information at the platform level.

It is configurable depending on the type of unit where it is connected and the information that is required to obtain, it is also flexible to integrate new solutions.

### Benefits

- + Maintenance automation
- + Reduction of fuel consumption due to mechanical damage or operation failures.
- + Reduction of incidents during trips due to failures
- + Evaluation of driving metrics
- + Synchronization with third-party client-owned systems
- Others.

## PLATAFORMA

**MAN | Service**  
Telematics

**VOLKS | Telematics**

Information is power, and the MAN TELEMATICS platform is undoubtedly the best tool you can count on to know the operation and condition of the entire fleet of vehicles in Real Time.

It is an integral fleet management platform, with its own identity of the brand, in which it concentrates the detail of the operation of each of the units that have the MAN GUARD and MAN TELEMATICS devices installed.

### Engine status

Its function is to concentrate the different areas of fleet management, on a single platform, to offer different indicators in the main areas



**Logistics**



**Security**



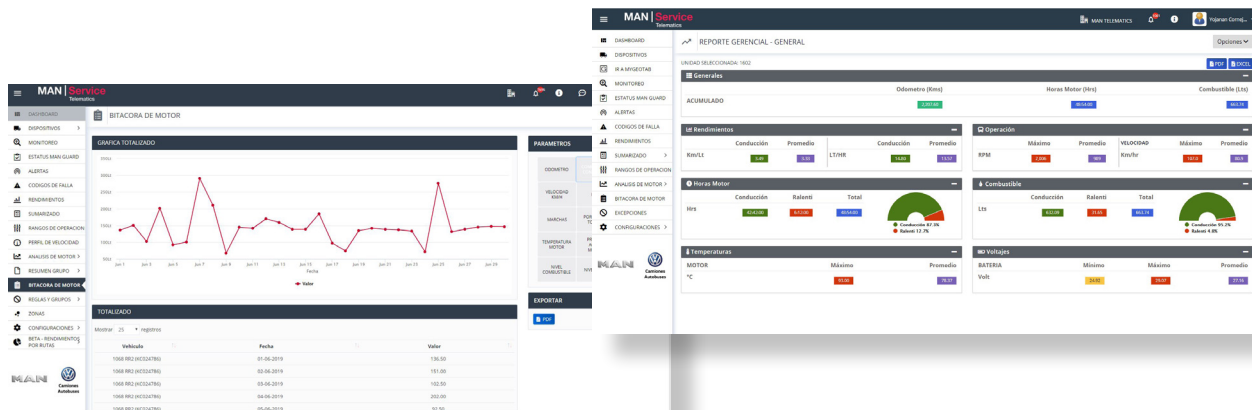
**Operation**



**Driving**



**Productivity**



MAN TELEMATICS, has a solid and flexible structure, based on handling large volumes of data, under Big Data technologies, which allows it to be reliable, secure and responsive.

One of its main objectives is to help convert simple logbooks into statistics, trends and projections for decision-making, which allow to detect patterns in the operation, and anticipate any eventuality.

It allows you to provide information according to the level of user you have.

- + Maker
- + Concessionaire
- + Client

The information is used as a source for decision-making of all involved, taking respective permissions necessary to access only the information of your competition.

It helps improve fleet profitability by monitoring, controlling and monitoring the operation and behavior of the units in real time.

It is a guarantee of considerable benefits through different types of reports that are obtained and that directly impact the operation.

It offers a wide variety of operational and managerial reports, which allow

- + Real-time GPS location
- + Travel Logs
- + Route compliance
- + Mileages and motor hours
- + Risk and safety assessment
- + Engine information
- + Fault Codes
- + Fuel consumption and average fuel economy
- + Operating speeds
- + Engine and clutch protection
- + Business exceptions
- + Alerts and notifications
- + Integration with third party systems

Its main benefit is to centralize all fleet information, facilitating decision making.

MAN TELEMATICS is flexible and comprehensive, and allows integrations with other solutions at the Hardware and Software level, to solve different problems in the operation.



## Results that transcend

Provide MAN Truck & Bus Mexico with a unique technological solution, with which it offers the market a series of telematic services to solve problems that affect the movement of the commercial passenger transport and commercial transport segments of Mexico.

Today there are different challenges that the transport industry needs to solve, and without a doubt the implementation of effective technology in the fleets is the main ally, having as a majority preference the integrated solutions that allow to adapt the service according to the diverse requirements of the customers.

OEMs are beginning to offer their own FMS solution as a standard, which is why MAN Truck & Bus Mexico has found a strategic partner in didcom to offer solution customization, a key value offer for the market.

As of September 2018, a contract is signed between MAN Truck & Bus México and didcom, to provide and incorporate MAN TELEMATICS as an OEM in the high-end bus and truck sector, having in mind to incorporate such solution to the rest of the units in the short term manufactured.

**didcom**

### **About didcom**

Didcom is a hub of engineering and technological development, offering to the international market complete solutions of Hardware, Software and Firmware, for the transportation industry, backed with personalized support and more than 10 years of experience.

**Learn more at**

[www.didcom.com.mx](http://www.didcom.com.mx)