



WORLDWIDE EPC SOLUTIONS FOR OIL & GAS SINCE 1962

Iploca NT Award 2023

Sicim MasterLOG:
The fleet telematic
monitoring system

Sicim MasterLOG

Findings

Sicim's **fleet** currently counts on more than **5,500 pieces of Equipment** operating worldwide, frequently in extremely remote areas.

Logistics, **monitoring, and tracking** has been one of the **major concern** of the Company.

A suitable solution has been identified in the fleet telematic monitoring system, able to identify and provide for each piece of equipment the essential information such as its location, functional parameters, the efficiency of the safety devices, current running hours, etc, all elements necessary for proper management of the fleet.

The systems available on the market were mostly designed for on-road fleets and therefore not able to read signals generated by additional sensors or control units when different from the equipment's ECU, such as the anti-tipping device, the load limiters, and the analogic sensors.

Additionally, the monthly rental fee attached to each device, when applied to all elements of the fleet, would mean an important financial burden for the Company.

Solutions

It was then decided to develop a **customized fleet telematic monitoring system**:

The MasterLOG

The **MasterLOG** has been designed to the specific **Sicim** needs, taking in due account the complexity and variety of the Company's Fleet, able to grant **flexibility** and to ensure **performance** on all typologies of equipment and vehicles.

The technical/functional specifications of the project have been developed by Sicim and both Hardware and Software have been engineered and produced in the regional area of the Company.

Through the MasterLOG web server software, it's possible to monitor, consult and download all the functional parameters/data, notifications of alarms and equipment geo-localization.



Solutions

- Acquisition of functional parameters:
 - ✓ Equipment working hours / Km;
 - ✓ Oil levels, temperatures and pressures of the hydraulic systems;
 - ✓ Engine coolant temperature and level, engine oil pressure and level;
 - ✓ Air intake system status;
 - ✓ Engine rpm;
 - ✓ Equipment travel speed.
- Notification of machine's alarms / malfunctions notified by ECU or different sensors.
- Geo-Localization (geo-coordinates / time information) and daily routes / journeys map of the equipment.
- Possibility to set analog, digital and frequency inputs recorded by different types of sensors.
- Monitoring of the proper functioning of the safety systems fitted on heavy-duty/ lifting machines:
 - ✓ Anti-tipping system;
 - ✓ lifting load limiter;
 - ✓ rated-radius indicator.
- Access to the MasterLOG Web Server Portal allowed through different Accredited Authority Levels.
- Real-time telemetry of critical alarms of the equipment or in correspondence of serious events i.e. accidents and/or abnormal decelerations of the vehicles.
- Telemetry of data via SimCard (GSMA network coverage) or by tethering via Wi-Fi (Mobile Application).
- Remote configuration of MasterLOG and related Firmware updates.
- System integration with the Corporate CMMS Software (Computerized Maintenance Management System) by Oracle J.D. Edwards Enterprise One for the update of the planned maintenance activities.

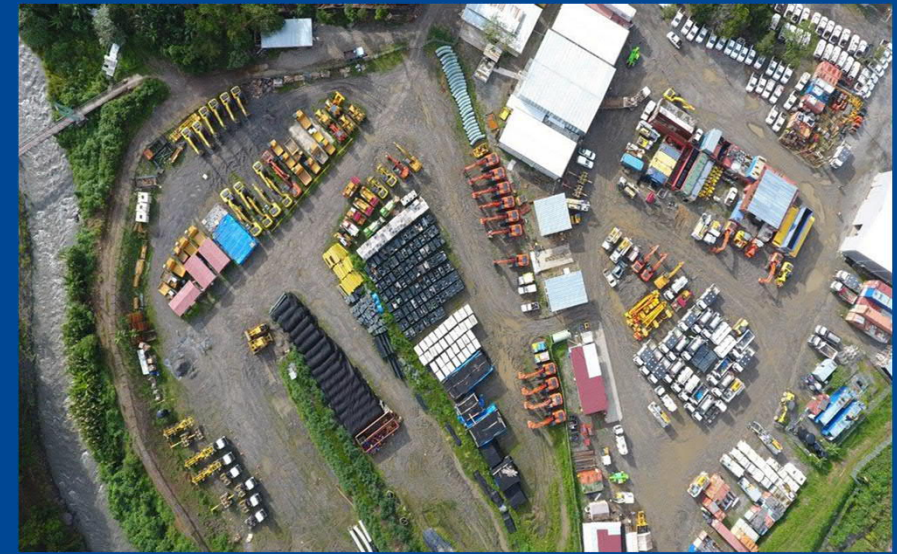
Sicim MasterLOG

Solutions

CONFORMITY AND TEST

The MasterLOG has been designed and tested according to the Automotive Standards and specifications in order to:

- ensure its integrity while operating in all environmental conditions;
- ensure its proof to atmospheric agents;
- ensure its integrity to shocks, vibrations and stresses



DATA TRANSMISSION TO WEB SERVER PORTAL

Data transmission from MasterLOG device installed on board of the equipment to the MasterLOG web Server Portal can be done in two different ways:

- In remote areas, with no GSMA network coverage the Download of the data collected by the MasterLOG is ensured by the Wi-Fi application available on the Smartphone/rugged tablet via tethering.
- Where the GSMA network coverage is available the Data Transmission is ensured by the Global Modem: GPRS(2G), UMTS(3G), HSPA+/LTE(4G)

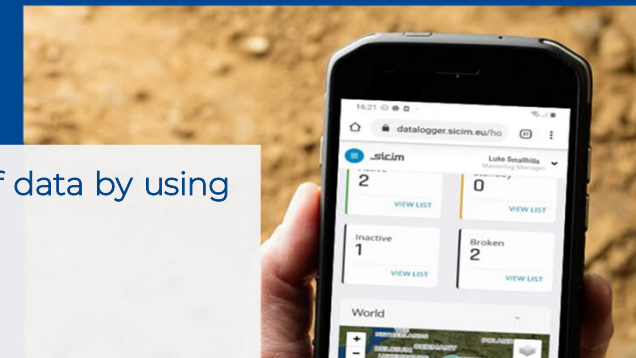


GSMA

The mobile application has been developed to work by Android Technologies to ensure easy and quick download of data by using smartphones or tablets.

The application allows the operator to:

- Connect automatically smartphone/tablet to MasterLOG
- Notify successful download of data.
- Notify successful synchronization and data transfer to Web Server



Achievements

- ✓ Home page (dashboard) allows to visualize all vehicles and equipment linked with MasterLOG.
- ✓ Check each equipment status;
- ✓ Identification of the total number of: working equipment (ACTIVE), equipment with active alarm / alerts (ALARMS), inactive equipment (STANDBY/INACTIVE) and possible breakdowns (BROKEN)
- ✓ Possibility to identify the position of the vehicles/equipments on the map or simply by the search function;
- ✓ The system is configured in such a way that users can consult, download data or create reports based on a selected period timeframe (i.e. one month), even including the routing of the vehicles/equipment and its specific GPS coordinates at a certain date and time;
- ✓ Create new Projects - Cost Centers, Assign Equipments to Projects, Assign a specific Geofenced Area to Projects and Equipments, Set Up / Update MasterLOG, Update Corporate Fleet, Set Up Equipments and Equipments Models, Set Up Access Point Name (APN), Create new Customers;
- ✓ Availability of a section by which it is possible to set up program control instructions that will be activated by the MasterLOG when the equipment trespass the assigned geofence area.

The development of the MasterLOG went through a major crisis that delayed its finalization, such as the “Crisis of the Microchips after the Covid-19 pandemic, and the replacement of the selected supplier for one of the major components, the UMTS/GSM Global Modem, which was resolved by adopting a new modem which implied a major modification in the design of the motherboard.

As of today, have manufactured 1,850 MasterLOG units and their installation is ongoing. Additional 800 units will be ready by next July to be all installed by the end of the year.

All the planned functions of the MasterLOG have been achieved. The configuration of the System grants an immediate tracking of the equipment and the functionality status of the fleet, ensuring the optimization of logistical and maintenance aspects.

The data are recorded and stored in the web server software and allow at any time the statistical analysis of the performance of the fleet, which is available for a single or for a family of equipment, for a specific Projects etc within a selectable time frame period.



THE GRAPHIC ABOVE SHOWS THE DAILY WORKING REPORT FOR A PROJECT EQUIPMENT FAMILY M-01 CRAWLER EXCAVATORS – 2 MONTHS TIME FRAME