LA SEMAFORICA

TMACS

TOTAL MANAGEMENT ADVANCED CONTROL SYSTEM

SMACS

SMART CITY SYSTEM

Dear customer,

La Semaforica S.r.l. and TECSEN deal with traffic regulation and the development of ITS systems for Smart Mobility applications. Thanks to their experience and know-how gained more than 75 years of experience in traffic regulation and management, today the group presents itself on the market with a complete and cutting-edge product range with the highest levels of quality and professionalism that distinguish us. We offer solutions and systems to improve traffic, safety and quality by integrating our knowledge of electronics, information technology and transport engineering for the design, maintenance and management of these systems.

PRODUCTS

The **PRODUCTS** division designs and manufactures components for traffic control and regulation according to the highest quality standards:

- 4 lines of traffic lights, two in polycarbonate and two in aluminum
- aluminum traffic light totems
- IP65 retrofit LED modules for traffic lights
- countdown traffic light modules
- pedestrian reservation devices (traditional and touch buttons) and horns (audio guides) for visually impaired people
- 4 lines of traffic light controllers with European standards
- products for traffic detection and classification using different technologies
- systems for detecting bicycles and for displaying the number of passages with an indication of the quantity of CO2 saved
- luminous signs for the protection of pedestrian crossings, warning signs and car park signs

SYSTEMS

We provide **SYSTEMS** on the **TMacs and SMacs software PLATFORMS** for the management of different integrated devices with the creation of different solutions such as:

- Monitoring and coordination of traffic lighted crossings or intersection grids to reduce waiting times and improve traffic flow
- Traffic light management with priority systems for the city's tramline
- Control and monitoring of urban traffic by means of data acquisition, for the development of campaigns to improve sustainable mobility
- Systems for the management of dynamic alternating one-way streets according to the traffic detected and the type of vehicle
- Dynamic control of simultaneous passage of heavy vehicles and management of one-way traffic on bridges with static problems
- Traffic light priority for public transport with proprietary Safety go system
- Flooding control systems for subways by means of automatic optical alerts with traffic light lanterns, information on VMS or display and closure of traffic by using automatic barriers
- Weather warning systems by means of devices measuring environmental parameters and transferring information on VMS and communication through social channels
- Bicycle detection systems with display of measured data on displays or totems
- Heavy vehicle detection systems
- Monitoring of vehicles in tunnel
- Subsystems harmonisation through Smart City central software in control rooms

TMACS PLATFORM MODULES:

- MACS TRAFFIC Urban Traffic Control System UTC
- MACS ANALYSIS System for traffic data management and analysis
- MACS FLOW Traffic optimisation through prediction and travel time estimation
- MACS TRACKING Surveying and priority management system
- MACS VISUAL Complete solution for VMS management
- MACS FLOOD Underpass flooding monitoring system
- MACS PARKING Management and Guidance Car Parks Control System
- MACS MMS Maintenance Management System
- MACS SAFETY Digital Twin for Road Safety
- MACS COOPERATIVE Management and Interfacing for C-ITS

SERVICES

The **SERVICES** division, which is divided into different levels, employs specialized and highly experienced personnel able to assist our customers from the installation and laying of materials, through the optimal setting of the devices to post-sales support and service help desk or on site:

HELP DESK ACTIVITIES:

Support activities for the use of the TMacs centralization platform and SMacs Smart City Supervisor on differentiated service levels.

+30
COUNTRIES

+5000
CENTRALIZED SYSTEMS

80
YEARS

La Semaforica has been awarded ISO 9001 certification for its quality processes in the design, manufacture, installation and maintenance of its products and maintenance of its products, ISO 45001 certification for the safety of its workers, and ISO 14001 for respect and protection of the environment.

TMACS

TOTAL MANAGEMENT ADVANCED CONTROL SYSTEM

TMacs is an open ITS platform and is an essential and powerful tool for traffic control and management.

The configuration of the system is completely customizable and TMacs offers maximum performance in any application related to Infomobility. The open architecture of TMacs allows the control of different devices (traffic controllers, sensors, control devices for public lighting, variable message signs, weather stations, car parks, etc.) and offers local authorities the possibility to delegate the management and maintenance of the various subsystems.

The TMacs platform, an acronym for Traffic Management Advanced Control, is a high-level ITS system that is the most complete and efficient answer to the new Smart City requirements for improving mobility management.

TMacs manages, in a single interface, various devices such as traffic light systems with different types of controllers and traffic monitoring stations integrated in the traffic light intersection or as dedicated measuring points with radar technology, with coils for detecting the magnetic profile of vehicles, video systems, artificial intelligence video systems, laser scanners.

TMacs allows the configuration and verification of public transport priority from the centre, the management of displays and PMVs, the management of warning systems, subway flood control systems, parking guidance systems, weather stations, air quality stations, background noise detection systems, etc.

The TMacs Platform is based on the integrated use of technologies that enable intelligent transport monitoring, evaluation and management through IoT Internet of Things and AI devices by collecting and analysing data on traffic, road conditions and 'connected' vehicles in real time with the aim of making mobility safer, more efficient and sustainable through management and control solutions.

An evolved System that enables the processing and validation of the massive amount of data collected in real time thanks to AI, edge and cloud computing, making it possible to reshape urban mobility by improving safety and efficiency while reducing polluting emissions.

The TMacs Software Platform is characterised by the following features:

- Modular and scalable structure that allows management to be adapted to the specific needs of each organisation depending on the number or groups of installations to be managed;
- Flexible structure for optimising and customising the management of the ITS System for each type of user, with the possibility of exporting all the data collected by the System to the field;
- Client and Web Based software accessible by installing software or using a browser for the expandability of operator workstations;
- Integration available with Identity providers such as Open ID or Microsoft Azure. The IdP can authenticate the user directly or provide authentication services to third-party service providers;
- User-friendly interface with the display of exportable synoptics, reports and graphs for easy plant management from Control Room, PC Client, on the Web and on App;
- Identity management with different levels of interaction with the System that allows users to be profiled with user and password to access the TMacs Software Platform and users can be individually enabled to all functions depending on the devices to be managed and the level of interaction they need to have with the Platform. For example, 'supervisor', 'maintainer', 'simple vision' profiles can be considered;
- Traceability and verification of operations in System logs for improved security;
- Performance monitoring for a verification of the level of operation of the Systems in the field;
- System with certified Cloud availability, using integrated data, organised and visualised on different logical layers;
- Cloud storage management with optimal data storage in the data centre;
- Access via VPN clients to all resources of the cloud infrastructure to perform software release and system maintenance activities.

SMACS

SMART CITY SYSTEM

SMacs is designed as a cross-functional platform for comprehensive smart city management.

Unlike TMacs, which is primarily focused on traffic management and related functionalities, SMacs provides a broader approach encompassing various urban subsystems.

It offers a unified interface for monitoring and controlling connected systems across a smart city, enabling comprehensive management and simplified control mechanisms.

SMacs is designed with a flexible backend structure, ensuring compatibility with a multitude of subsystems and continuous evolution for expanding services. Its strength lies in its ability to provide a holistic approach to city management, encompassing traffic control, environmental monitoring, public safety, and more.

Designed to transcend the traffic focused capabilities of TMacs, SMacs represents a new horizon in urban management, offering a unified platform for overseeing a multitude of urban subsystems.

Its key strength lies in its holistic approach, integrating traffic control, environmental monitoring, public safety, and more into a single, user-friendly interface.

With its advanced data analysis and reporting tools, SMacs empowers city officials with the insights needed for informed decision-making and efficient resource allocation.

Its flexible and scalable architecture ensures compatibility with a wide range of technologies, making it adaptable to cities of any size.

By enabling real-time monitoring and response, promoting sustainability, and enhancing safety, SMacs is not just an evolution in smart city management: it's a revolution, setting a new standard for how cities operate and evolve.

- Integration Capabilities:

Offers a single dashboard for monitoring and managing all connected devices and systems in a smart city. Able to handle a great number and modes of connection, the subsystems have plenty of ways to be connected to SMacs, granting the possibility to gain visibility over existing systems, with no work in the existing architecture.

- Data Analytics and Reporting:

Features enhanced data analytics and reporting tools for informed decision-making. SMacs is able to harmonise the data from the connected subsystems and provide relevant reports, merging data from sources that could give better insights when fused.

- User-Friendly Interface:

SMacs is designed for the City's control room, gain as much data as possible from an interface, navigate seamlessly between the views you'd like to monitor, the platform was designed with ease of use and customisation in mind.

- Real-Time Monitoring and Response:

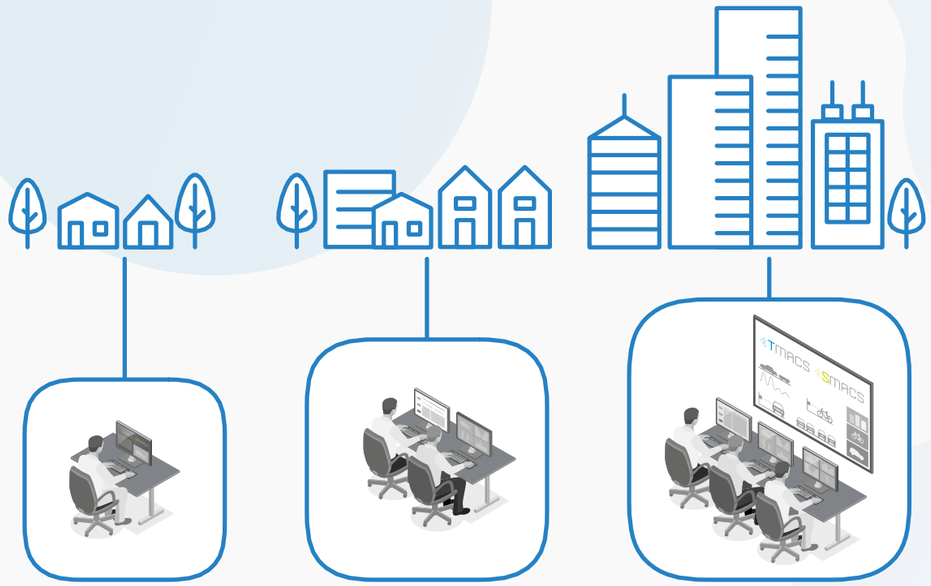
SMacs leverages the data it obtained from the devices on-fields, disregarding the manufacturer or source. Thanks to its streamlined architecture, the platform enables real-time visibility over the city's systems, giving all the critical information and allowing quick, effective measures, potentially chaining and coordinating several sub-systems to respond to a specific case, by pushing a single button.

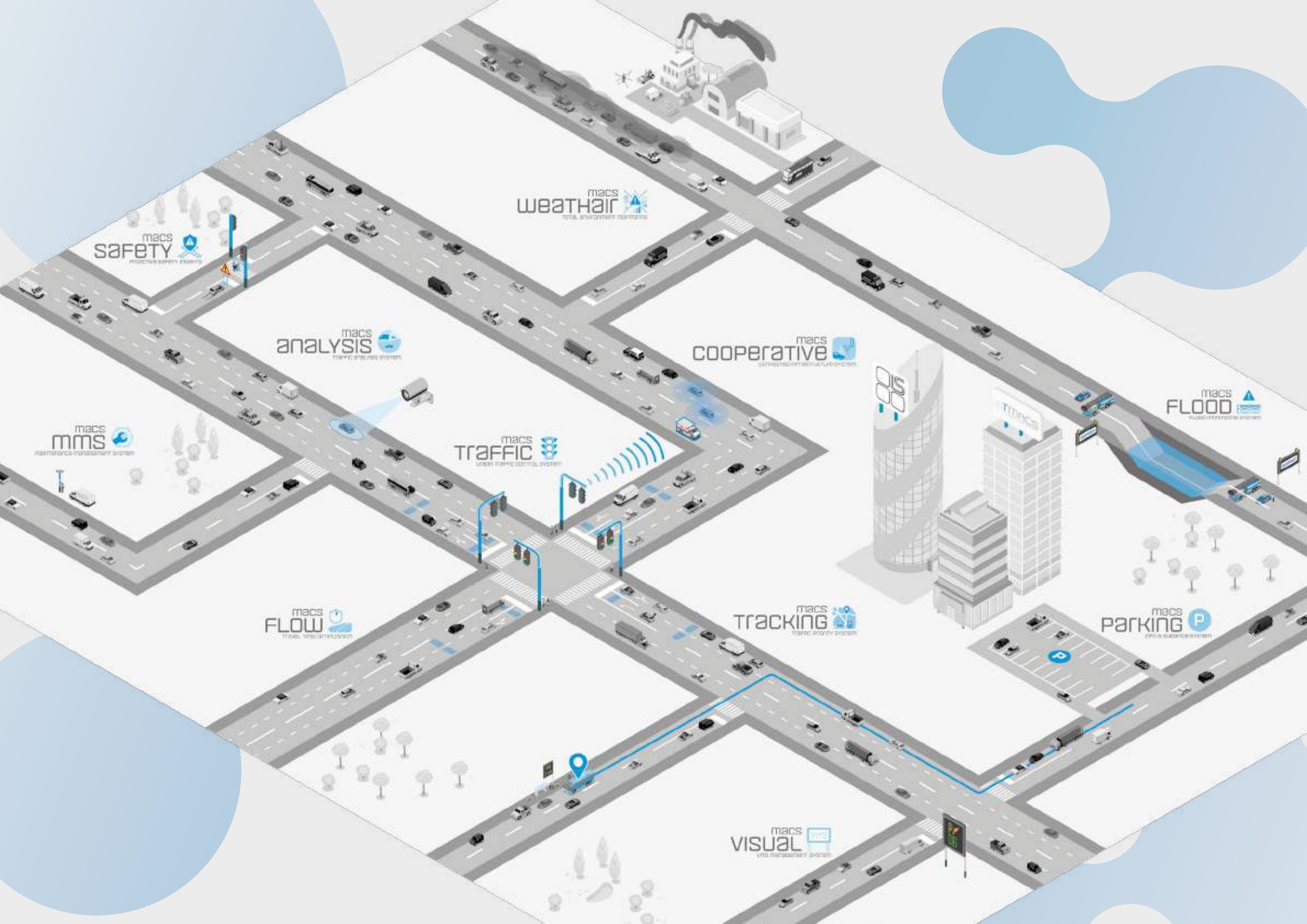
- Sustainability, Efficiency and Safety:

Thanks to SMacs the city's operations get streamlined, easily monitored and kept on track. The wide and interconnected visibility the platform enables, allows finding variables directly impacting one another, in systems previously managed by different systems, hard to relate. This way City Officials can ensure the correct policies for sustainability and faster response times for citizens' safety.

- Flexibility and Scalability:

Designed to adapt and scale according to city-specific needs and technological advancements. The platform can adjust its infrastructure size to fit the small municipality as well as the big metropoli.




macs weathair
macs safety
macs analysis
macs cooperative
macs flood
macs mms
macs traffic
macs flow
macs tracking
macs parking
macs visual

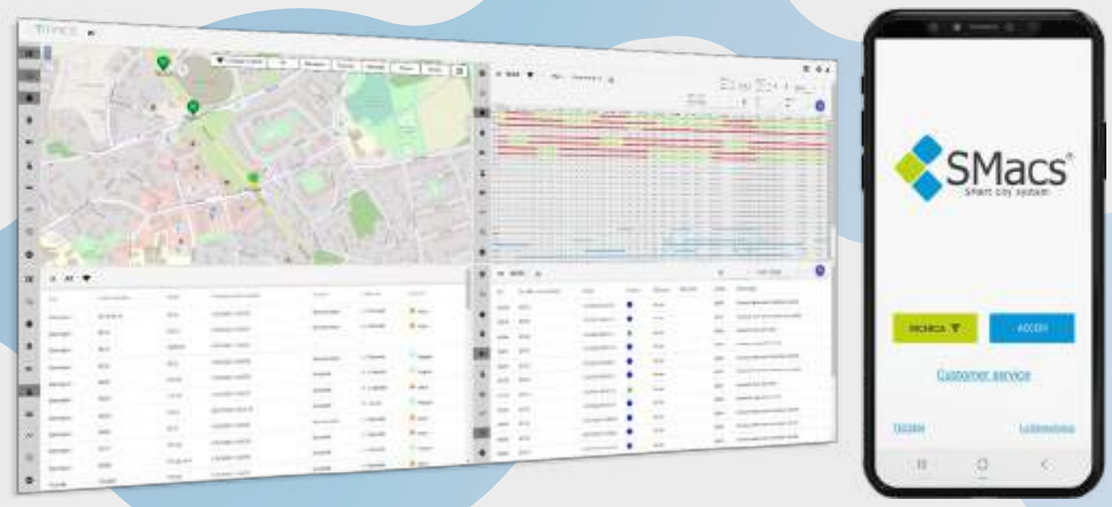
macs TRAFFIC
URBAN TRAFFIC CONTROL SYSTEM

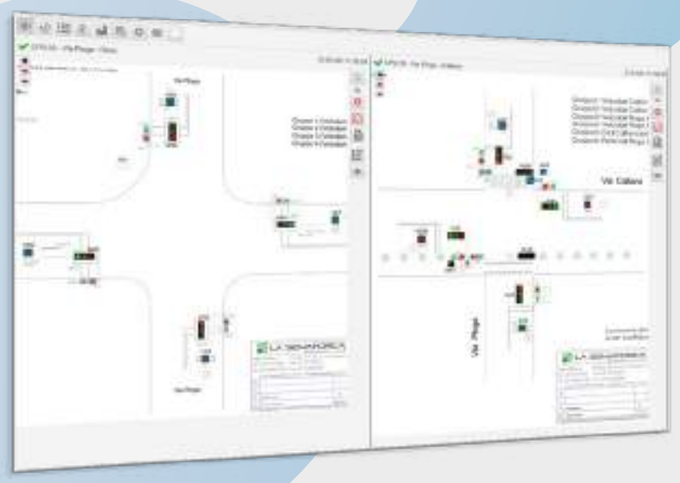
TRAFFIC MANAGEMENT IN SMART CITIES

MAIN FEATURES

The traffic management solution for the smart city. UTC urban traffic control, an essential tool for monitoring and controlling networks of traffic light systems. The system is able to operate on complex networks and to constantly determinate control strategies to optimize the performance of the traffic light network.

- Real-time status control of traffic light systems with real-time display of phases, group status, and field sensors for traffic detection;
- Interaction with the traffic light controllers in order to change the operating mode;
- Diagnostic control, with the possibility of restarting the regulator on the road, resetting any alarms and various reconfigurations;
- Systems log, with historical searches to check events with categorization according to level of severity;
- Remote display and control of functional status, diagnostics and total management at programming level of STARLED3 LED optics, VIA horns (also integrates the noise function for ambient noise) and countdown devices on CDI interface.





BENEFITS

- improved and optimized traffic management
- Reduction in atmospheric emissions and noise pollution
- Reduction in waiting times and stop-and-go traffic near traffic lights and queues
- Fully adaptive: dynamic optimization and dynamic plan selection with activation of specific traffic light plans at pre-set conditions

macs
analysis
TRAFFIC ANALYSIS SYSTEM

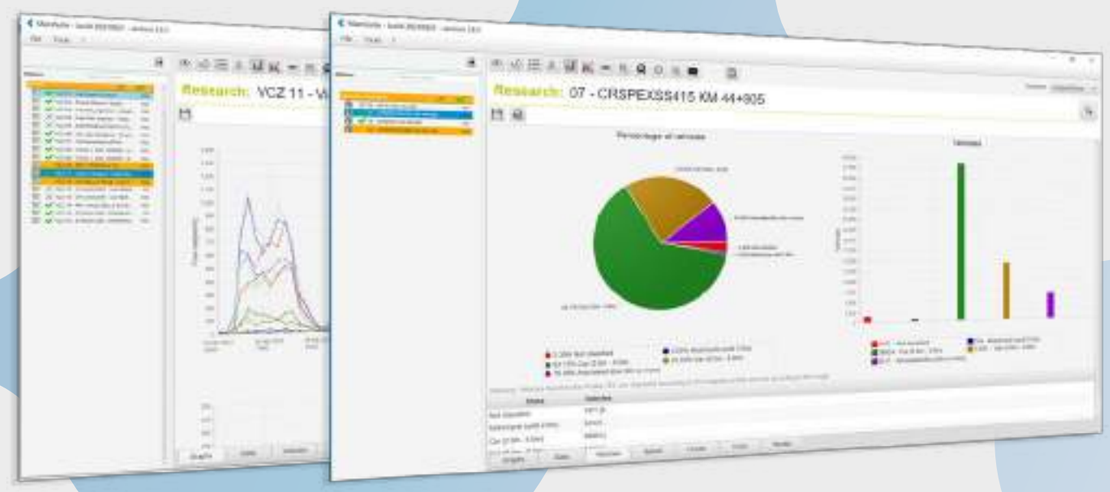
COLLECTION AND ANALYSIS OF TRAFFIC DATA IN SMART CITIES

MAIN FEATURES

Sensor monitoring with traffic data analysis in smart cities.

Essential for obtaining mobility-related analysis and processing, with the aim of understanding traffic dynamics. The data, obtained through devices on the road, are useful for statistical purposes and to study better solutions for the mobility of the Smart City.

- Visualization of data in tabular and graphical form, easily exportable for further study and analysis activities;
- Real-time monitoring of vehicle flow;
- Vehicle classification according to type of classification scheme;
- Daily and weekly traffic trends;
- Long-term historical research with parameter setting;
- Constant monitoring of field sensor diagnostics;
- User-friendly interface



BENEFITS

- Tool for studying traffic management strategy
- Road safety analysis to assess the type of vehicles on the road and their speeds
- Environmental analysis to assess the impact of traffic on the environment;
- Planning of activities on the road network according to the traffic trend to limit phenomena such as congestion, queues, accidents, etc...
- Interaction with other systems to inform users in the event of an increase in road traffic

macs FLOW
Travel Time Optimization

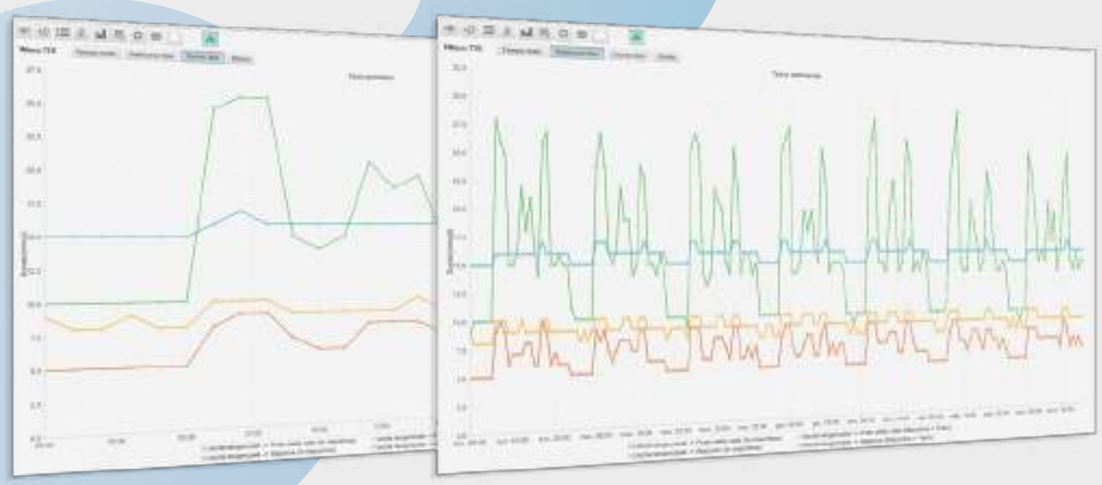
Traffic Optimisation through Prediction and Travel Time Estimation

Introduction

Introducing the Flow Module, the pinnacle of traffic management innovation within the TMacs suite. This groundbreaking module offers a holistic solution for real-time traffic flow optimization and travel time accuracy in urban landscapes.

Key Features and Benefits

- Real-Time and Predictive Traffic Analysis: Flow elevates traffic management to new heights by integrating real-time observations with predictive analytics. Leveraging historical data alongside current traffic conditions, it forecasts upcoming traffic trends, enabling traffic controllers to proactively manage and optimize traffic flow.
- Dynamic Traffic Signal Optimization: At its heart, Flow intelligently adjusts traffic signals in synchronization with live traffic dynamics. This real-time adaptation not only alleviates congestion but also enhances road safety, ensuring smoother urban mobility.
- Advanced Travel Time Estimation: Utilizing cutting-edge algorithms, Flow delivers precise travel time predictions across various urban routes. This enables commuters to make informed route choices, significantly reducing travel times and improving the overall commuting experience.
- Data-Driven Decision Support: By processing vast quantities of traffic data, Flow transforms complex datasets into actionable insights for traffic planners and policymakers. This supports the development of informed traffic management strategies and facilitates efficient urban planning.
- Customizable Traffic Management Scenarios: Flow empowers traffic authorities to tailor traffic management scenarios to specific needs, whether for rush hours, public events, or emergency situations. This flexibility ensures optimal traffic conditions across diverse circumstances.
- Seamless Integration with Other Systems: Designed to complement and enhance the TMacs ecosystem, Flow interconnects with other modules to foster a more integrated and intelligent urban traffic network.
- The Flow Module not only signifies a leap forward in traffic management technology but also aligns perfectly with the evolving demands of dynamic urban environments. It offers cities a smarter, data-driven pathway towards achieving unparalleled traffic efficiency and commuter satisfaction, marking a new era in urban mobility solutions



macs TRACKING
TRAFFIC PRIORITY SYSTEM

PRIORITY MANAGEMENT FOR PUBLIC TRANSPORT AND EMERGENCY VEHICLES

MAIN FEATURES

Traffic light priority management for public and emergency vehicles.

Macs Tracking interacts with the traffic light controller through the Macs Traffic module, managing the sequence of traffic light systems in order to priorities the passage of vehicles. The system can operate completely autonomously through its own AVL Automatic Vehicle Location, through the installation of a GPS tracking device on the vehicles. The system monitors the positioning of the vehicle and detects when it is approaching a road intersection.

- Control of the fleet's position in real time on a map
- Control of routes and driving times
- Traffic control, with GPS tracker
- Locate the nearest vehicle to the request point

Safety GO is the system for implementing traffic light priority in favor of emergency vehicles and authorized vehicles based on the APP for mobile devices.

It allows you to interrupt the traffic light cycle to extend, reduce or anticipate the green light in favor of the vehicles managed by the system and provide the green wave in subsequent intersections.

Bike Go! is the App to implement the traffic light priority for bicycles. Cyclists with the Bike Go! App! active on their Smartphone, they will be detected by the traffic light system, centralized with the TMacs System and given the green light to avoid long waits in traffic.

The App will also allow you to detect the number of bikes near the traffic light system.

BENEFITS

- Improved public transport traffic management
- Efficiency of the traffic light priority system
- Reduction of atmospheric emissions and noise pollution

macs VISUAL VMS
VMS MANAGEMENT SYSTEM

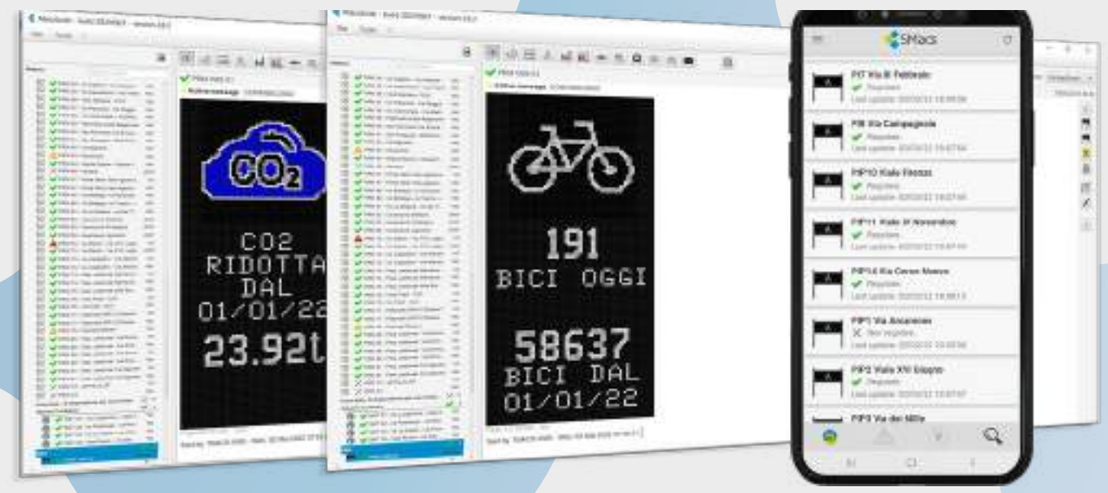
CONTROL AND MANAGEMENT OF VARIABLE MESSAGE SIGNS AND INFOMOBILITY DISPLAYS

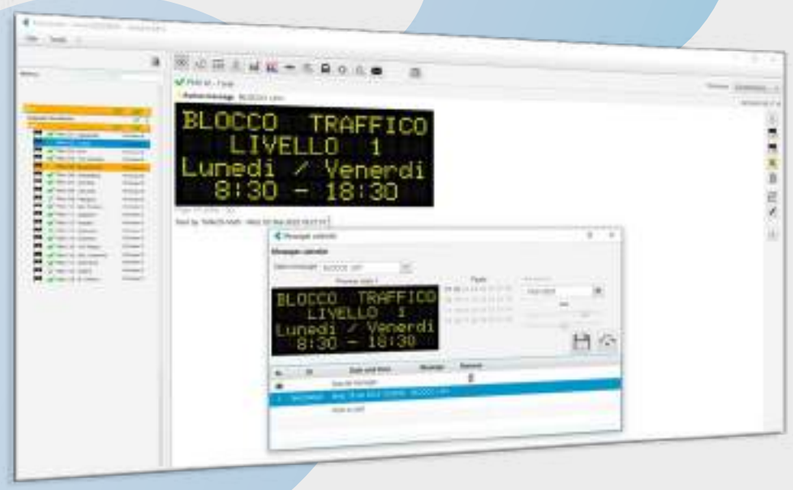
MAIN FEATURES

Management and control of variable message signs and displays for infomobility.

The simple and intuitive module provides the user with all the necessary tools for creating and sending messages on the variable message signs and displays. The loading of messages on the road with one or more pages can be done automatically by means of a graphical user-friendly interface with a dedicated editor for entering text and pictographs.

- Display of VMS / display status
- Sending and removing messages
- Message scheduling with insertion period setting
- Control of VMS / display diagnostics, in the presence of specific sensors
- Control of system logs





BENEFITS

- Interaction with other modules of the TMacs platform to create ITS systems for Infomobility
- Display of traffic status information
- Visualization of parking status in the proximity of the panels
- Weather alert information

macs
weathair
TOTAL ENVIRONMENT MONITORING

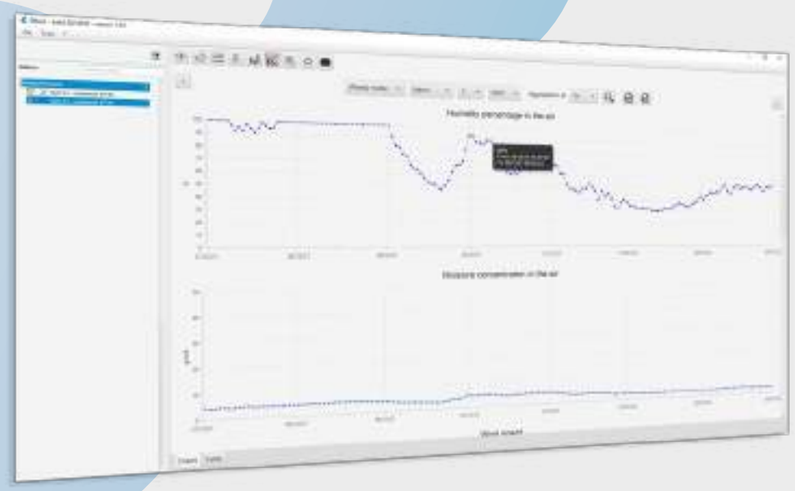
COMPREHENSIVE ENVIRONMENTAL MONITORING AND ALERT SYSTEM

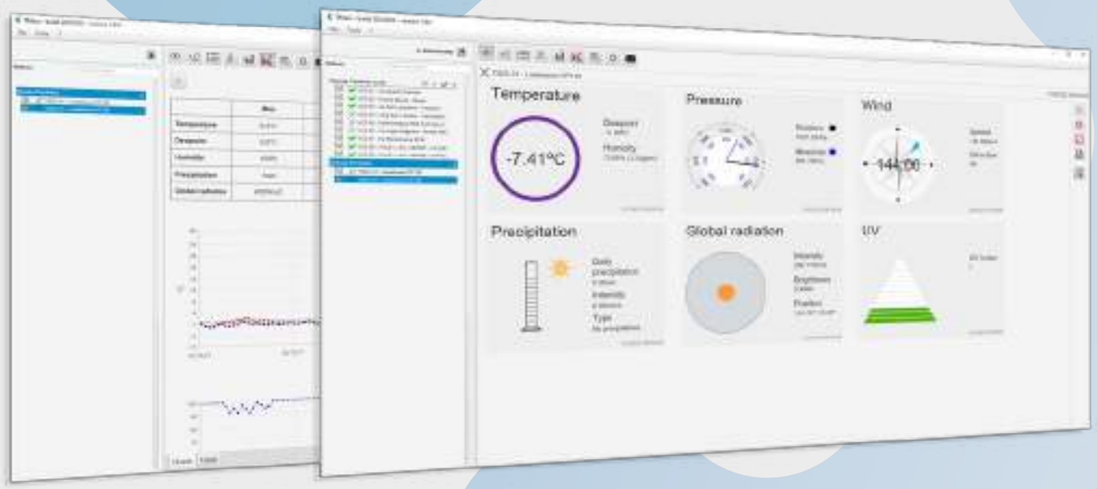
INTRODUCTION

Introducing the WeathAir Module, the latest leap forward in environmental monitoring within the TMacs platform, encapsulating the essence of integration and comprehensive oversight. WeathAir amalgamates the previously distinct capabilities of weather monitoring, air quality surveillance, noise pollution tracking, and weather alert systems into a singular, robust solution tailored for urban environmental management.

KEY FEATURES AND BENEFITS

- Unified Environmental Monitoring: WeathAir stands as a multifaceted platform, streamlining the tracking of air quality, noise pollution, and meteorological conditions. This integration fosters enhanced environmental management strategies for urban settings, ensuring a healthier living space.
- Real-time Weather Alerts: Offering timely weather alerts and forecasts, WeathAir is pivotal in emergency preparedness and safeguarding public safety against adverse weather phenomena, ensuring communities can respond swiftly and effectively.
- Advanced Air Quality Monitoring: Through the incorporation of cutting-edge sensors and analytics, WeathAir delivers precise monitoring of air pollution levels. This is vital for the development of public health initiatives and the formulation of environmental policies aimed at pollution reduction.
- Noise Pollution Analysis: The module's ability to monitor and analyze urban noise levels aids in addressing noise pollution, evaluating its impact on urban dwellers, and implementing measures to mitigate its effects, promoting a quieter, more serene city environment.
- Integrated Emergency Response System: WeathAir seamlessly interfaces with emergency management systems, facilitating immediate alerts and coordinated responses to environmental hazards, thereby enhancing urban resilience.
- Data-driven Environmental Policy Support: By providing comprehensive environmental data, WeathAir supports the crafting and implementation of sustainable urban development policies, contributing significantly to the vision of greener, more sustainable cities

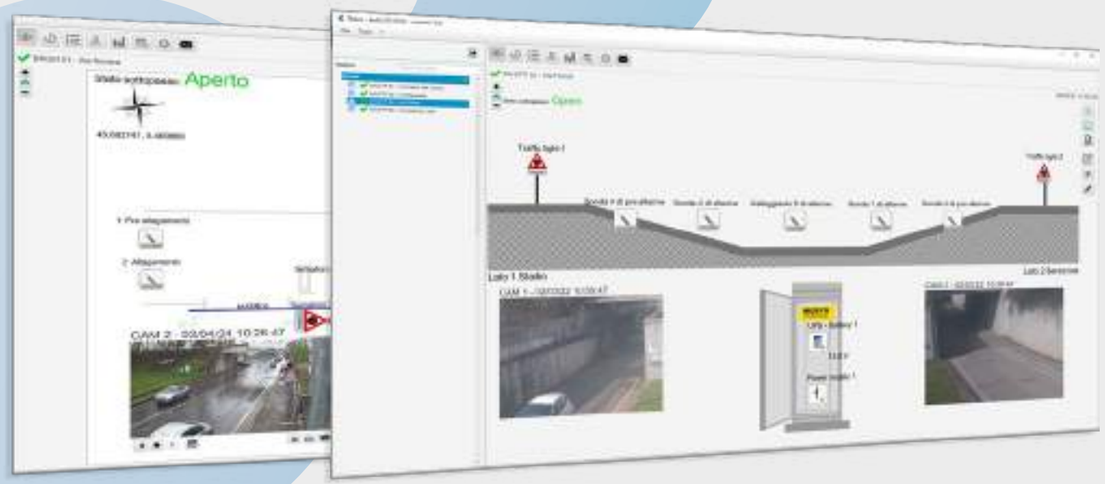




macs FLOOD

FLOOD MONITORING SYSTEM

MANAGEMENT OF SYSTEMS FOR SUBWAYS FLOODING CONTROL



main features

System for the management of subway flood control systems.

Macs Flood is the software module of the TMacs platform that provides a centralized supervision system for monitoring flood control systems remotely. In subways, the presence of water following heavy rainfall can cause dangerous situations for users in transit. The proposed monitoring and alarm systems are used for the early warning of the subway flooding situation with the blocking of vehicle transit by activating the red traffic lights. In addition, real-time warning notifications are sent to the authority and the offices in charge such as civil protection, technical office, local police and the maintenance company, indicating the flooding in progress and alarm notifications in the event of a flooded subway by sending notifications via e-mail and voice call.

- Remote viewing of subway status
- View the status of field components
- Remote diagnostics control
- Cameras integrated in the system for visual control of the status of the subwayo

BENEFITS

- Centralized real-time alert system
- Remote event verification to check system activation
- Integration of the System with the other modules of the Platform to inform users by means of messages on VMS, insertion of dedicated traffic light plans on traffic light systems in the vicinity of subways, etc...

macs PARKING
INFO & GUIDANCE SYSTEM

PARKING GUIDANCE SYSTEM FOR SMART CITIES

MAIN FEATURES

Management for smart city parking guidance system.

The module provides up-to-date information on the occupancy status of car parks, to solve traffic congestion problems in the city and to transmit correct information to the public. The system can manage the data collected by the access control devices in the car parks, the parking spaces and is able to display the information on the availability of parking spaces on information panels, displays or with the lighting of traffic lights to indicate whether the parking space is free or full. The status of the parking spaces is analyzed, validated and made available to the platform operators, maintainers and/or published via web services to third parties. The module can manage data from the entire urban parking network without limitation of number providing end users with a comprehensive and consistent view of the city..

- Display of parking status
- Car park calibration with setting of car park capacity, reserved spaces, etc.
- Trending of traffic data from sensors in the car park
- Algorithm for automatic calibration and validation of the data detected on the field
- Control of system logs

BENEFITS

- Reduction in atmospheric emissions and noise pollution
- Reduction of traffic in cities, as vehicles are informed of the status of nearby parking spaces
- Archiving of traffic data with trends in vehicle flow.

macs mms
maintenance management system

T-alert
notification system

management of notifications of anomalies and faults and mms

main features

System for setting up alert system by means of notifications in the event of anomalies and faults and maintenance management system.

A system that allows you to configure the management of notifications in the event of an anomaly or fault on installations centralized in the TMacs Platform.

This is a fundamental tool, especially for maintenance technicians who need to be informed about the status and operation of the installations in order to guarantee the full safety of the System.

- Separate reports by type of fault
- Setting up of voice call sending to fixed and mobile numbers, e-mail and SMS to provide information in case of failure or anomalies
- Real-time notification to the authority and the reference maintainer
- Customized configuration for each installation to be monitored
- Ticket opening for remote assistance.

benefits

- Each notification sent is recorded in the platform's system logs.
- Real-time notification sent to the body and the reference maintenance technician
- Reduction of intervention times and knowledge of the type of malfunction, before the on-site assessment with the possibility of finding useful materials for solving the failure

macs SAFETY
PROACTIVE SAFETY INSIGHTS

THE GROUNDBREAKING DIGITAL TWIN FOR ROAD SAFETY

INTRODUCTION

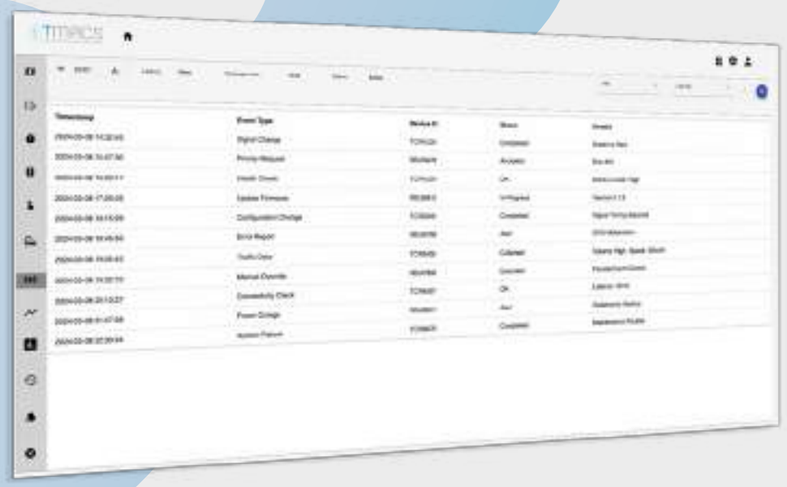
The Safety Module represents a groundbreaking addition to the TMacs suite, focusing on elevating road safety through in-depth monitoring and sophisticated analysis of critical safety metrics. This module harnesses data from diverse sensors to generate digital twins of urban landscapes, offering a granular view of traffic dynamics and infrastructure health, thus paving the way for safer urban roads.

KEY FEATURES AND BENEFITS

- Digital Twin Creation: By synthesizing data from various sources, the Safety Module crafts accurate digital representations of urban environments. This allows for the simulation and analysis of traffic scenarios, aiding in the strategic planning of infrastructure and safety measures.
- Accident and Near-miss Monitoring: The module's vigilant monitoring capabilities extend to recording incidents such as accidents and near-misses. This function is instrumental in gathering insights critical for the enhancement of road safety protocols and strategies.
- Pedestrian Vulnerability Analysis: With a dedicated emphasis on pedestrian safety, the Safety Module analyzes data to pinpoint and mitigate areas where pedestrian vulnerability is high, ensuring safer urban spaces for walking.
- Infrastructure Health Monitoring: Maintaining the integrity of traffic infrastructure is vital for safety. This feature monitors the condition of roads, bridges, and related infrastructure, facilitating timely maintenance actions to avert potential hazards.
- Customizable Safety Alerts: The module's adaptability allows for the customization of safety alerts and parameters. This flexibility ensures that the system can be tailored to address the unique safety needs of different urban settings.

macs
cooperative
connected infrastructure system

management and interfacing for c-its



introduction

The Cooperative Module within the TMacs framework marks a significant advancement in the realm of Cooperative Intelligent Transport Systems (C-ITS). This innovative module is engineered to enhance urban transportation through the integration of state-of-the-art connectivity and communication technologies, ensuring smoother and safer traffic operations.

key features and benefits

- V2X Device Integration: At the core of the Cooperative Module is its capacity to facilitate the seamless integration and management of Vehicle-to-Everything (V2X) devices. This is pivotal for
- Enabling efficient data exchange across smart transportation networks, crucial for the real-time responsiveness of the system.
- Real-time Data Monitoring: The module excels in monitoring the data communication flow between vehicles, infrastructure, and traffic management systems in real time. This capability
- Significantly contributes to improving traffic flow and enhancing road safety by enabling dynamic, data-driven decisions.
- Advanced Reporting and Analytics: With its advanced analytics engine, the Cooperative Module provides detailed insights into the performance and efficiency of C-ITS devices. These analytics
- Support ongoing system enhancements and optimization, driving forward the efficiency and reliability of transportation networks.
- Service Level Notifications: Ensuring the reliability and optimal performance of C-ITS services is a key function of this module. It delivers timely notifications and updates about the status of various services, maintaining high service levels and system dependability.

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