



ORIONE

Traffic Signal Controller



Orione is a next-generation traffic signal controller designed for managing medium-to-small-sized intersections; in its maximum configuration, it can control up to 12 traffic signal groups.

Orione features a fully modular distributed intelligence architecture, based on a differentiated bus system that ensures high reliability and safety.

The controller is equipped with a powerful CPU that enables real-time processing of traffic data for optimizing traffic flows through specialized algorithms.

Monitoring Functions:

- Generation of "LOG" files and statistical files (alarms, activity, traffic data);
- Automatic sending of diagnostic and alarm messages via cellular network (optional router required);
- Remote access for configuration, diagnostics, and file transfer through an integrated WEBSERVER (optional router required).

The controller can operate independently in "stand-alone" mode while maintaining remote access and monitoring capabilities, or it can be connected to most common UTC systems, including the SCAESTCWEB2.0 system, which allows full exploitation of the controller's features.

Orione is equipped with multiple communication ports (RS232, RS485, USB, ETHERNET) and can be supplemented with the following communication devices:

- Router for remote access via cellular network (optional);
- WiFi for local wireless access (optional).



Regulatory Compliance

- EN50556 Road Traffic Signal System
- EN50293 EMC
- EN12675 Functional Safety
- Certificates and test reports available upon request

Orione Capabilities

- Manages up to 12 traffic signal groups (36 power outputs);
- Supports up to 8 vehicle loop detectors;
- Up to 48 digital inputs;
- Up to 16 digital outputs;
- Up to 20 relay outputs;
- 32 traffic signal plans selectable remotely or locally based on calendar or external events.

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General Features

- Monitoring of all traffic signal lamps to detect and report individual lamp failures;
- Collection of volumetric and classified traffic data through various types of sensors;
- Archiving of alarms, activities, diagnostic information, and traffic data;
- Alarm or programmable event notifications via SMS or email;
- Compatibility with major UTC systems;
- GPS clock synchronization, essential for implementing multi-plan green waves;
- Maximum programming flexibility with custom user script functionality;
- Optional night dimmer function for traffic signals.

Safety

Orione is equipped with multiple control circuits based on hardware and software redundancy logic.

The safety system consists of various sensors, processors, and circuits:

- Voltage measurement sensors on traffic signal outputs;
- Current measurement sensors on each traffic signal output circuit;
- Temperature detection of key electronic circuits;
- Independent processor controlling green and red signal conflicts;
- Independent processor on each output control board responsible for:
 - Consistency check between logical commands and traffic signal output status;
 - Monitoring current flow on each output to verify correct lamp operation.
- Hardware and software watchdog control on processors and microcontrollers;
- CPU board safety checks:
 - Data consistency verification in memory;
 - Hardware configuration checks;
 - Consistency check between logical commands and traffic signal outputs;
 - Corrective actions on commands to comply with the safety matrix;
 - Monitoring of traffic signal cycle timings;
 - Measurement and control of power supply voltage;
 - Configuration changes protected by PIN code.

Software Configuration

The Orione controller can be programmed locally or remotely using the following tools:

- Display panel;
- PPSVIS64 Windows software;
- Integrated web server;
- Smartphone app.

All configuration operations can be performed during normal controller operation, causing no disruption to users. Configuration is done via simple parameter selection and graphical input of the traffic signal timing diagram (with PPSVIS64). The configuration software also supports adding custom user scripts in a C-like language, allowing users to create specialized functions.

It is possible to use a USB pendrive for loading or retrieving data from memory, as well as for firmware updates. All configuration and programming data are stored in non-volatile memory, ensuring data retention even in the absence of power supply.

Applications

Besides its classic use as a traffic signal controller for a single intersection, Orione can be used as:

- Master device of a network of traffic signal controllers;
- System for variable cycle green wave, generated by acquiring data from a network of controllers via serial line or cellular network;
- Wireless Green Wave system with synchronization guaranteed by GPS;
- Interface with devices via MODBUS protocol;
- Integration with third-party systems via RESTful Web API (providing easy and secure access to traffic controller configuration and status);
- Connection to UTC systems using the following protocols:
 - SCAE STCWEB 2.0;
 - OMNIA/UTOPIA (SWARCO MIZARD);
 - SIGMA+;
 - PASPA;
 - NTCIP 1202;
 - MQTT;
 - MODBUS;
 - FALCON;

Diagnostics

Orione includes a set of diagnostic tools designed to provide maintenance-related information such as:

- Type of fault;
- Faulty board;
- Loop detector fault;
- Input fault;
- Burned traffic lamp/module;
- Power reset and instability;
- Power supply voltage too low or too high;

The diagnostic service allows access to internal variables for detailed malfunction analysis. The display visualization, log file archiving, and automatic message forwarding complete the fault-finding support tools.

Structural Features

- Capacity: available in versions for 4, 8, or 12 signal groups in the same cabinet;
- Material: polyester with fiberglass, hot-molded;
- Dimensions: 1150 x 650 x 350 mm;
- Protection rating: IP55;
- Color: RAL7032.

Technical Specifications

- Power supply: 230V/110Vac -20% +15% (42Vac available on request);
- Consumption excluding load: 30 VA at maximum configuration;
- Maximum load: 4000 W;
- Max load per output: 500 W;
- Output protection: 4A type EF;
- Immunity to power dips: 100 ms;
- Operating temperature: -40°C to +70°C.