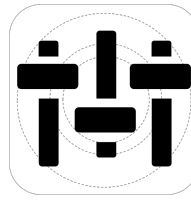


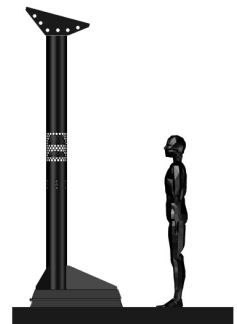
KEY FEATURE
Safety Improvement
at critical locations



TAWS
Train Approaching
Warning System



TAWS® is a simple, automatic and autonomous signaling solution aiming at improving safety by generating light & sound alarm at critical locations of a rail network (schools, community areas, populated neighborhoods, non-guarded crossings, tunnels, blind curves, etc.) to announce a train approaching.



Main Components

TAWS® is composed of :

- A stainless steel pole at each site equipped with beacon, solar panels, batteries, local intelligence and communication device(s)
- A central software to monitor in real time the position/speed of each locomotive and the working status of each TAWS pole
- An specific software for the loco driver using his DMI display or a standalone Android device (smartphone/tablet/etc.)
- An intelligent GPS tracker on board each locomotive
- Data communications devices (GPRS and satellite modem as standard set up, Tetra and VHF are optional)

Technical Specifications

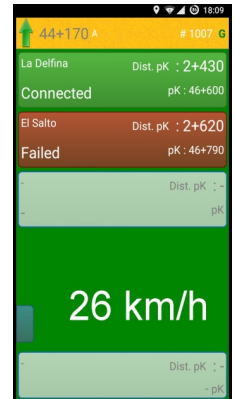
TAWS® pole main components:

Circuit board	Microcontroller-based local intelligence with resilient logic firmware
Light signal	Class1 360° Super-LED flashing beacon
Sound signal	Adjustable high output sounder
SAT modem	Satellite-cellular Communication Terminal
Solar panel	Solar 50W polycrystalline panel
Batteries	Special 12 volt 90Ah dry fit solar battery
Regulator	Solar charge IP65 controller IP65
Security	Anti-theft, anti-vandalism sensors

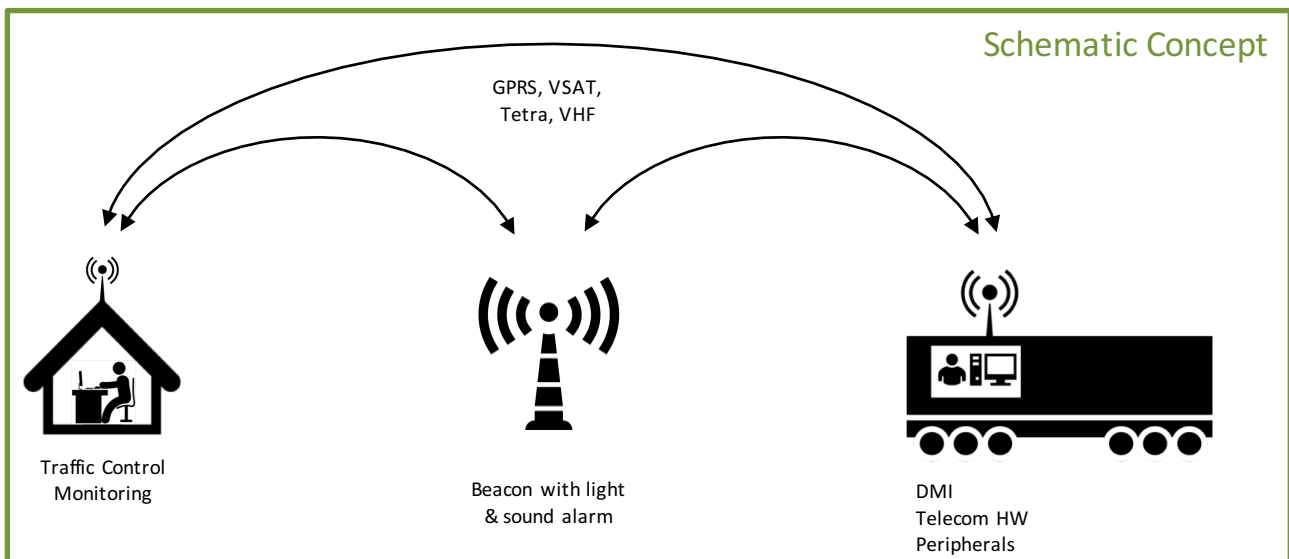
Main Characteristics

TAWS® has been designed to meet challenging operating conditions:

- **State-Of-The-Art** technology
- **Autonomous:** fully automatic operations, self-diagnostic features, no external cables
- **Strategic:** providing critical warning functionality to enhance operational safety
- **Robust:** anti-theft design, onboard technology, limited theft-prone track side equipment
- **Energy-low consumer:** powered by solar energy
- **Innovative:** remote control of local intelligence, individually customizable
- **Connectivity:** may integrate other operational systems such as:
 - ATRAC On-Board ®
 - Train control system providing safe line clearance/authority to proceed
 - Automatic level crossings
 - Motorized rail switches



Driver screen



TAWS Train Approaching Warning System

TAWS® has been designed and prototyped, and now produced by **FUTURE RESOURCES sa**, the Systems Development & Innovation partner of **VECTURIS** and **AURAXIS**, two Belgium-based companies operating small to medium sized railways in Africa and South America. Based on the railway operating experience of its partners, **TAWS®** was developed in collaboration with high-tech railway engineering partners.

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