Satellite Asset Tracking and Fleet Management (SATFM) and SCADA

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SATELLITE OPERATORS

Current Satellite Constellations Suitable for SATFM and M2M:

1. Inmarsat GEO
2. Iridium Big LEO
3. Globalstar Big LEO
4. Orbcomm Little LEO
Iridium Coverage Map with 66 Big LEO Satellites
Globalstar Coverage Map with 48 Big LEO Satellites
Globalstar Coverage Map by GES
Orbcomm Coverage Map with 36 Little LEO Satellites
Orbcomm Coverage Map by GES
Satellite Voice Tracking System
1. Introduction of SATFM & Logistics

Industry analyst Frost & Sullivan in the US predicts in a recent study that the market for fleet management and logistics in North American region will grow to over 4 Billion USD by 2011, what is about 30 Billion Rands. Satellite fleet management in US is in charge about 20 years, and in countries of North Hemisphere is using more than 10 years, while in Southern Africa there is not full Satellite Asset Tracking and SATFM service at present.

Satellite Operators offer global two-way data transfer devices in size as CD players. With its huge reduced consumption of main, solar or battery power this equipment is an effective way of remotely collecting position data from all mobiles and goods and providing logistics.
SATFM Network

GEO/LEO

GES

SATFM Network

GPS/GLONASS

Aircraft

Control Centre

Heavy Vehicles

Oil Trucks

Ships & Containers

Transport Trucks

Cars

Locos & Wagons
Logistics Procedure via SATFM

Mobile unit fitted with satellite terminal uses interactive communications via Inmarsat or LEO satellites, GES and SATFM Ground Network to the Control Centre. At the GES, the RF signals from the antenna are converted into a digital message format and routed via a dedicated line to a Message Handling System at SATFM Network and Billing System.
Procedure 1

Mobile unit can interface many sensors and provide the following functions for land (road and railway) applications:

1. Rolling stock tracking monitoring and location in case of stolen or lost vehicles;

2. Enhancement of Land Traffic Control (LTC) and Land Traffic Management (LTM), logistics, monitoring and control on the roads and railway infrastructure including signalization, important for DOT;
3. Monitoring and logistics of drivers and vehicle performance similar to trip records and control to maximize use of vehicles in time to meet customer’s demands and deadlines, and also detects unauthorized access to driver cabin and cargo using door sensors;

4. Vehicle engine performances can be remotely controlled, monitored and also provided instruction and advices for full maintenance and service;
5. Retrieval data via PC in Office of spot engine irregularities and diagnostics and sending and retrieving PC data on mileage, speed, position, temperatures, engine on/off and fuel consumption of vehicles;

6. Wagons and Trailers ID, location and date and time drop-and-hook notification;

7. Loading operations and casualty analysis, including special control of shipping high value/dangerous loads;
Procedure 4

8. Cargo control and monitoring of temperatures and humidity of perishable fresh goods or frozen products;

9. Enable access to freight information and services, integration of back and front office environment, and analysis of total fleet performance parameters; and so on.

This unit can be also used for Global Ships Tracking (GST) and Global Aircraft Tracking (GAT), Management, Control, Logistics and Monitoring.
1. SATFM Unit is installed in each truck, bus, wagon or container integrated with RFID and additionally can have own 5 to 10 years battery supply.

2. This Unit if has line of sight is able to provide 2 way data communications with Control Centre via Land Earth Station (LES) minimum twice per day.
Inmarsat- C Configuration
Inmarsat D+ Configuration
Other Inmarsat Configuration
Solutions for Wagons
Software Tools

There is a number of desktop, PDA, and server software tools, which significantly simplify the operation and development of a SkyWave D+ application, or an evaluation of the SkyWave D+ System.

PC – Terminal

DMR Scope
Provides a graphical interface to the DMR-200 over the serial connection for:

- DMR familiarization
- Inspecting and changing terminal parameters
- Installation troubleshooting
- Firmware upgrade
- Sending and receiving messages

PDA – Terminal
DVB-RCS for Global SATFM, ITS, SCADA & Logistics

Acronyms:
F-d = Forward downlink
F-u = Forward uplink
ISP = Internet Service Provider
MCP = Mobile Command Post
MIT = Mobile Interactive Terminal
R-d = Return downlink
R-u = Return uplink

C/Ku/Ka-band
Spacecraft

SatLink MIT

F-d

F-u

R-d

R-u

F-d

R-u

F-d

R-u

F-d

SatLink MIT

SatLink MIT

SatLink MIT
Satellite SCADA or M2M for Monitoring Fixed Assets

SCADA - Supervisory Control and Data Acquisition
Who will Utilize SATFM and SCADA Network?

1. State and Provincial Departments:
   DOD, DOT for Traffic Control, Secretariat for Safety and Security, SA Police Service and all other state departments need to improve SATFM, Logistics and SCADA at Sea, on the Ground (Road/Rail) and in the Air, including Safety and Security

2. State and Private Organizations:
   Transnet, ACSA, ATNS, Tourist/Safari Centres, Power/Chemical Plants, Oil Refineries, Geodetic and GIS Organizations, Constructing, Mining and Transportation, Meteorological, Cadastral and Seismic Surveying, Agriculture/Farms, etc
Who will Utilize SATFM & Logistics?

1. Shipping Companies and Ports
2. State and Provincial Departments
3. Private Organizations
4. Police/Military/Intelligent Services
6. Truck, Bus and Rail Companies
7. Taxi and Private Vehicles
8. Insurance Companies
9. Aircraft Companies and Airports
Who are our competitors of SATFM?

The competitors are using GPS via GSM or GPRS and usually provide Asset Tracking only inside of Country. Two companies such as DigiCore (cost of unit is about R12000) and Compass cost of unit is about R9000) are providing Wireless Satellite Asset Tracking and Fleet Management also to cover Country requirements only. The cost of SAT unit is from 1000 to 3500 Rands and the cost of airtime is from 50 to 350 Rands per month.
Current Vodacom Coverage for GSM & GPRS Service
The End

Thank you for your attention!

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