

MIGROS



Pilot Summary

Test Phase: *Euroscan Recorders*



Authors:

Kader Hamrani, Genossenschaft Migros NE/FR
Toni Famos, Zanotti Switzerland Dietikon

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Project Euroscan

Genossenschaft Migros Neuchâtel/Fribourg (GM NE/FR)

1. Initial Position

The employees of GM NE/FR did not utilize a Temperature Monitoring and Truck and Trailer tracking system and as a result did not have the specific experience for the interpretation, application and implementation of a quality assurance systems based on GPRS and GPS in real-time. Therefore, the Euroscan system had to be implemented with great care and an appropriate support agreement with Euroscan was achieved.



The test phase, the support and the system adjustments are complementary of Euroscan and are not binding.

The herewith presented Test Report, Data and Analysis reflect the desires, needs and experiences of GM NE/FR. It however does not encompass the entire range of functionalities and capabilities innate to Euroscan recorders.

2. Catalog of Specifications to Euroscan

- Graphical interpretation of recorded temperature data
- Alarm functions in real-time based on individual settings for upper and lower temperature thresholds.
- Real-time position of individual vehicles
- Driven Route & Geo-Fencing of individual vehicles

3. Test-Configuration

- Euroscan Temperature recorder, equipped with GPS- and GPRS/GSM-Modem incl. data transfer card (SIM Card)
- Service and data transfer provided by Orange Communications
- Machine-to-Machine Server application by Euroscan (Euroweb)
- Data transfer-Rate: every 10 Minutes (GPS- and Temperature Data)
- Integrated Alarm functions (server based), which allow for adjustability of individual Parameters

- Not installed: EuroLOG - a Software package which allows for the complete analysis and reviewing of individual temperature readings as well as the automation of certain analysis.

4. Functionalities of Euroscan

4.1 Temperature Measurement

The temperatures are measured every second and saved in the recorder. The average is calculated every 10 minutes (based on the data transfer setting) and made available for the data transfer.

4.2 Position Data

The GPS Antenna constantly acquires geographical position changes, which are saved in the central recorder's hard drive and made available for data transfer.

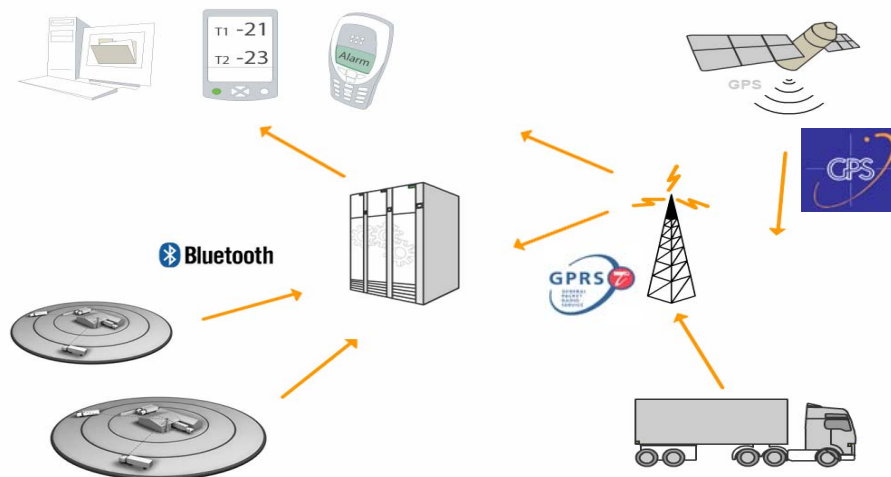
4.3 Data Transfer

The collected temperature and position data are transmitted to the central server every ten minutes (based on the adjustable presetting), which then in turn prepares the collected data for analysis.

4.4 Data Display

Via a username and password secured internet site access to live-data can be granted and parameter settings changed. Real-time location and temperature readings are available.

Chart 1: Functionality of Euroscan (Real-Time Data, Alarms & Quality Analysis)



5. Test-vehicles

5.1 „Camion“

Mercedes-Box truck with Frigoblock-Reefer FK 13 L, Euroscan Model RX2, 3 Temperature sensors (T1, T2 and T3). Total installation and startup time: ca. 6 hours
Cabin-mounted Euroscan Unit (in the driver's line of sight)



5.2 „Semir.“

Trailer Frech-Hoch with Frigoblock-Reefer HK 13, Euroscan Model TX2, 3 Temperature sensors (T1, T2 and T3) Total installation and startup time: ca. 2.5 hours
Trailer-mounted Euroscan Unit (directly below the reefer, not in driver's line of sight)



6. Persons Involved

Mr. Kader Hamrani (GM NE/FR)
Mr. Edgar Leibzig (GM NE/FR)
Mr. Toni Famos (Zanotti, Switzerland)

7. Project Developments, Experiences & System-Adjustments

April 2005

Initial contact by Toni Famos with Mr. Edgar Leibzig and Kader Hamrani

May 2005

Collective visit to the Transport Logistic Exhibition in Munich, Germany

June 2005

Installation of Euroscan Test Units on two vehicles

7.1 Problem 1:

The temperature recorder RX2 „Camion“ transmitted data that did not reflect actual events.

Solution:

The metal antenna cable extensions were not sealed. This caused contact to the steel parts of the body after the installation. Proper insulation solved the issue immediately. All further installations were equipped with the necessary insulation.

June 2005

After the successful installation and implementation visual data analysis was available immediately. Temperature and vehicle positions are very transparent through the Web-Solution.

June-August 2005

Transmission of the transportation data to the Euroscan-Demo server. Shortcoming of this particular server: the possibility for GM NE/FR to set, change or delete Alarms was not yet available. (Alarms in Real-Time, either via email or SMS).

As of July 2005

Alarm functionality after activation was established, applied settings through Euroscan Bonn.

7.2 Problem 2:

Alarm functionalities were not satisfactory, had to be activated through Euroscan Bonn, according to GM NE/FR specifications.

Solution:

Euroscan installed a new server, which allowed these individual functionalities.

August 15th 2005

Switch to the new Euroweb-Server, which allows individualized access and parameter settings for GM NE/FR (and all subsequent clients).

7.3 Problem 3:

The Euroscan TX2 „Semir.“ on the trailer is directly connected to the Reefer Unit, but Frigoblock’s Reefers do not have independent battery power. This created the situation that the Euroscan unit only had sufficient power supply to transmit data when the Frigoblock Reefer is turned on or powered by an external power supply or generator and created “holes” in the graphical charts. Saved data was not lost since Euroscan Units are equipped with an internal battery specifically designed to save data when external power is not available.



Solution:

The trailer was equipped with a battery and charger that charged the battery as soon as a power supply is available. (Battery CHF 70.-, approx. \$53. Charger CHF 35.-, approx. \$26.)

Note:

At this point in time all Euroscan works as Mr. Hamrani expected. The exception is the Alarm functionality. The Alarm Server provides invaluable Information about: a) the temperature in Cold-storage areas, b) the desired temperature of the transport vehicles, c) loading habits, d) the sensibility of products, e) as well as knowledge about the actual functionality of the reefer unit and how it reacts to certain parameter changes. The Alarm Server Settings are a customer specific „learning experience.“ Mr. Hamrani has the capability to effortlessly distribute and share this information with the necessary employees at GM NE/FR.

8. Solving the customer Alarm Server Settings in Real-Time

September 2005

Problem:

The data obtained, the advantages and experiences are not displayed here. We would, however, be pleased to show them to you on the occasion of a private discussion.

8.1 Interpretation:

8.2 Conclusion:

Chart 2: Example of an Alarm Message via E-mail

-----Message d'origine-----
De : alert@euroscanweb.com [<mailto:alert@euroscanweb.com>] Envoyé : mardi, 11 janvier 2006 05.32 À : GMNEFR Logistique Transport Objet : migros

Vehicle: Semir.
S/N: 11300112
Date/Time: 11/01/2006 05:32

Message: Temperature of input T2 has reached -0.9°C and has been lower than 0.0°C for 10 minutes.

Chart 3: Alarm Protocol (Function „Event“)

Vehicle : Semir.		Recorder : 11300112	
Number of Events : 11			
Date	Time	Type	Sensor / Input
11.01.2006	08:03:00	Temperature alarms switched off	1,2
11.01.2006	06:42:00	Temperature alarms set 1,0 < T1 T2 < 6,0 delay 45	1,2
11.01.2006	06:28:00	Temperature alarms switched off	1,2
11.01.2006	05:42:00	Temperature alarm confirmed	Entree Air
11.01.2006	05:41:00	Temperature alarms set 1,0 < T1 T2 < 6,0 delay 45	1,2
11.01.2006	05:39:00	Alarm Temp Off	Entree Air
11.01.2006	05:39:00	Temperature alarms switched off	1,2
11.01.2006	05:32:00	Alarm Temp On	Entree Air
11.01.2006	04:47:00	Temperature alarms set 1,0 < T1 T2 < 6,0 delay 45	1,2
11.01.2006	04:37:00	Temperature alarms switched off	1,2
11.01.2006	04:37:00	Temperature alarms set 1,0 < T1 T2 < 6,0 delay 45	1,2

9. Benefits for GM NE/FR (during Test Phase)

The data obtained, the advantages and experiences are not displayed here. We would, however, be pleased to show them to you on the occasion of a private discussion.

10. Conclusions of the Test Phase

With the exception of the initial problem relating to the wiring of the temperature sensors, the Euroscan recorders functioned properly and as expected once they were installed. Rare occasions do exist during which, due to minor technical problems (i.e. Software updates for the Server), live-data cannot be viewed, but this does not affect the customer version.

Problems 2 and 3 were related to the Alarm Server and its Alarm Settings whose set-up was unique to Migros. Euroscan was capable to quickly and accurately address the problems that arose and was able to provide satisfying solutions. The initial difficulties lay in the interpretation of the Temperature Curves, and later



with the correct settings for the Upper and Lower Temperature Limits in connection with the time-delayed alarm messages. The alarm settings had to be adjusted in order for the Alarm server to distinguish between temporary and normal spikes and drops of the Reefer unit versus actual temperature related problems in the load and with the trailer.

The now implemented and mature system is fully functional and runs stable. Furthermore, the incoming Alarm Messages are correct and represent actual temperature problems that are occurring within the fleet.

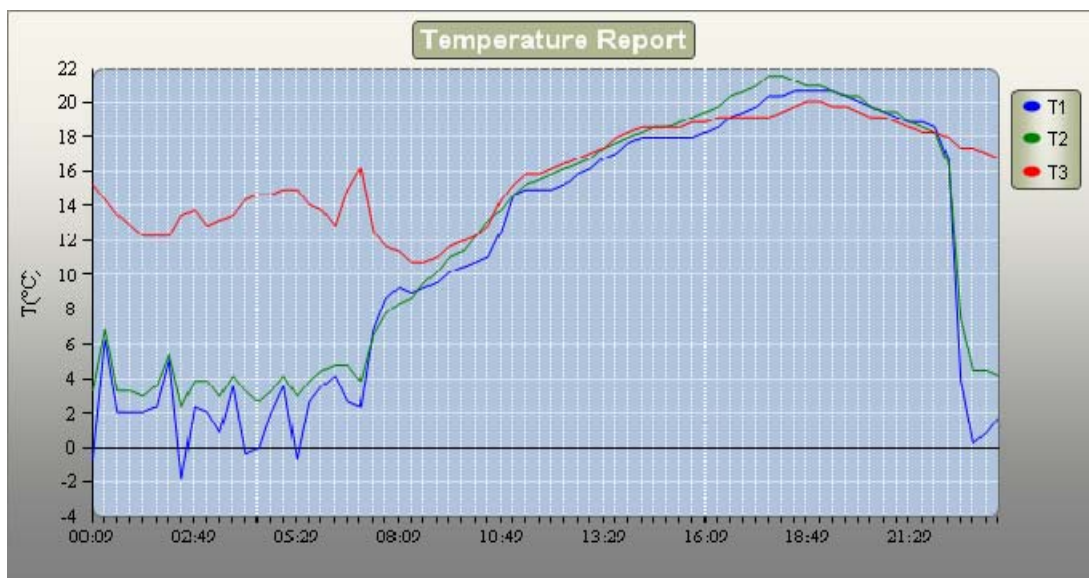
The learning curves of both End-user and system supplier have been great and the temperature recorders have become a valuable and vital tool.

The Euroscan recorders meet all Swiss and European standards, regulations and quality requirements. Open data interfaces (SQL- Database) allow for easy integration and compatibility of the units and the data generated into other open-source IT systems. The Euroscan recorders also allow for various combinations in terms of Data transfer (i.e. Bluetooth and GPRS) which can be of interest in the future for clients such as Migros.

Many Swiss, as well as most European Trucks are already equipped with Euroscan recorders. This allows Migros the possibility to receive as well as transfer data from Suppliers and to centrally store the data along with other relevant product information.

11. Appendix

Chart 4: Example of Graphical Representation of Temperature Curves



Legend: T1 = discharge air from the Reefer unit
T2 = Return air for the Reefer (warmed through the product)
T3 = unconditioned area behind partition wall (dry goods)

Effective quality control is only possible with a minimum of two Temperature sensors, located in different parts of the trailer. This enables one to accurately determine if the loaded goods have been stored and cooled properly. With the two temperature sensors we can eliminate quality problems related to goods being stacked to high or Reefer units that do not work effectively, since T2 (green curve) would otherwise show a colder temperature than T1 (blue curve).

Chart 5: Example of GPS position of a Vehicle in Real-Time

