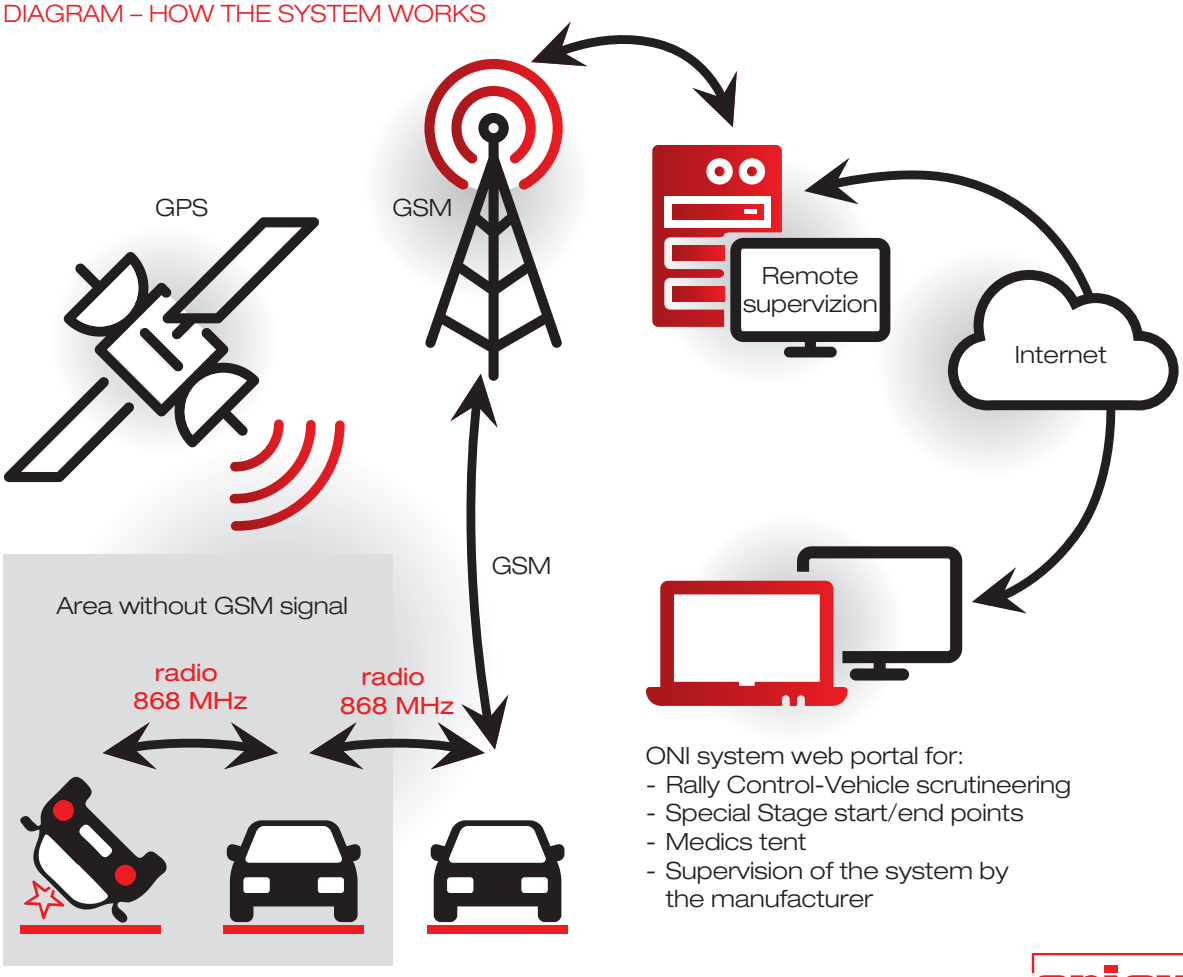
RALLY SAFETY AND ORGANIZATION

ONI SYSTEM - RALLY MONITORING

In 2019, NAM system (under the ONI system brand name) developed its 4th generation of Rally Monitoring Units, based on eleven years of experience since NAM first deployed these units in 2008. This solution provides fast installation including a system control test that is carried out within 2 minutes, has controls that are within reach of the driver / co-driver and offers simple operation. The unit display shows the distance to cars that represent an obstacle on the track and the distance to accidents or SOS calls. The unit has a function that evaluates the strength of G-Force when an accident occurs. Data is also transmitted in places where there is no GSM signal (cars act as repeaters passing the data onwards until GSM coverage is found. Race organizers can also send red flag messages to the cars. The system is complemented by wireless reconnaissance units designed for personal cars.

DIAGRAM – HOW THE SYSTEM WORKS



ONI system web portal for:
- Rally Control-Vehicle scrutineering
- Special Stage start/end points
- Medics tent
- Supervision of the system by the manufacturer

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SIMPLIFICATION OF RALLY ORGANIZATION

Instant overview

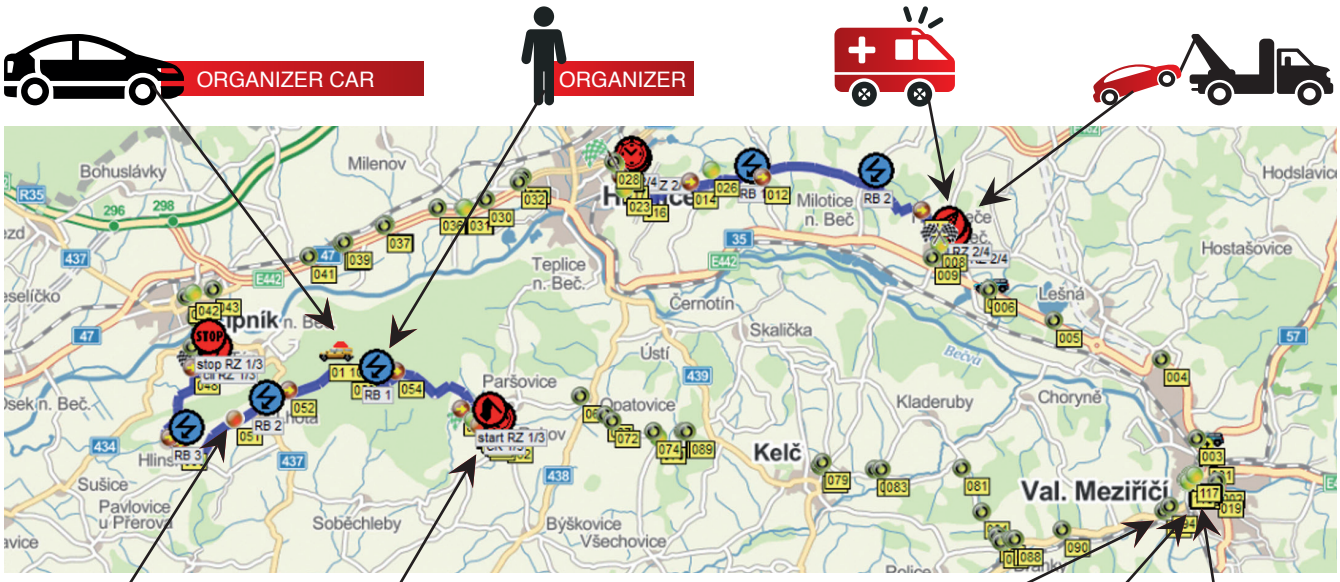
ONI system units installed into the cars send data to the portal, which the organizers access through the Internet. Thanks to the web portal www.onisystem.net controllers have an overview of the online movement of individual vehicles. Rally Control and the crews on the track automatically receive information about any accidents, SOS messages (sent by crews in distress) or cars representing an obstacle on the track. The oncoming crew can see the distance (to the accident/SOS/obstacle). If the crew needs assistance, a siren alerts the crews to this.

BENEFITS FOR RALLY DIRECTORS AND ORGANIZERS:

- Overview of:
  - racing cars
  - zero cars
  - ambulances
  - tow trucks
  - organizer cars
- Option to send RED FLAG to all cars on a specific SS or to selected cars only
- Acknowledgment of RED FLAG declarations

MONITORING SYSTEM SPECIFICATIONS:

- Web portal with online data and Google maps
- Car position on the map updated every 5 seconds
- RED FLAG messages to the car - received within 2 sec.
- Telephone support of the Organizers



RALLY PREPARATION

GSM signal quality measurement and reconnaissance

Before each race GSM signal coverage is measured. In places where there is no GSM coverage, messages are sent via radio. Information about accidents and SOS messages is transferred between cars and once one of these cars is in range of the GSM signal, this information is forwarded to the Rally Control. Access to the Rally Control is secure and is not accessible to anyone else via the GSM network.

RALLY PREPARATION:

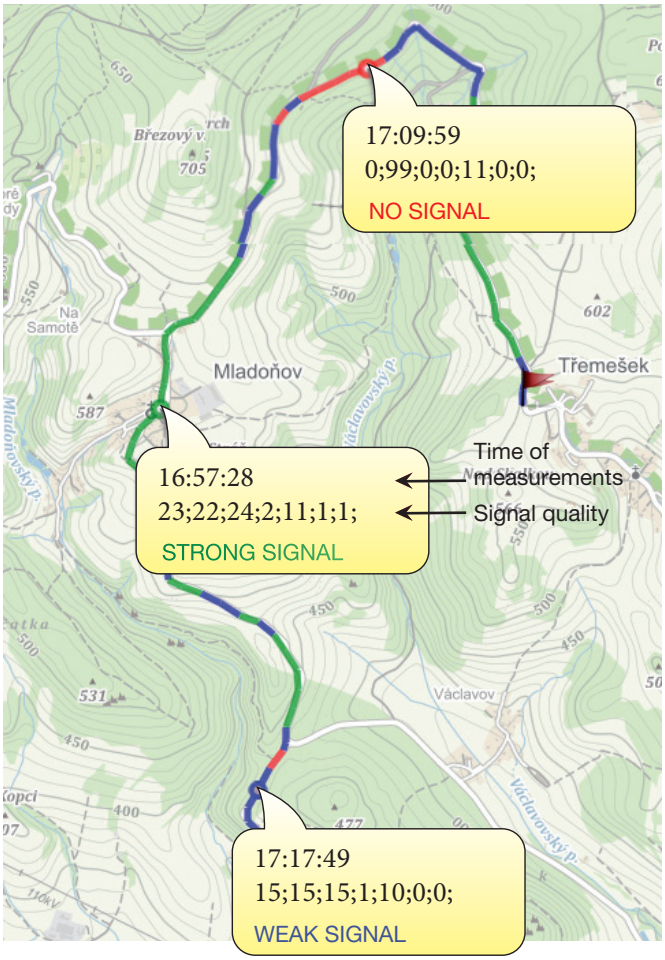
The “RECORD” unit shown below is used to define Special Stage start and finish points. Special Stage start and finish points are then configured into rally units when they are installed into the rally cars. This ensures that automatic detection of stops during a special stage, determination of the distance to an obstacle and the quick selection of cars currently on a specific special stage are working.

RECORD unit

RECONNAISSANCE

All drivers and their navigators have the right to drive through the Special Stage route several times before the race. Crews drive in normal road traffic and so must observe traffic regulations and ensure the safety of local residents. To ensure that rules are not broken during reconnaissance, the rally organizer gives each crew a unit that checks speeds driven during reconnaissance. These units are battery powered with no cables, connectors, external antennas or switches. The organizer turns them on, gives them to crews and collects them at the end of the reconnaissance. If any crews do not respect traffic regulations, they will be fined according to the organizer‘s rules.

Overview of GSM coverage



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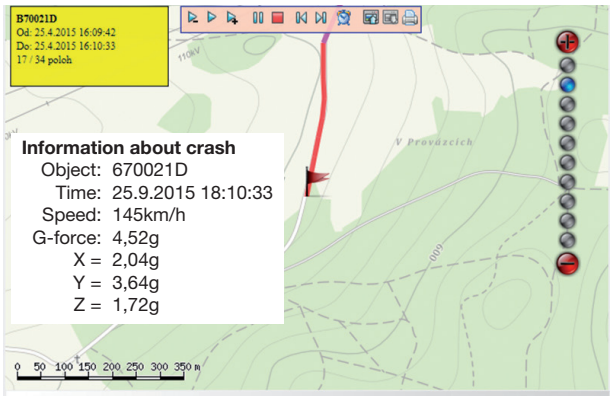
ACCIDENT DETAILS

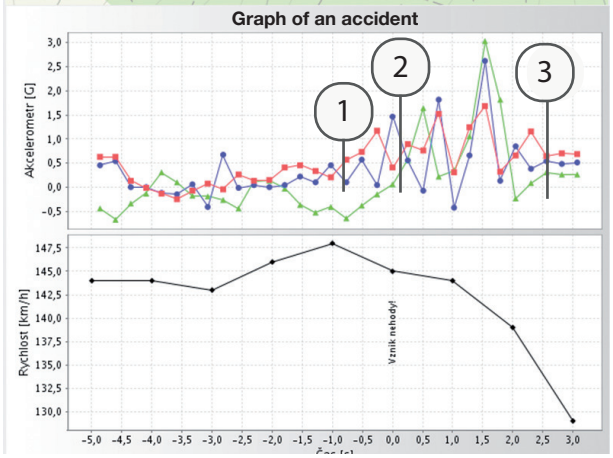
Location, G-Force and speed

If the unit detects high G-Force and at the same time the vehicle stops, this event is evaluated by the system as an accident incident and sent to Rally Control as such. The size and time-line of the G-Force are sent to the portal.

HIGH SPEED ACCIDENT BUT WITH LOW G-FORCE

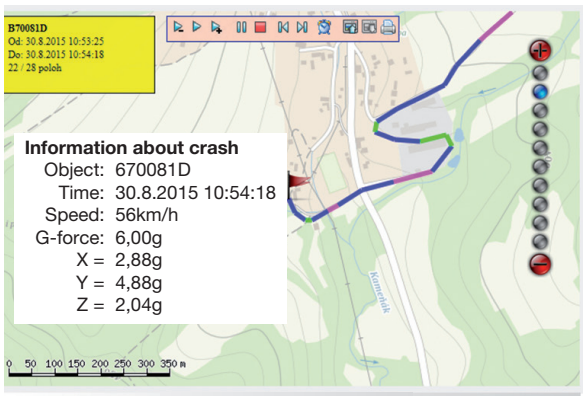
Nothing happened to the crew

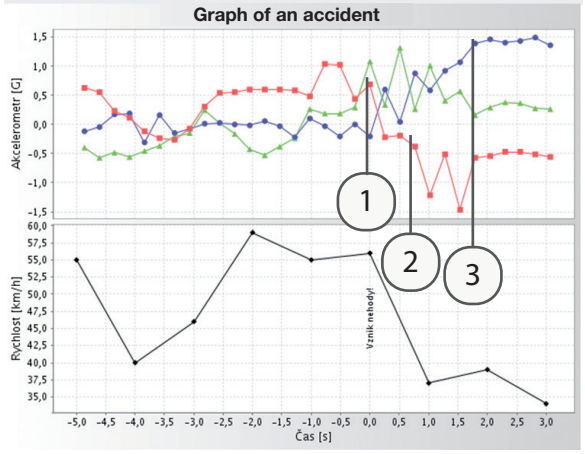




LOW SPEED ACCIDENT BUT HIGH G-FORCE

The car overturned on its side – the crew could be in danger





PROVISION OF RALLY MONITORING

LEASING AND TESTING

How to provide rally monitoring in your country?

1. Find the rally monitoring operator in your country. This will be an organization that has bought the system, takesit to the rally, hands it out before the rally, collects it after the rally and provides technical support during therace.
2. Let ONI system calculate a price offer for the purchase and operation of the units for you.

TRY OUR RALLY MONITORING SYSTEM BEFORE PURCHASE

Come to the Czech Republic for any particular rally. We will arrange for you to spend time with the organization that works with the Czech Auto-club and provides rally services for all Czech rallies. You can try handing out units before the rally, working in Rally Control and collecting units back after the rally. We can also assist with arranging accommodation. Contact: **Jan Regner, jan.regner@czechrally.com**.

Activities of each individual rally department

Rally monitoring operator in your country:

- Ensures PC + internet connection at the scrutineering area
- Defines the starting numbers of cars for the rally project
- Gives out units before the race
- Keeps a record of which car has which unit
- Collects fees for renting units (if this has not already been included in the entry fee)
- Collects deposits or driving licenses for the rented unit
- Checks, during scrutineering, that units are switched on and operating correctly
- Collects units after the rally, returns deposits / licenses
- Checks returned units Sends damaged pieces to be repaired

Rally organizer:

- Ensures that Special Stage routes are recorded by the RECORD unit
- Ensures setting of start and finish points

Activities of Rally Control:

- Ensures PC + internet connection
- Evaluates accidents
- Communicates with the Clerk of the Course
- Radio point communication
- Declares red flag, stops Special Stages / finishes the stage on the instruction of the Clerk of the Course

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TECHNICAL PARAMETERS OF THE SYSTEM

Technical specification – hardware

Racing unit type:	NCL20 - BIRally
Power voltage	10 - 17 V
Average power when the display is on	140 mA/12V
Maximum power consumption when the battery is charging	450 mA/12V
Operating temperature	-15 to 65 °C
Temperature range for battery charging	0 to 50C (outside this range charging will turn off)
Unit size without bracket and without antennas	115 x 90 x 84 mm
Unit weight without bracket	420 g
Weight of bracket including coupling	325 g
GSM communication channel	850/900/1850/1900 MHz GSM phase 2/2
RADIO communication between cars	868 MHz / 0,5 W
Communication channel SOS panel - unit	2,4 GHz
GPS antenna connector	SMA
GSM antenna connector	FME
Antenna	868 MHz and 2.4 GHz integrated on the box
GPS receiver type	QUECTEL L 72
GSM modem type	QUECTEL M 95
Internal battery	1000 mAh / 3,6 V, 3 years service life

Technical specification - safety function of the racing unit

Automatic crash detection in SS and Transfer modes	YES
Crash detection reliability	99 %
Crash generation time / crash transmission time to the server	YES/YES
Graph of the G-Force strength during an accident (at all 3 axes) in periods of 250 ms	YES
Duration of detailed accident report recording	8 sec.
Measurement of maximum G-Force during an accident	YES
Transmission of the accident report graph to Rally Control	YES, up to 15 sec.
Transmission of accident information to vehicles on the Special Stage that are behind the car involved in the accident	YES
Operating time of the unit using the internal battery when the main power supply is disrupted	60 mins
Warning to crew that they may represent an obstacle on the course	audio and optical
Red flag message transmission time to cars	2 sec.
Number of emergency message types	3 (crash – no response from crew, SOS, stop on SS – no response)
Minimum / normal range for SOS RADIO 868 MHz signal capture	400 m / 1000 m
Duration of time that SOS and accident messages are transmitted	20 minutes
Max. number of repeaters for transmission of SOS and accident messages	7 via RADIO 868 MHz
Duration of time that display runs for if the main battery is disconnected	5 minutes

TECHNICAL PARAMETERS OF THE SYSTEM

Technical specifications - race preparation, race organization

Archiving of race history, Special Stage routes and speeds of each vehicle	10 years
The maximum number of stages in a rally for which the START and FINISH points can be defined	32
SELFTEST details recorded on PC	date, time, type, errors
Number of GSM operators via which the unit can work	1-7 (according to country)
Measurement of GSM signal availability on route	YES
Frequency of vehicle position sending on Special Stage / Transfer via GSM	6 sec.
Number of types of informational messages	6 (accident - we are OK / we are not OK, SOS, we are on SS - we are not an obstacle / we are an obstacle, red flag)
Special Stage number information	shown on the display
Distance travelled from the start point of the Special Stage	shown on the display in km in steps of 100 m
The unit works on 868/868 MHz and 868 / GSM retransmission	YES
The display can be shown in these languages	English, German + local language

Web application operation

Operation of servers - Professional data centre Czech radiocommunication	Praha, Czech Republic
Backup servers available	YES
Time taken to switch to backup servers	10 minutes
Supervision of operations	24/7
Remote race support, phone, e-mail, SKYPE, WhatsApp	YES

Technical specifications - reconnaissance units

Dimensions	86 x 51 x 30 mm
Weight	165 g
Battery operation	min 1500 km
Stand-by when not moving	260 days
Works inside the car	YES
Integrated GPS and GSM antenna	YES
Manipulation detection (if someone tries to remove from the car)	YES
Locations kept in memory when no GPS signal is present	YES
Charging time (from 0% to 100%)	4 hours
Transmission of battery status	YES
Number of units in transport case	32

SOS panel and OK button

Power voltage	3 V
Battery	CR 2032
Operation	transmits 1x every 80 s
Endurance	2 years nonstop
Weight	20 g
Dimensions including SOS button	113 x 68 x 62 mm

SOS panel back-plate (holder)

Dimensions	113 x 68 x 5 mm
Weight	45 g

NAM SYSTEM

30 years of monitoring technology development

ONI system is a trademark of NAM system, a.s., a renowned manufacturer and supplier of in-house hardware and software technology for monitoring solutions.

We have been operating on the market since 1990 and focus mainly on security applications. We offer technologies and services designed for guarding and monitoring stationary and mobile objects. These are in-house product solutions – Alarm Receiving Centres (ARCs), vehicle location monitoring systems and communication equipment for data transmission in various applications. To ensure greater security, we use not only GSM networks (of mobile operators), but also our own radio network (with nationwide coverage).

REFERENCE:

Rally monitoring operator in the Czech Republic:
Rallye Zlín spol.s r.o. Contact: Jan Regner, jan.regner@czechrally.com, www.rallyzlin.cz

RALLY MONITORING EXPERIENCE:

2007 - 2020
Barum Czech Rallye Zlín
One of the most important motoring events in the Czech Republic.
www.czechrally.com

2007 - 2018
AUTOKLUB
CZECH REPUBLIC
This is a member of these international organizations:
FIA, FIA/CIK, FIM, UEM
www.autoklub.cz

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DO YOU WANT TO USE ONI SYSTEM TO IMPROVE RALLY SAFETY? CONTACT US!

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