



elektrosistem



ISN BLACK BOX

The **Black Box** is a system designed to control the use of vehicles and record operating data and anomalies. It includes a "Logic Part", a "Display" and a "Current sensor".

The *Logic part* is housed in a IP65 metal box and is the system main part. It is equipped with a triaxial impact sensor and can accept a wide range of input voltages making installation very easy.

The *Display* includes a RFID reader and when connected to the logic part through a 2 mt cable included in the equipment is used to:

- 1 - receive signals from the transponders in the vicinity
- 2 - act as interface between PC and logic part using a simple USB cable
- 3 - act as audio-visual warning device to inform about possible anomalies
- 4 - supply power to the logic part during the data processing from PC through the USB cable.

The Hall effect *Current sensor* is easy to install and does not require changes to the original power wiring on the vehicle.

The **Black Box** system also offers options to guarantee high safety conditions for the user, including the vehicle lockout in case of impact when the pre-set values are exceeded, the main contactor opening in case of anomalous current draw, or the contact opening when the pre-set value for inclination is exceeded. In conditions like those just described the system also warns the operator with acoustic or visual signals through the *display* and records operating parameters. The data stored can be downloaded in Excel format connecting a PC to the *display*, in order to make the error analysis for the maintenance manager and the vehicle fleet controller simple and accurate.

When the **Black Box** is fitted on a vehicle it is possible to allow operation only to the user having the pre-stored RFID transponder thanks to the *display* reading function and in addition it is possible to identify the user and to check how the vehicle has been used. The system can handle the access of a large number of users through a password associated to each user profile in order to prevent the access to non authorized operators.

Max 200 users can be stored in the system. A user name can be associated to each transponder and the type of user can be set according to the profile used.

The **Black Box** can store the following data:

- 400 events for **Device switched on**, recording date, time, battery level, and hour meter each time the battery plug is connected and disconnected. In addition also Amps/hour used, max. current reached during operation and average current are stored. When more than 400 events have occurred, the last 400 ones are stored in the memory while the older ones are cancelled.

- 800 events including impacts, full battery indication, low battery indication, partial battery charge indication (opportunity charge), max. inclination allowed exceeded, and max. current draw allowed exceeded. The system errors indicate date, time, battery level, hour meter, state of the inputs, state of the outputs, cause for the event, user name and transponder number if present, acceleration value for the 3 axis, vehicle inclination and current draw by the battery. When more than 800 events have occurred, the last 800 ones are stored in the memory while the older ones are cancelled.

- 600 events for **User presence** recording date, time, battery level when the user starts operating the vehicle and when the user leaves the vehicle, partial hour meter, Amps/hour used, max. current, average current, user name and transponder number. When more than 600 events have occurred, the last 600 ones are stored in the memory while the older ones are cancelled.

~~NEWS~~**TECHNICAL SPECIFICATIONS**Logic part

PARAMETER	VALUE			UNIT OF MEASUREMENT
	MIN	TYPICAL	MAX	
BOX	Aluminium housing, with flange			
DIMENSIONS	110 x 82 x 44			mm
PROTECTION RATE	IP65			
POWER SUPPLY	10		200	V
OPERATING TEMPERATURE	-25		+85	°C
CURRENT DRAW	Min 14 - Max 260			mA
RTC BATTERY	1			Lithium CR1220
PROCESSOR	8 bit, 8051			
PROGRAM MEMORY	64			Kb
PROCESSOR FREQUENCY	50			Mhz
DATA MEMORY AND PARAMETERS	256			Kb
(NO/NC) RELAY OUTPUTS				
NUMBER	4			
DC RATED VOLTAGE			250	V
CONTINUOUS LOADING CURRENT			8	A
INPUTS				
NUMBER	8			
INPUT IMPEDANCE			300	K Ohm
POSITIVE INPUT VOLTAGE	5		200	V
NEGATIVE INPUT VOLTAGE	0		1	V
MOSFET OUTPUT				
NUMBER	4			
RATED CURRENT			500	mA
DC RATED VOLTAGE			200	V
12bit ANALOGUE INPUTS				
NUMBER	2			
INPUT VOLTAGE	0		10	V
INPUT IMPEDANCE	1			M Ohm
ACCELEROMETER				
NUMBER OF AXES	3			
MAX ACCELERATION PER AXIS	-6		+6	G
INTERFACE				
SPI FOR THE LOGIC PART	1			
CANBUS	1			

~~NEWS~~

Display

PARAMETER	VALUE			UNIT OF MEASUREMENT
	MIN	TYPICAL	MAX	
BOX	black ABS housing, with flange			
DIMENSIONS	80 x 40 x 20			mm
PROTECTION RATE	IP42			
POWER SUPPLY		5		V
OPERATING TEMPERATURE	-25		+85	°C
TRASPONDER READER				
FREQUENCY	125			KHz
SUPPORTED TRASPONDERS	EM4000 - HitagS - Hitag1 - Hitag2			
INTERFACE				
SPI for the logic part		1		
USB 2.0 for Host		1		

DIMENSIONS AND MOUNTING HOLES

