



# TOM

Digital-Audio-Video

Driving Data Recorder  
Safety Functions

DATA SHEET



## HIGH-PERFORMANCE PROCESSING

TOM's powerful features bring driving monitoring to a whole new level, whether it be video recording, storage capacity, cyber protection, or safe driving operations. The hardware modularity and advanced configuration features give TOM great flexibility to meet the needs of all types of rail vehicles.

## CUSTOMER BENEFITS

Flexibility for all train, metro, LRV platforms

Time savings during implementation

Long lifetime of storage media

Better driving analysis



## NEW STANDARD FOR MODERN RECORDING

- Driving-focused video and audio recording, combined with regular data recording, greatly enhances understanding of driving events.
- High-performance features designed to meet future IEC-EN 62625-Part 3
  - 4 built-in PoE ports for cameras
  - Up to 128 GB crash protected memory
  - 1 extractable SSD

## HIGH SPEED CONNECTIVITY

- Live video streaming, telemetry and automatic download
- Integrated 4G/5G modem and Wi-Fi module

## FASTER CUSTOMIZATION

- TOM's recording and safety features can be implemented quickly by your own system engineers

## OUR KNOW-HOW COMBINED WITH RELIABILITY

- Strong expertise in safety (SIL2/SIL4) and cybersecurity (SL2)
- 25 years of data recording and CCTV experience

## SPECIFICATIONS

### RECORDING

Base  Option

Crash Protected Memory	<input checked="" type="radio"/>	Size 8 .. 128GB Lifetime: 20 years ( <i>Video+Audio+Data at 10 Mbits/s write to a 64 GB memory</i> ) Resistance: fire 650°C, crush 110kN, shock 55g, immersion 15m
Extractable Memory	<input type="radio"/>	Size: 128 GB .. 4 TB, SSD technology Key lock
Audio/Video Inputs	<input checked="" type="radio"/>	Audio/Video streams from train network
	<input type="radio"/>	Cameras: 4 x 100 Mbits/s Ethernet ports with PoE - M12 socket Microphones: 2 x dedicated ports
Digital/Analog Inputs	<input type="radio"/>	Digital inputs: 16 .. 80 ports Analog inputs: 4 .. 12 ports Frequency inputs: 4 .. 6 ports
Train Network Vehicle Bus	<input checked="" type="radio"/>	Fast Ethernet: 2 x M12 ports Protocols: TRDP (IEC61375-2-3), CIP, IPTCOM
	<input type="radio"/>	MVB Class 1.0/2.0 port or CAN 2.0 port 2 x RS485 - 2 x RS422
Maintenance	<input checked="" type="radio"/>	Fast Ethernet RJ45 port USB3 port
Wireless Connectivity	<input type="radio"/>	GNSS receiver: GPS - GLONASS - GALILEO - BEIDOU WAN modem: 4G - LTE WLAN device: Wi-Fi 5 (b/g/n/ac)

### SAFETY FUNCTIONS

SIL-4 Controller	<input type="radio"/>	SIL-4 driver vigilance monitoring SIL-4 low speed detection Customization capability: parameter adjustment
SIL-2 Controller	<input type="radio"/>	Built-in SIL-2 functions: speed measurement, speedometer output, speed thresholds, over speed protection, rollback protection, standstill monitoring, platform clearance zone detection, and driver vigilance monitoring Customization capability: Configurable block assembly

### GENERAL

Services	<input checked="" type="radio"/>	Local and remote data transfer Audio/video streaming Embedded website for maintenance purposes Recorder and safety functions configuratio
Data Plugs	<input type="radio"/>	Train parameter plug: vehicle-related parameters
	<input type="radio"/>	TOM configuration plug: vehicle and device related parameters + configuration, software and security packages
Peripherals	<input type="radio"/>	Speed sensors and indicators Microphones and cameras
Power Supply	<input checked="" type="radio"/>	Power input 24 - 110 Vdc Sleep mode management
Mechanical Characteristics	<input checked="" type="radio"/>	483 x 133 x 280 mm <13kg
Standards	<input checked="" type="radio"/>	IEC/EN 62625: On-board driving data recording system EN 50126 - EN50129 - EN50128: Safety certification - SIL-2/4 IEC/EN 62443: Cybersecurity - security level 2 IEC 60571/EN 50155: Electronic devices IEC 62236-3-2/EN 50121-3-2: EMC

### CONTACT

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**WABTECCORP.COM**

# SAFETY SYSTEMS & EVENT RECORDERS **IEC/EN SOLUTIONS**

## **WABTEC'S IEC/EN SAFETY SYSTEMS & EVENT RECORDERS**

Wabtec is a leading supplier providing railway solutions. Safety of train operations has always been a part of our strategy.

We provide innovative safety systems and event recorders to all types of rail worldwide.

Specifically, Wabtec has dedicated a product family, fully compliant with IEC/EN standard applications. To help provide the most suitable answer to the customers applying these international standards.

## **+40**

**Years of experience**  
Supplying robust and reliable advanced electronics

## **OUR EXPERTISE**

With its IEC/EN solutions, Wabtec provides extensive expertise in embedded electronics that includes:

- Safety developments up to SIL 4
- Cybersecurity up to SL2
- Advanced recording of driving events and audio/video
- High-performance IEC/EN crash protected memory
- Train speeds processing
- Train safety automation



# EVENT RECORDERS

Driving Data and Video Recording

*Improve the safety*

## IMPROVE SAFETY & PREVENT ACCIDENTS

Wabtec provides a flexible and scalable range of systems addressing all customer applications contexts.

All solutions offer IEC/EN advanced event data recording with the support of optional audio/video recording features (IEC/EN 62625-3 ready), with the ability to store data in high performance crash protected memory.

All our recorders can be complemented by a set of peripherals to meet customer's needs and offer an all-in-one solution.

## AVAILABLE FOR ALL TRAIN CONTROL SYSTEMS

Extensive interfacing capabilities with TCMS (e.g., TRDP – with dual homing, MVB), and signaling systems (e.g., ETCS or CBTC).

## DATA ANALYSIS - AN END-TO-END VALUE CHAIN

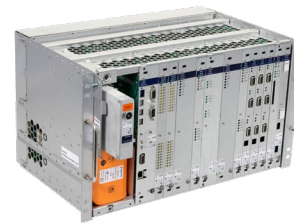
The on-board solutions are supplemented by a suite of application tools.

**SAM** application is dedicated to graphically analyze data recorded files. It offers to mix driving data events with audio video footages to have a full view of the context of an accident during an investigation.

**ADS suite** is a cloud-based solution proposing a fleet management application suitable for driving data automated collection and analysis of driving events.



**TOM**  
Digital audio video recorder



**ATESS**  
Dedicated to French main lines

## RANGE OF PERIPHERALS



Wheel speed sensor



Radar



Speed indicator



Audio-video capture



Connectivity



**SAM**  
User-friendly data driving analytic software



**ADS - cloud services**  
Automated detection of driving anomalies





# SAFETY SYSTEMS

## Train Speed Processing & Automation

Enhance safety of train operations up to SIL4

Standalone or integrated in the event recorders, Wabtec offers solutions suitable for train speed processing and train safety automation.

### TRAIN SPEED PROCESSING

Wabtec offers a large range of solutions related to train speed processing. From wheel speed sensors to intercorrelation radars, Wabtec covers a wide range of speed and distance measurement applications.

In the context of ETCS, Wabtec has also developed a strong expertise in SIL4 odometry applications by designing certified systems based on sensor fusion.

### TRAIN SAFETY AUTOMATION

Wabtec also provides a set of SIL2, SIL4 automated safety solutions: dead man vigilance, overspeed detection, rollback control, train positioning.

Special focus is placed on onboard applications interacting with the wayside through dedicated beacons. Wabtec provides “all-in-one” solutions (e.g. platform docking, type B signaling functions).

The solutions guarantee the safety compliance without compromising the system availability.

The customization of these safety systems allows for a quick personalized configuration.



**WHEEL SPEED SENSOR**  
Passive or active technology



**SPEED MEASUREMENT RADAR**  
25 years experience in Doppler technologies



**SIL-4 ODOMETRY**  
High availability with sensors diversity



**SPEED INDICATOR**  
Up to SIL-2 applications



**SAFETY AUTOMATION SYSTEM**  
Enhanced SIL-2 legacy signaling system



**BEACON READER**  
100% compatible with SILEC beacons



**TRAIN POSITIONING SYSTEM**  
Sensor fusion processing



**SIL4 DEAD MAN VIGILANCE**  
Module-based device



**SAFETY CONTROLLER**  
Generic SIL-2 certified



# REFERENCES AT A GLANCE

IEC/EN Safety Systems & Event Recorders

Customer applications worldwide for all rail segments



**+50**  
COUNTRIES

**+45**  
CUSTOMERS

**+60 K**  
SYSTEMS IN SERVICE

Car builders  
Signaling companies  
Operators

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# SAM 6

*Digital, Audio, and Video Driving Data Analysis Software*

Accurately identify and track dangerous conditions to increase passenger safety and improve train operations. Wabtec's Software for Analysis and Monitoring – SAM – combines conventional data analysis with audio and video from the onboard driving data recorders, providing a more comprehensive view for a complete understanding of the contributing factors when identifying the causes of rail accidents.

## Data visualization

Multiple & synchronized views fully customizable provide best user experience:

- Graphic, tabular and events
- Audio and video
- Journey overview including route map

## Inspection tools

Filters, data search, signal combination, markers, measurements, annotations make analysis faster.

## Sharing results

Annotations, markers attached to journey files and exportation to databases and spreadsheets facilitate collaboration and further processing.

## Customization

- Available in multiple languages
- Personalized view panels
- Data filter design

## Safeguard

Journey file encryption

## Compatibility

All TOM and ATESS train data recorders designed by Wabtec

With SAM, Wabtec's Software for Analysis and Monitoring, users benefit from an efficient solution to analyze audio, video and events recorded by its TOM Driving Data Recorder. It is particularly effective in the following areas:

- Legal investigation
- Driver monitoring
- Train commissioning
- Train maintenance

## CUSTOMER BENEFITS

- Improve understanding of driving events
- Get the tools for efficient analysis
- Share analysis effectively



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