



Mercitalia Intermodal and PJM to realise Europe's smartest rail freight train

Milan and Graz, February 2022: Mercitalia Intermodal (Polo Mercitalia – Gruppo FS Italiane) and PJM put the smartest rail freight train on track. Due to a wide range of functionalities, Mercitalia Intermodal benefits from shorter delivery times as well as condition-based maintenance providing concrete and relevant information. All this together results in savings on maintenance and servicing, more safety and greater efficiency. The gamut of functionalities comprises:

- ▶ Condition-based monitoring in real-time
- ▶ Multi-diagnosis system for load monitoring, brake analysis and brake system monitoring in real-time (correct function of the brakes in terms of pressure in the main pipe, load and cylinder pressure during still-stand and on the ride, brake energy analysis in order for early detection of defective and overloaded brake systems)
- ▶ Train dynamic control to identify critical running situations and defects
- ▶ Determination of running comfort and running safety as well as detection of longitudinal and vertical impacts
- ▶ Real-time trestle monitoring for reliable and safe detection of the correct setting for trailer transports in the intermodal sector
- ▶ Automated brake testing system developed by PJM, SBB Cargo and Rail Cargo Group

The integrated in-train communication is capable of transmitting data to the train driver in case of derailment, incorrect braking conditions, brake overloads, hot box warnings, trestle monitoring and any other safety-related and technical relevant problems. This technology, which is now available, serves to increase safety and avoid critical running situations and defects, as well as to optimize operational processes and to increase efficiency. „With this digital all-round equipment, the intelligent freight train has already reached nearly the full development stage and can be expanded to include coupling functions with the DAC5, if required. The smartest freight train covers all relevant functions, from transport preparation to monitoring during transport“, says Günter Petschnig, CEO of PJM. „Mercitalia is one of the leading railway companies in digital rail freight transport and has been operat-

ing hundreds of wagons equipped with this powerful system for years. Today, this experience is used to further develop and optimize the system. Due to the modular design of the technical solution, existing freight wagons can be upgraded as required. For this ultra-smart pilot train have been implemented all the relevant features required by the international railway industry for a long time". And Mariano Zocco, CTO of Mercitalia Intermodal adds "Technological innovation is fundamental for the future of our business; we need reliable and easily implementable solutions that allow us to improve safety, increase efficiency thanks to predictive maintenance and, thus, to meet market needs."

The majority of the functionalities are performed via the proven, digital overall system WaggonTracker. The dynamic control functions and the automated braking system monitoring functions as well as the trestle monitoring are to be developed and optimized in the course of the Combined Transport project, together with Mercitalia Intermodal and TX Logistik AG. Thanks to the technical concept, the overall-system is fully scalable and can be expanded by any complex monitoring and automation processes, which is currently only provided by the WaggonTracker system.

The basis of the smart freight train is the digital overall system WaggonTracker

WaggonTracker serves as the basic platform for this wide range of functionalities. The digital overall system is powerful and energy-autonomous thanks to the wheel hub generator. WaggonTracker is also scalable for further applications requested by the customer. The system can operate the digital goods train without DAC, but is also compatible with DAC systems. Due to the modality of the system, it is possible to integrate any number of sen-

sors, e.g. for axle bearing temperature monitoring. The in-train communication is based on a long-range radio system (based on LoRa) that is designed for maximum availability and ensures an encrypted, secured connection as well as direct communication to the locomotive driver.

The smart functionalities of the Mercitalia freight train at a glance

- ▶ Train dynamic control
- ▶ Axle bearing temperature monitoring and warning
- ▶ Impact detection and vertical impact monitoring
- ▶ Handbrake position monitoring
- ▶ Monitoring of running comfort and running safety
- ▶ Wheel flat detection
- ▶ General monitoring functions such as mileage, position data, historical data, geofencing
- ▶ Protection against incorrect or improper use (incorrect usage report, etc.)
- ▶ 2-channel long-range radio system for in-train communication based on LoRa technology
- ▶ Environmental temperature
- ▶ Automated brake system monitoring in terms of functionality and proper usage of the brake system
- ▶ Brake energy analysis and calculation of wear for condition-based maintenance
- ▶ Automatic brake test (ABT) with SIL2 certification
- ▶ Integrated trestle monitoring
- ▶ Load weight determination and load distribution

Mercitalia Intermodal at a glance

Mercitalia Intermodal, the Mercitalia Group company - Gruppo FS Italiane - specialised in unaccompanied combined transport, is the major Intermodal Operator in Italy and the third one in Europe. Mercitalia Intermodal promotes, organizes and markets road-rail combined transport, maritime transport and Door to Door transport services in Italy and abroad, managing a railfreight network connecting more than 150 ports and intermodal terminals throughout Europe.

Mercitalia Intermodal manages a wagon fleet of approximately 2.600 modules (of which 1.870 owned modules) used both in domestic and international traffic, which allows it to transport all types of loading units.

With around 75 employees, Mercitalia Intermodal develops around 15.500 trains/year international and domestic, moving around 500.000 load units/year and reaching a turnover of 200 million euro.

PJM at a glance

PJM is an internationally renowned system specialist for rail transport and has successfully implemented projects in 30 countries on 6 continents. As an accredited test centre according to ISO/IEC 17025, PJ Messtechnik GmbH has specialized on tests for the approval of rail vehicles worldwide. PJ Monitoring GmbH is a technology leader in the automation of rail freight transport with forward-looking comprehensive solutions.

PJM was founded in 2006. 60 employees at the Graz site ensure „100 % Made in Austria“: R&D, hardware and software development, production & administration come exclusively from Austria.

Further information:

Mag. Birgit Rami-Jauk

Corporate Communications
rami@pjm.co.at



The WaggonTracker system of PJM serves as the basic platform for the "digital all-round equipment". Europe's most intelligent freight train by Mercitalia Intermodalia also features an automated brake testing system.

Credit: PJM, free of charge



The loading status is also determined (load weight determination and its distribution) and is indicated during the loading process by signal lamps.

Credit: PJM, free of charge



Due to a wide range of functionalities, Mercitalia Intermodal benefits from shorter delivery times as well as condition-based maintenance providing concrete and relevant information.

Credit: PJM, free of charge

Date	Height	Weight	Stability	Conditioning Zone	Temperature	0 - Tare 1 (t)	0 - Tare 2 (t)	0 - Tare 3 (t)	0 - Tare 4 (t)	0 - Tare 5 (t)	Pressure (kPa)	pressure T1 (Bar)	pressure T2 (Bar)	pressure T3 (Bar)	pressure T4 (Bar)	pressure T5 (Bar)
16 Feb 2022 10:00:17:07	9100	4600	2762.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:18:17	9100	4600	2766.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:19:17	9100	4600	2768.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:20:17	9100	4600	2769.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:21:17	9100	4600	2770.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:22:17	9100	4600	2771.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:23:17	9100	4600	2772.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:24:17	9100	4600	2773.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:25:17	9100	4600	2774.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:26:17	9100	4600	2775.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:27:17	9100	4600	2776.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:28:17	9100	4600	2777.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:29:17	9100	4600	2778.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:30:17	9100	4600	2779.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:31:17	9100	4600	2780.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:32:17	9100	4600	2781.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:33:17	9100	4600	2782.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:34:17	9100	4600	2783.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:35:17	9100	4600	2784.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:36:17	9100	4600	2785.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:37:17	9100	4600	2786.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:38:17	9100	4600	2787.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:39:17	9100	4600	2788.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20
16 Feb 2022 10:00:40:17	9100	4600	2789.14	OK	54 °C	0.00	0.00	0.00	0.00	0.00	4.07	0.21	0.20	0.22	0.19	0.20

Relevant information is transmitted in real-time into the web portal.
Credit: PJM, free of charge