



REFERENCES

TRAIN CONTROL AND MONITORING SYSTEM
TCMS



SELETRON

EMU (ELECTRICAL MULTIPLE UNIT)



ALSTOM TRANSPORT B.V.
NETHERLANDS

BLS BERN-LÖTSCHBERG-SIMPLON
SWITZERLAND

PESA
POLAND

SBB
SWITZERLAND

STADLER RAIL
SWITZERLAND, GERMANY, POLAND

TITAGARH FIREMA S.P.A.
ITALY

PROJECT	OPERATOR	NUMBER OF VEHICLES	SELECTION PRODUCT RANGE	APPLICATION / BUS SYSTEM
<ul style="list-style-type: none"> Modernization EMU SGM III 	<ul style="list-style-type: none"> NS Nederlandse Spoorwegen 	<ul style="list-style-type: none"> 2016 - 2017: 25 units 	<ul style="list-style-type: none"> MAS 73x-T 	<ul style="list-style-type: none"> Traction chain control MVB
<ul style="list-style-type: none"> Modernization EMU RBDDe 565 	<ul style="list-style-type: none"> BLS Bern-Lötschberg-Simplon Railway Switzerland 	<ul style="list-style-type: none"> 2009: 21 units 	<ul style="list-style-type: none"> MAS 72x-T MAS 73x-T 	<ul style="list-style-type: none"> Diagnosis, door control, HVAC, wheel slide protection system, wheel slip protection CANopen
<ul style="list-style-type: none"> New vehicles EMU Dart, ELF 	<ul style="list-style-type: none"> Polish State Railway PKP Koleje Śląskie Koleje Mazowieckie SKM Warsaw 	<ul style="list-style-type: none"> Since 2015: > 100 units 	<ul style="list-style-type: none"> MAS 73x-T, 83x-T MAS 73x-T/SIL, 83x-T/SIL 	<ul style="list-style-type: none"> TCMS, diagnosis, door control, HVAC, propulsion control, lighting CANopen, WTB
<ul style="list-style-type: none"> Modernization EMU DPZ+ 	<ul style="list-style-type: none"> SBB Swiss Railways 	<ul style="list-style-type: none"> 2013 - 2018: 115 units 	<ul style="list-style-type: none"> MAS 73x-T, 83x-T 	<ul style="list-style-type: none"> Diagnosis CANopen, Profinet
<ul style="list-style-type: none"> New vehicles EMU KISS double-decker railcar EMU FLIRT (Fast Light Innovative Regional Train) 	<ul style="list-style-type: none"> Diverse operators 	<ul style="list-style-type: none"> Since 2008: > 2000 units 	<ul style="list-style-type: none"> MAS 73x-T, 83x-T MAS 73x-T/SIL, 83x-T/SIL MAS 3xx-T 	<ul style="list-style-type: none"> TCMS, diagnosis, door control, HVAC, propulsion control, lavatory control, wheel slide protection system CANopen, Ethernet, CAN-Powerline
<ul style="list-style-type: none"> New vehicles EMU ETR 243 	<ul style="list-style-type: none"> MCNE Metro Campania NordEst, Italy SEPSA, Italy 	<ul style="list-style-type: none"> 2013 - 2018: > 15 units 	<ul style="list-style-type: none"> MAS 73x-T 	<ul style="list-style-type: none"> TCMS, diagnosis, door control, HVAC, propulsion control MVB

DIESEL MULTIPLE UNIT (DMU)



ALSTOM
GERMANY

BENITO ROGGIO
FERROINDUSTRIAL
ARGENTINA

中国中车
CRRC
NANJING PUZHEN
ROLLING STOCK CO., LTD.
CHINA

NEWAG S.A.
POLAND

PESA
POLAND

STADLER RAIL
SWITZERLAND, USA

PROJECT	OPERATOR	NUMBER OF VEHICLES	SELECTION PRODUCT RANGE	APPLICATION / BUS SYSTEM
<ul style="list-style-type: none"> ■ New vehicles ■ DMU ■ Coradia LINT / iLint 	<ul style="list-style-type: none"> ■ Diverse operators 	<ul style="list-style-type: none"> ■ Since 2003: > 300 units 	<ul style="list-style-type: none"> ■ MAS 72x-T ■ MAS 73x-T ■ MAS 83x-T/SIL 	<ul style="list-style-type: none"> ■ TCMS, diagnosis, propulsion control ■ CANopen, WTB
<ul style="list-style-type: none"> ■ Modernization ■ DEMU (Diesel Electrical Multiple Unit) ■ Toshiba fleet 	<ul style="list-style-type: none"> ■ SOFSE (Operadora Ferroviaria Sociedad del Estado), Argentina 	<ul style="list-style-type: none"> ■ 2014: 16 units 	<ul style="list-style-type: none"> ■ MAS 73x-T/SIL, 83x-T/SIL 	<ul style="list-style-type: none"> ■ Train protection systems, diagnosis ■ CANopen, Ethernet
<ul style="list-style-type: none"> ■ New vehicles ■ DMU 	<ul style="list-style-type: none"> ■ SNCFT Tunis, Tunisia 	<ul style="list-style-type: none"> ■ 2012 - 2015: 20 units 	<ul style="list-style-type: none"> ■ MAS 73x-T, 83x-T 	<ul style="list-style-type: none"> ■ TCMS, diagnosis, door control, HVAC, propulsion control, lighting ■ CANopen, WTB
<ul style="list-style-type: none"> ■ New vehicles ■ 222M 	<ul style="list-style-type: none"> ■ Polish State Railway PKP ■ Koleje Mazowieckie ■ Przewozy Regionalne 	<ul style="list-style-type: none"> ■ Since 2013: 4 units 	<ul style="list-style-type: none"> ■ MAS 73x-T, 83x-T 	<ul style="list-style-type: none"> ■ TCMS, diagnosis, propulsion control ■ CANopen, J1939, CAN-Powerline
<ul style="list-style-type: none"> ■ New vehicles ■ DMU ■ Link 	<ul style="list-style-type: none"> ■ Czech State Railways CD ■ Polish State Railway PKP ■ DB Deutsche Bahn (Germany) 	<ul style="list-style-type: none"> ■ Since 2013: > 50 units 	<ul style="list-style-type: none"> ■ MAS 73x-T, 83x-T ■ MAS 73x-T/SIL, 83x-T/SIL ■ MAS 3xx-T 	<ul style="list-style-type: none"> ■ TCMS, diagnosis, door control, HVAC, propulsion control, lighting ■ CANopen, WTB
<ul style="list-style-type: none"> ■ New vehicles ■ Diesel GTW 	<ul style="list-style-type: none"> ■ New Jersey Transit ■ Capital Metro Austin ■ Denton County Transportation Authority ■ Texrail 	<ul style="list-style-type: none"> ■ Since 2004: > 30 units 	<ul style="list-style-type: none"> ■ MAS 72x-T ■ MAS 73x-T, 83x-T ■ MAS 73x-T/SIL, 83x-T/SIL 	<ul style="list-style-type: none"> ■ TCMS, diagnosis, door control, HVAC, propulsion control, lavatory control, wheel slide protection system ■ CANopen, Ethernet, CAN-Powerline

METRO / MONORAIL



ALSTOM
ROMANIA



BHEL
INDIA



BOMBARDIER

BOMBARDIER
USA, CANADA, BRAZIL



NANJING PUZHEN
ROLLING STOCK CO., LTD.
CHINA



STADLER

STADLER RAIL
SWITZERLAND



METROWAGONMASH MWM
RUSSIA

PROJECT	OPERATOR	NUMBER OF VEHICLES	SELECTION PRODUCT RANGE	APPLICATION / BUS SYSTEM
<ul style="list-style-type: none"> Modernization Metro Bucharest 	<ul style="list-style-type: none"> City of Bucharest, Romania 	<ul style="list-style-type: none"> 2010: 20 units 	<ul style="list-style-type: none"> MAS 72x-T MAS 73x-T 	<ul style="list-style-type: none"> TCMS, diagnosis, propulsion control CANopen, MVB, CAN-Powerline
<ul style="list-style-type: none"> New vehicles Kolkata Metro 	<ul style="list-style-type: none"> KMRC Kolkata Metro Rail Corporation Ltd., India 	<ul style="list-style-type: none"> 2011: 13 units 	<ul style="list-style-type: none"> MAS 73x-T 	<ul style="list-style-type: none"> Propulsion control CANopen
<ul style="list-style-type: none"> New vehicles Monorail São Paulo KAFD King Abdullah, Riyadh 	<ul style="list-style-type: none"> City of Las Vegas Companhia do Metropolitano de São Paulo, Brazil KAFD Riyadh, Saudi Arabia 	<ul style="list-style-type: none"> Since 2005: > 500 units 	<ul style="list-style-type: none"> MAS 72x-T MAS 73x-T, 83x-T 	<ul style="list-style-type: none"> TCMS, diagnosis, door control, propulsion control CANopen
<ul style="list-style-type: none"> New vehicles Suzhou Metro Line 4 	<ul style="list-style-type: none"> Suzhou Metro, China 	<ul style="list-style-type: none"> 2015 - 2016: 40 units 	<ul style="list-style-type: none"> MAS 73x-T, 83x-T 	<ul style="list-style-type: none"> TCMS, diagnosis, door control, HVAC, propulsion control, lighting MVB
<ul style="list-style-type: none"> New vehicles Metro Glasgow Metro Liverpool 	<ul style="list-style-type: none"> Metro Glasgow Merseytravel 	<ul style="list-style-type: none"> Since 2018: > 65 units 	<ul style="list-style-type: none"> MAS 83x-T MAS 3xx-T 	<ul style="list-style-type: none"> TCMS, diagnosis, driver display, door control, HVAC, propulsion control, lighting, remote control CANopen, Ethernet, CAN-Powerline
<ul style="list-style-type: none"> New vehicles Metro Moscow Metro St. Petersburg Metro Budapest 	<ul style="list-style-type: none"> Metro Moscow Metro St. Petersburg Metro Budapest 	<ul style="list-style-type: none"> Since 2016: > 900 units 	<ul style="list-style-type: none"> MAS 73x-T, 83x-T 	<ul style="list-style-type: none"> TCMS, wheel slide protection system, Train Backbone CAN, Ethernet

TRAM



ALSTOM
USA

DURMAZLAR
TURKEY

CRRC (CNR ERD)
CHINA

PESA
POLAND

STADLER RAIL VALENCIA
SPAIN

TRANSTECH
FINLAND

PROJECT	OPERATOR	NUMBER OF VEHICLES	SELECTION PRODUCT RANGE	APPLICATION / BUS SYSTEM
<ul style="list-style-type: none"> Modernization LRV Maryland Transit Administration MTA 	<ul style="list-style-type: none"> Maryland Transit Administration MTA 	<ul style="list-style-type: none"> 2015: 53 units 	<ul style="list-style-type: none"> MAS 73x-T, 83x-T 	<ul style="list-style-type: none"> TCMS, diagnosis, door control, HVAC, propulsion control, lighting CANopen
<ul style="list-style-type: none"> New vehicles DURMARAY / City of Bursa KMM Kocaeli Metropolitan Municipality SMM Samsun Metropolitan Municipality 	<ul style="list-style-type: none"> DURMARAY / City of Bursa KMM Kocaeli Metropolitan Municipality SMM Samsun Metropolitan Municipality 	<ul style="list-style-type: none"> Since 2012: > 36 units 	<ul style="list-style-type: none"> MAS 73x-T, 83x-T 	<ul style="list-style-type: none"> TCMS, diagnosis, door control, HVAC, propulsion control, lighting CANopen
<ul style="list-style-type: none"> New vehicles Chengdu LRV Shenyang LRV 	<ul style="list-style-type: none"> Xinjin LRV, Xinzhu / CRC Shenyang LRV 	<ul style="list-style-type: none"> Since 2016: > 50 units 	<ul style="list-style-type: none"> MAS 73x-T, 83x-T 	<ul style="list-style-type: none"> TCMS, diagnosis, door control, HVAC, propulsion control, lighting CANopen
<ul style="list-style-type: none"> New vehicles Tram Swing, Jazz, Fokstrot, Twist 	<ul style="list-style-type: none"> Cities in Poland: Warsaw, Gdansk, Szczecin, Toruń, Czestochowa, Krakow City of Moscow, Russia 	<ul style="list-style-type: none"> Since 2011: > 300 units 	<ul style="list-style-type: none"> MAS 73x-T, 83x-T MAS 3xx-T 	<ul style="list-style-type: none"> TCMS, door control, HVAC, propulsion control, lighting CANopen
<ul style="list-style-type: none"> New vehicles LRV Santos, BR LRV Sheffield, UK 	<ul style="list-style-type: none"> EMTU Empresa Municipal do Transporte Urbano, Brazil Stagecoach Supertram / Network Rail 	<ul style="list-style-type: none"> 2013 - 2016: 22 units 2013 - 2016: 7 units 	<ul style="list-style-type: none"> MAS 73x-T, 83x-T HMI 83xx 	<ul style="list-style-type: none"> TCMS, diagnosis, driver display, door control, HVAC, propulsion control, lighting CANopen, Ethernet, CAN-Powerline
<ul style="list-style-type: none"> New vehicles Helsinki LRV 	<ul style="list-style-type: none"> City of Helsinki, Finland 	<ul style="list-style-type: none"> 2014: 41 units 	<ul style="list-style-type: none"> MAS 73x-T, 83x-T 	<ul style="list-style-type: none"> TCMS, diagnosis, door control, HVAC, propulsion control, lighting CANopen

LOCOMOTIVES



QISHUYAN LOCOMOTIVE CO. LTD.
CHINA



GMEINDER LOKOMOTIVENFABRIK
GERMANY



RHÄTISCHE BAHN
SWITZERLAND



STADLER RAIL
SWITZERLAND



STADLER RAIL VALENCIA
SPAIN



VOSSLOH LOCOMOTIVES
GERMANY

PROJECT	OPERATOR	NUMBER OF VEHICLES	SELECTION PRODUCT RANGE	APPLICATION / BUS SYSTEM
<ul style="list-style-type: none"> ■ New vehicles ■ Diesel locomotives 	<ul style="list-style-type: none"> ■ PN Pacific National, Australia 	<ul style="list-style-type: none"> ■ 2011 - 2012: 5 units 	<ul style="list-style-type: none"> ■ MAS 73x-T, 83x-T ■ HMI 83xx 	<ul style="list-style-type: none"> ■ TCMS, diagnosis, driver display, propulsion control, lighting ■ CANopen, Ethernet, serial communication
<ul style="list-style-type: none"> ■ New vehicles ■ Modernization ■ D180, BR214 	<ul style="list-style-type: none"> ■ ÖBB Österreichische Bundesbahnen (Austria) ■ DB Deutsche Bahn (Germany) ■ Voest-Alpine AG, Austria 	<ul style="list-style-type: none"> ■ Since 2003: > 40 units 	<ul style="list-style-type: none"> ■ MAS 73x-T, 83x-T ■ MAS 73x-T/SIL, 83x-T/SIL 	<ul style="list-style-type: none"> ■ TCMS ■ CANopen, J1939, CAN-Powerline
<ul style="list-style-type: none"> ■ Modernization ■ Gem 4/4 801- 802 	<ul style="list-style-type: none"> ■ RhB Rhätische Bahn, Switzerland 	<ul style="list-style-type: none"> ■ 2003: 3 units 	<ul style="list-style-type: none"> ■ MAS 72x-T 	<ul style="list-style-type: none"> ■ Diagnosis, driver display, propulsion control ■ CANopen, CAN-Powerline
<ul style="list-style-type: none"> ■ New vehicles ■ Rack Locomotive ■ He 4/4 	<ul style="list-style-type: none"> ■ MRS Logística S.A., Brazil 	<ul style="list-style-type: none"> ■ 2011 - 2012: 7 units 	<ul style="list-style-type: none"> ■ MAS 73x-T, 83x-T 	<ul style="list-style-type: none"> ■ TCMS, diagnosis, propulsion control, wheel slide protection system, wheel slip protection ■ CANopen, CAN-Powerline
<ul style="list-style-type: none"> ■ New vehicles ■ EUROLight & EURODual diesel-electric locomotives 	<ul style="list-style-type: none"> ■ DRS, Direct Rail Service, UK ■ Dinazzano Po, Italy ■ HVLE, Germany 	<ul style="list-style-type: none"> ■ Since 2011: > 32 units ■ 2017: 1 unit ■ 2018: 10 units 	<ul style="list-style-type: none"> ■ MAS 73x-T, 83x-T ■ HMI 345x ■ HMI 83xx 	<ul style="list-style-type: none"> ■ TCMS, diagnosis, driver display, HVAC, propulsion control ■ CANopen, J1939, Ethernet, WTB
<ul style="list-style-type: none"> ■ New vehicles ■ G1700, AM843, G6, DE12 / DE18 locomotives 	<ul style="list-style-type: none"> ■ VPS Verkehrsbetriebe Peine-Salzgitter, Germany ■ SBB CFF FFS, Switzerland 	<ul style="list-style-type: none"> ■ Since 2013: > 80 units 	<ul style="list-style-type: none"> ■ MAS 72x-T ■ MAS 73x-T, 83x-T ■ MAS 73x-T/SIL, 83x-T/SIL 	<ul style="list-style-type: none"> ■ TCMS, diagnosis, propulsion control, wheel slide protection system, wheel slip protection, remote maintenance ■ CANopen, J1929, Ethernet, CAN-Powerline, serial communication

SPECIAL VEHICLES



MEDEL / TÜVASAS
TURKEY



MERMEC
ITALY



PLASSER & THEURER
AUSTRIA



REMAR PASCANI
ROMANIA



ROBEL
GERMANY



TECSOL TECHNICAL SOLUTIONS
AUSTRIA

	MEDEL / TÜVASAS TURKEY	MERMEC ITALY	PLASSER & THEURER AUSTRIA	REMAR PASCANI ROMANIA	ROBEL GERMANY	TECSOL TECHNICAL SOLUTIONS AUSTRIA
PROJECT	<ul style="list-style-type: none"> ■ New vehicles ■ Sleeping coaches, passenger & restaurant coaches 	<ul style="list-style-type: none"> ■ New vehicles ■ Track inspection vehicles 	<ul style="list-style-type: none"> ■ New vehicles ■ Track laying and catenary wire installation as well as maintenance 	<ul style="list-style-type: none"> ■ New vehicles ■ Double-decker railcar 	<ul style="list-style-type: none"> ■ New vehicles ■ Machines for track maintenance and service, IFO, MI, GWK 	<ul style="list-style-type: none"> ■ Modernization ■ Bcm 61 (support car) for Rola "Rolling Highway"
OPERATOR	<ul style="list-style-type: none"> ■ BDZ Bulgarian State Railway, Bulgaria ■ IRR Iraqi Railways, Iraq 	<ul style="list-style-type: none"> ■ Transport for NSW (New South Wales), Australia ■ EFE - Empresa de los Ferrocarriles del Estado, Chile ■ BART, USA 	<ul style="list-style-type: none"> ■ Worldwide projects 	<ul style="list-style-type: none"> ■ C.F.R. Romania, (Romanian State Railways) 	<ul style="list-style-type: none"> ■ Jernbaneverket, Norway ■ ÖBB Österreichische Staatsbahn, Austria ■ BLS Bern-Lötschberg-Simplon, CH ■ DB Deutsche Bahn, Germany ■ CFL Chemins de Fer Luxembourgeois, Luxembourg 	<ul style="list-style-type: none"> ■ RAlpin AG, Switzerland
NUMBER OF VEHICLES	<ul style="list-style-type: none"> ■ 2011 - 2015: 30 units ■ 2014 - 2015: 14 units 	<ul style="list-style-type: none"> ■ 2013 - 2018: > 5 units 		<ul style="list-style-type: none"> ■ 2007: 10 units 	<ul style="list-style-type: none"> ■ Since 2003: > 80 units 	<ul style="list-style-type: none"> ■ 2011: 20 units
SELECTION PRODUCT RANGE	<ul style="list-style-type: none"> ■ MAS 72x-T ■ MAS 73x-T 	<ul style="list-style-type: none"> ■ MAS 73x-T, 83x-T ■ HMI 83xx 	<ul style="list-style-type: none"> ■ EL-AM (SIL & non-SIL) 	<ul style="list-style-type: none"> ■ MAS 72x-T 	<ul style="list-style-type: none"> ■ MAS 73x-T, 83x-T ■ MAS 73x-T/SIL, 83x-T/SIL ■ MAS 3xx-T ■ MAS 3xx-T/SIL 	<ul style="list-style-type: none"> ■ MAS 72x-T ■ MAS 73x-T, 83x-T
APPLICATION / BUS SYSTEM	<ul style="list-style-type: none"> ■ TCMS, diagnosis, door control, HVAC, lavatory control, lighting ■ CANopen, WTB 	<ul style="list-style-type: none"> ■ TCMS, diagnosis, driver display, propulsion control ■ CANopen, J1939, Ethernet, serial communication 	<ul style="list-style-type: none"> ■ TCMS, diagnosis, lighting, propulsion control, remote maintenance ■ CANopen, J1939, Ethernet, CAN-Powerline, serial communication 	<ul style="list-style-type: none"> ■ TCMS, diagnosis, door control, HVAC, lighting ■ CANopen, CAN-Powerline 	<ul style="list-style-type: none"> ■ TCMS, diagnosis, propulsion control ■ CANopen, J1939, MVB, Ethernet, CAN-Powerline, serial communication 	<ul style="list-style-type: none"> ■ TCMS, HVAC ■ CANopen, Ethernet, serial communication

OEM / SUBSYSTEMS



FOGTEC / DOWNER EDI RAIL
GERMANY / AUSTRALIA



MEDCOM
POLAND



MUSFELD AIRCOTECH AG
SWITZERLAND



NPP-EPRO
RUSSIA



SBB
SWITZERLAND



SYSTEMTECH SCHNEIDER
SWITZERLAND

PROJECT	OPERATOR	NUMBER OF VEHICLES	SELECTION PRODUCT RANGE	APPLICATION / BUS SYSTEM
<ul style="list-style-type: none"> Subsystem FDS Fire Detection System 	<ul style="list-style-type: none"> Waratah Train, Australia 	<ul style="list-style-type: none"> Since 2015: 75 units 	<ul style="list-style-type: none"> MAS 72x-T MAS 83x-T 	<ul style="list-style-type: none"> Diagnosis, driver display CANopen, Ethernet, serial communication
<ul style="list-style-type: none"> Subsystem Traction converter 	<ul style="list-style-type: none"> PKP Polskie Koleje Państwowe, Polish State Railway 	<ul style="list-style-type: none"> Since 2008: > 200 units 	<ul style="list-style-type: none"> MAS 72x-T MAS 73x-T, 83x-T 	<ul style="list-style-type: none"> Diagnosis, propulsion control CANopen
<ul style="list-style-type: none"> Subsystem HVAC system 	<ul style="list-style-type: none"> Stadler Rail, worldwide Bombardier, worldwide 	<ul style="list-style-type: none"> Since 2004: > 300 units 	<ul style="list-style-type: none"> MAS 72x-T MAS 73x-T 	<ul style="list-style-type: none"> HVAC CANopen
<ul style="list-style-type: none"> Subsystem Electronic equipment 	<ul style="list-style-type: none"> UST-Katav Carriage Works, Russia 	<ul style="list-style-type: none"> Since 2014: > 35 units 	<ul style="list-style-type: none"> MAS 83x-T 	<ul style="list-style-type: none"> Diagnosis CANopen
<ul style="list-style-type: none"> Subsystem Lavatory system 	<ul style="list-style-type: none"> SBB Swiss Railways 	<ul style="list-style-type: none"> Since 1997: 341 units (PMC) Since 2018: 341 units (73x) 	<ul style="list-style-type: none"> PMC MAS 73x-T 	<ul style="list-style-type: none"> Lavatory control MVB
<ul style="list-style-type: none"> Subsystem Lavatory system 	<ul style="list-style-type: none"> Stadler Rail, Switzerland 	<ul style="list-style-type: none"> Since 2008: > 1200 units 	<ul style="list-style-type: none"> MAS 72x-T MAS 73x-T 	<ul style="list-style-type: none"> Lavatory control CANopen

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 **KNORR-BREMSE**

 **NEW YORK AIR BRAKE**

 **IFE**

 **MERAK**

 **MICROELETTRICA**

 **SELECTRON**

 **KIEPE ELECTRIC**

 **EVAC**

 **ZELISKO**

 **RAILSERVICES**
