



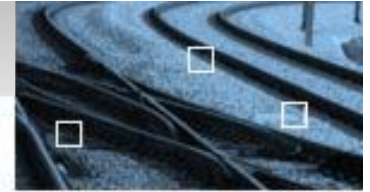
TrainScout

Improving Locomotive Performance and Management

Friday, July 04,
2008



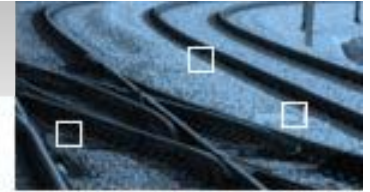
TrainScout - Presentation



- **TrainScout is a powerful locomotive monitoring and control solution, developed over a hardware and software scalable platform. TS is compliant with NBR 8365, IEC 60571 and IEC 61373 railroad standards and also with IEC-61131-3, that establishes the principles for open systems. The TrainScout has a modular and evolutionary conception that allows continuous incorporation of new features, adding new benefits while preserving prior investments.**



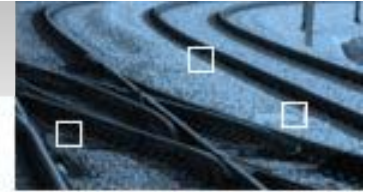
TrainScout Benefits



- 1. Monitoring of train operation and locomotive behavior**
- 2. Introduction of predictive maintenance techniques**
- 3. Gathering and replication of the “Golden Run”**
- 4. Locomotive operation facilitation**
- 5. Data recording for real time and/or historical analysis, leading to effective KPI generation and management (including stoppage and general performance indicators)**
- 6. Detailed information of the slave locomotives available on the leader locomotive**



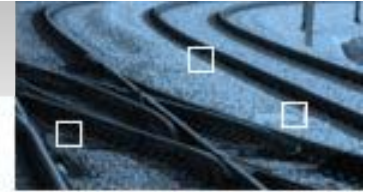
TrainScout Benefits



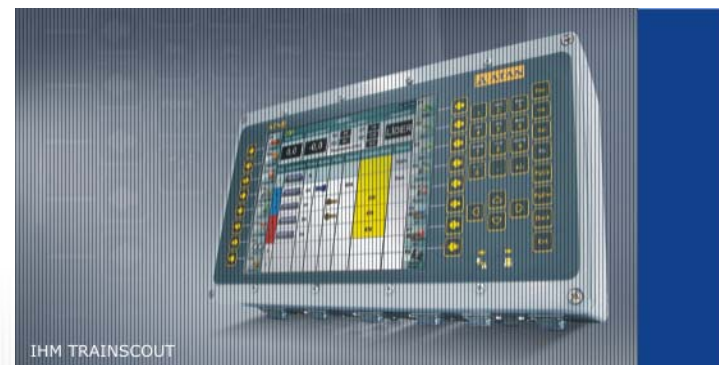
- 7. Avoidance of train stoppages caused by electric jumper cable failures**
- 8. Empowerment of engine operators, maintenance teams and command center, leading to better and faster decisions**
- 9. Easy integration of new features, preserving prior investments on the TrainScout platform**
- 10. Fuel saving through usage of independent throttle control - ITC**
- 11. Improvement of the locomotive operational performance**



TrainScout Suite



- **The TrainScout Suite is composed of the following modules:**
 - TS Logger – Advanced Event Recorder
 - TS Jumper – Electronic Jumper
 - μ TS – Microprocessor
 - EPS Rail – Railway operation management software





Typical Integrated Architecture

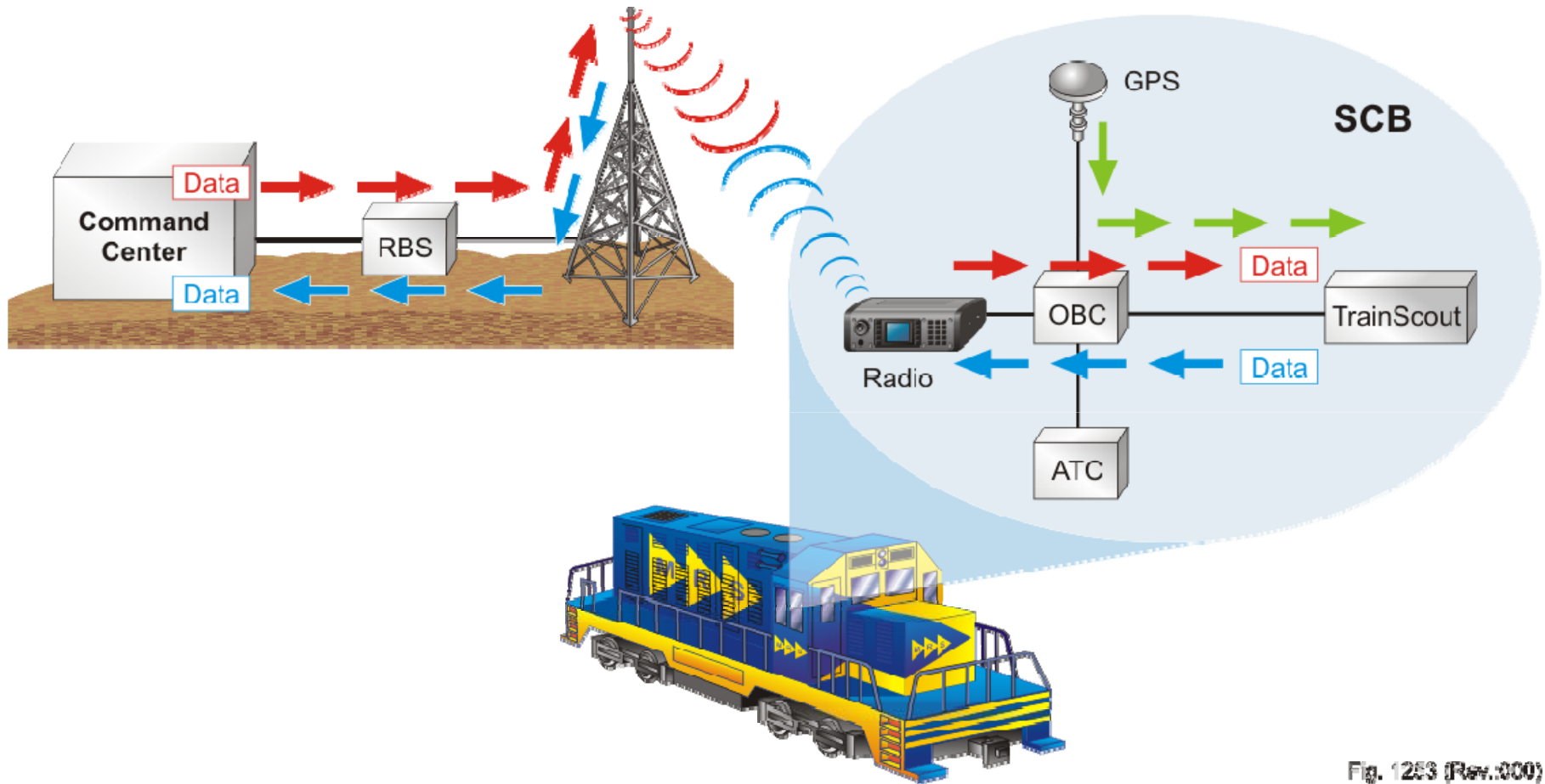
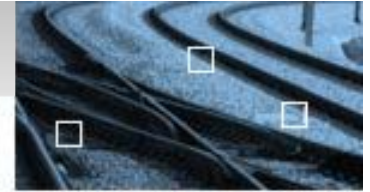


Fig. 1253 (Rev.000)



TS-Logger and TS Jumper Application

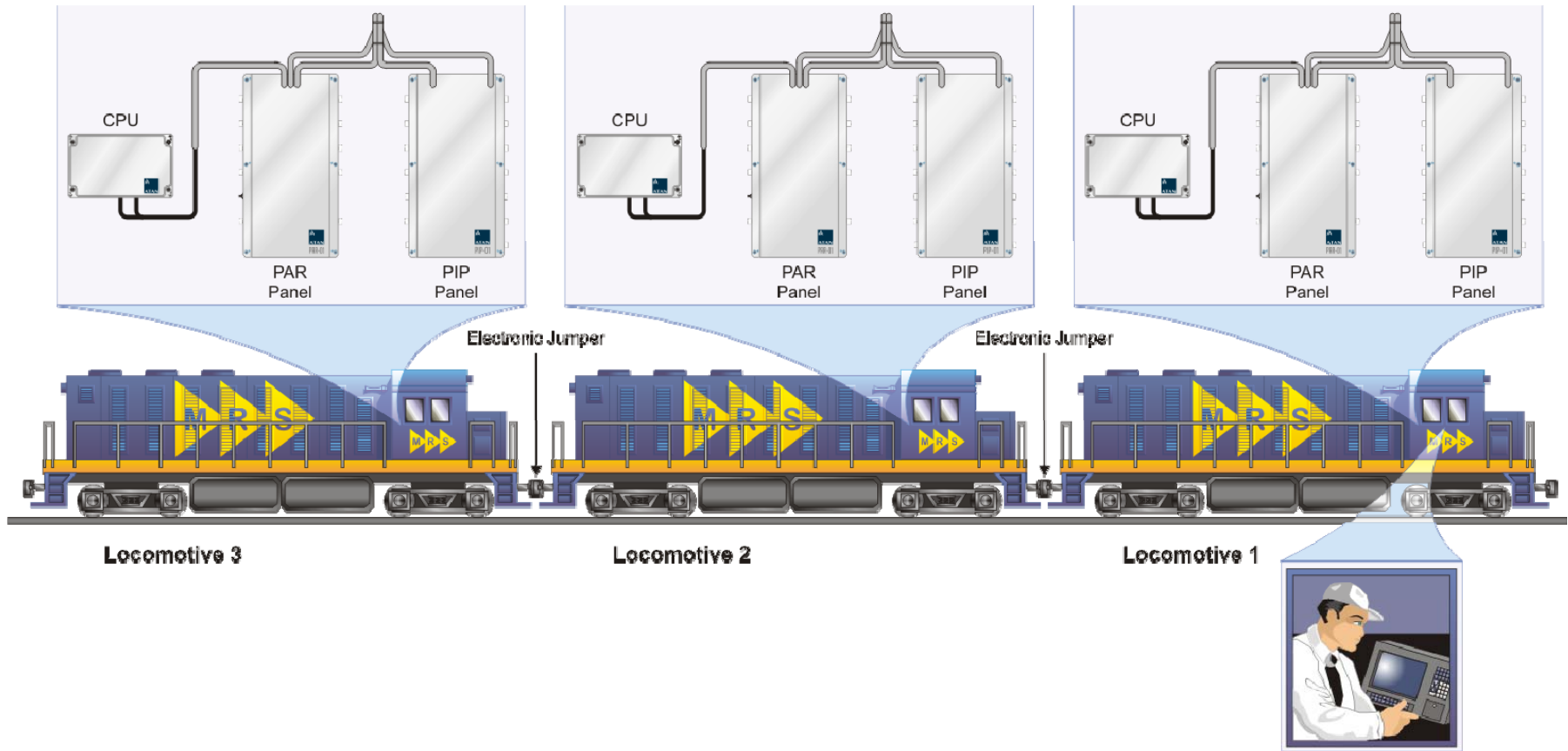
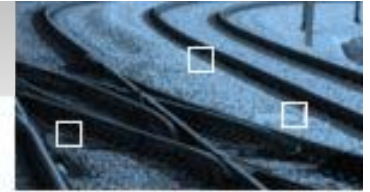


Fig : 1948 (Rev.000)



TS Logger & TS Jumper Application

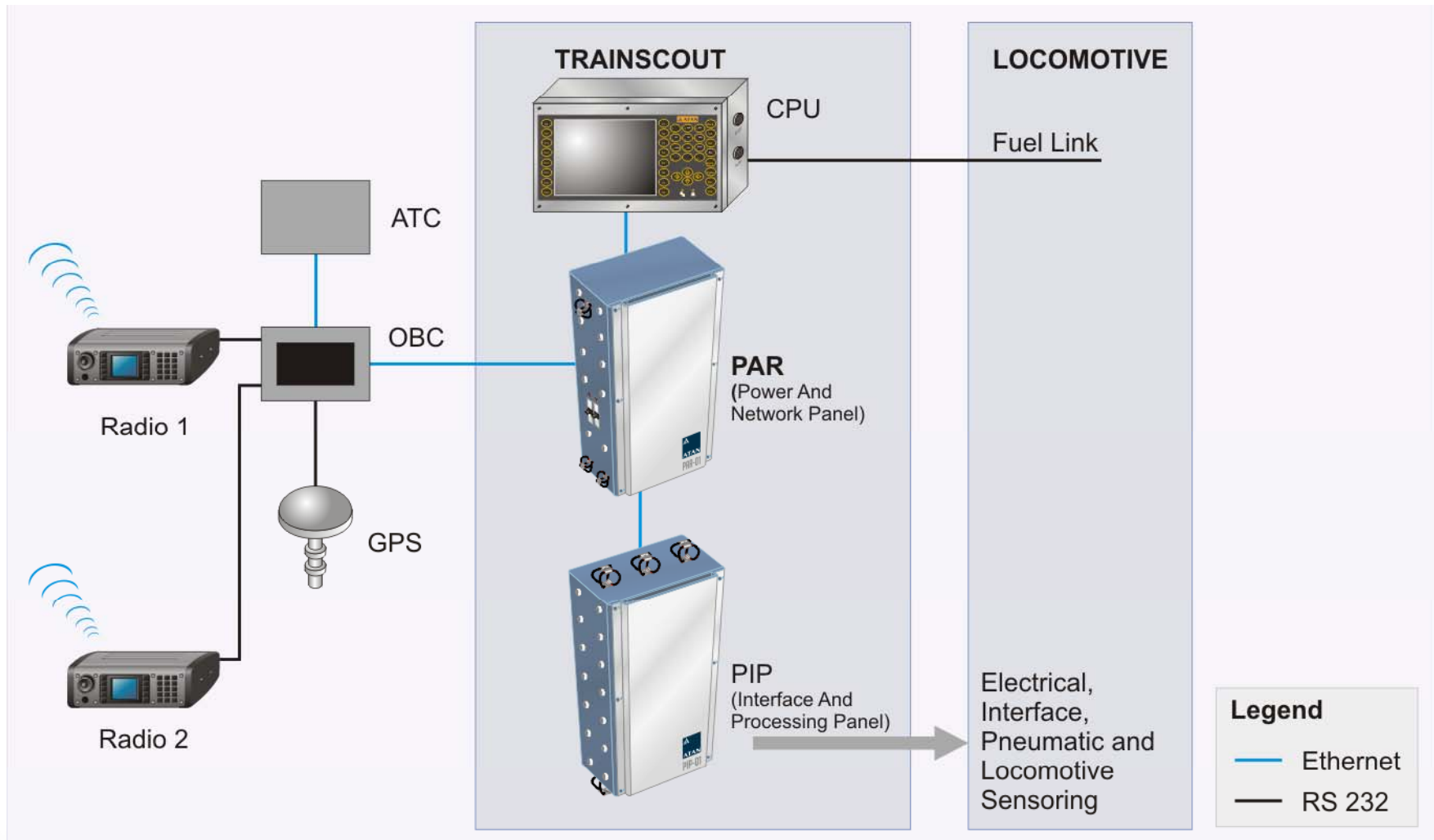
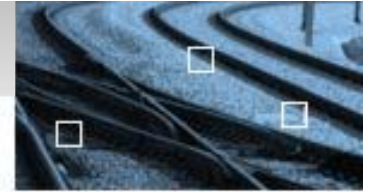


Fig. 1212 (Rev.:000)

TrainScout Functionalities



TrainScout main functionalities:

- I. Advanced Event Recorder (TS Logger)
- II. Electronic Jumper (TS Jumper)
- III. Alarms Generation
- IV. Automatic Software Update
- V. GPS Date & Time Synchronization
- VI. Telemetry
- VII. Auto Diagnosis
- VIII. Independent Throttle Control
- IX. Man Machine Interface – MMI (Display and Keyboard)

TS Logger Functionalities



Advanced Event Recorder

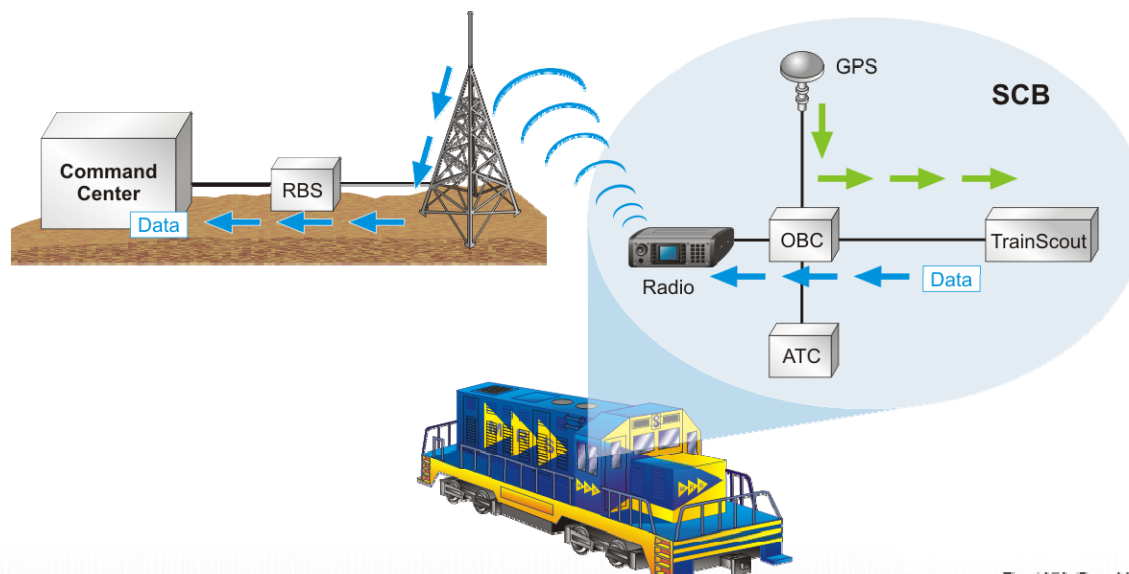
Locomotive's events recorded in internal memory with option of crushproof module

Each 10 minutes the files are zipped and sent to the Command and Operation Center, where they will be processed by the EPS Rail

Analog variables are recorded each 5 seconds and the digital are recorded on a event driven basis.

Typical Data Storage Capacity: 30 days

All events have a time stamp

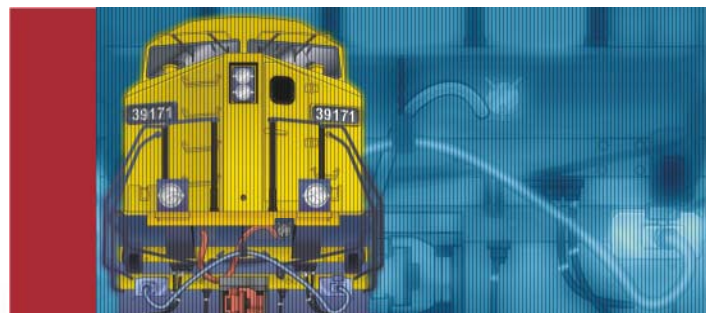


TS Jumper Functionalities



Electronic Jumper: Interconnects electronically, by cable or radio, all the locomotives of the train. Therefore, at the leader locomotive is possible to monitor all variables from the slave locomotives, allowing complete monitoring and commands issuing (e.g. alarm reset, diesel engine control, etc.)

The TS Jumper replaces the standard electric jumper cable with much more functionalities and flexibility.



TS Jumper Functionalities



Electronic Jumper

Allows the use of Independent Throttle Control - ITC

Allows the locomotive operator to issue commands the slave locomotives (Horn, Head Lamps, diesel engine startup and shutdown, throttle control and alarms acknowledgement)

Battery charge equalization for the interconnected locomotives

Other available functionalities (Through TS MMI or OBC MMI):

- Slave locomotives alarms reading
- Train driving Data
- Maintenance Data
- Simultaneous data of all locomotives
- Independent throttle Control - ITC
- Burden Test command and recording

TrainScout Functionalities



Driving Data

Break pipe pressure

Equalizing reservoir pressure

Break cylinder pressure

Main reservoir pressure

Traction motor(s) current

Traction/Dynamic Breaking

TrainScout Functionalities



Maintenance Data

- Speed
- Traction Motor(s) current
- Break pipe pressure
- Main reservoir pressure
- Equalizing reservoir pressure
- Break cylinder pressure
- Power
- Excitation current
- Main generator current
- Main generator voltage
- Auxiliary generator voltage
- Burden rheostat position
- Fuel (volume in tank)
- Diesel oil pressure
- Lubricant oil pressure

TrainScout Functionalities



Simultaneous Locomotives Data:

Leader locomotive

Slave locomotives

Locomotive position on the train

Locomotive position related to the leader locomotive

Locomotive serial number

Traction motor(s) current

Throttle lever position

Open/closed doors

Alarms

Traction mode/Dynamic brake

Diesel motor operation status

TrainScout Functionalities



Alarms Generation

The TrainScout generates alarms and sends them to the engine operator through the MMI. These alarms can be sent to the command and operation center.

The alarms notify the engine operator of the problems and failures of the locomotives.

Each alarm has its own codification and can be seen on the MMI of TrainScout or on the OBC.

Código do Alarme	Descrição do Alarme
BAT	Bateria descarregada.
FLT	Filtro de ar sujo.
TER	Relé terra atuado.
BPA	Baixa pressão de água.
BPO	Baixa pressão de óleo.

Num	Loco	Pt	Bz	PA	Alarme	Amp	Status
1	8879	8				123	
2	7584	3			PAT	123	
3	1234	5			PAT	123	
4	8745	2				1002	
5	9789	N					2:58
6	6541	5				1250	
7	2244	N				0	DESL

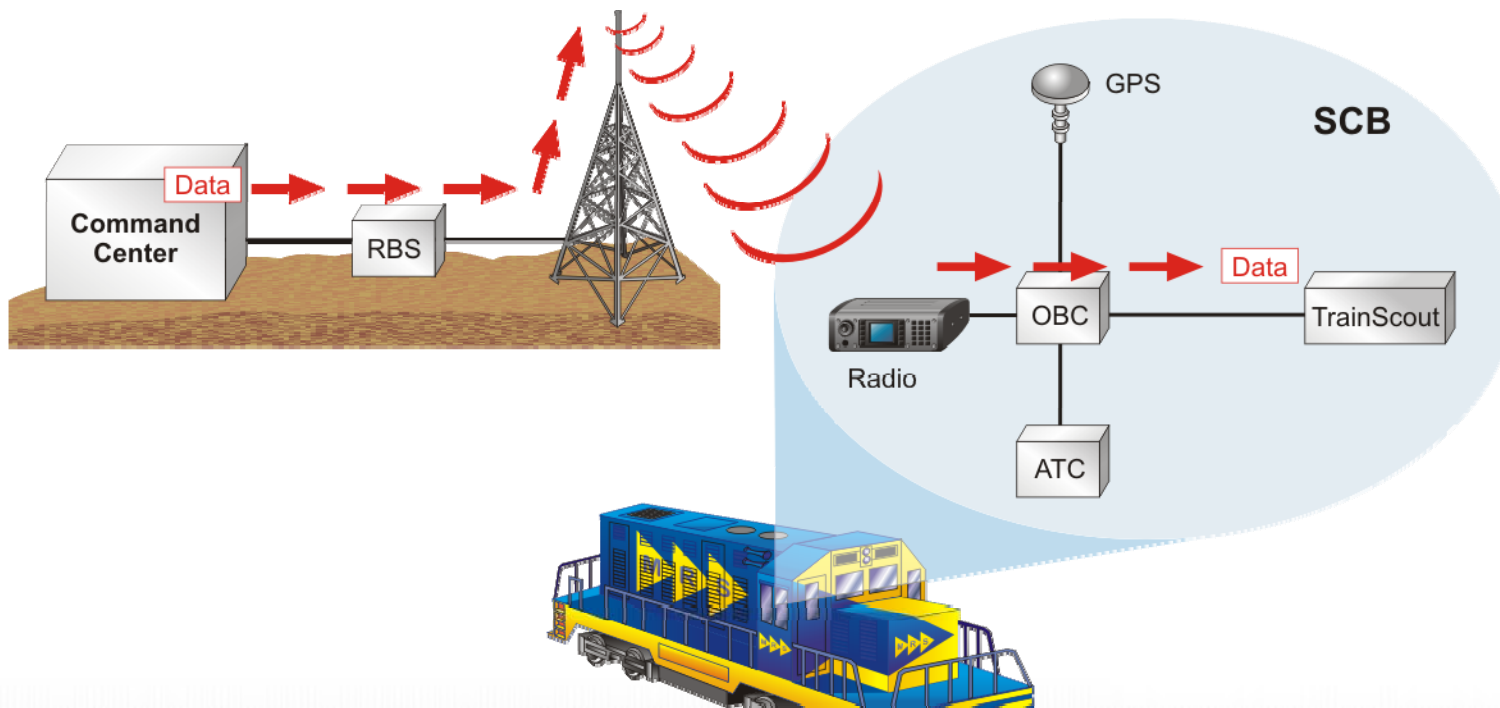
TrainScout Functionalities



Automatic Software Update

The command center sends, via radio, new software updates as soon as they become available

The software update does not change the operational parameters already configured



TrainScout Functionalities



Date and Time Synchronization

The TrainScout synchronizes its time base with a GPS

The TrainScout operates with GMT time (Greenwich Meridian Time). Time zones and daylight saving time is treated by the EPS – Railway Operation Management Software.

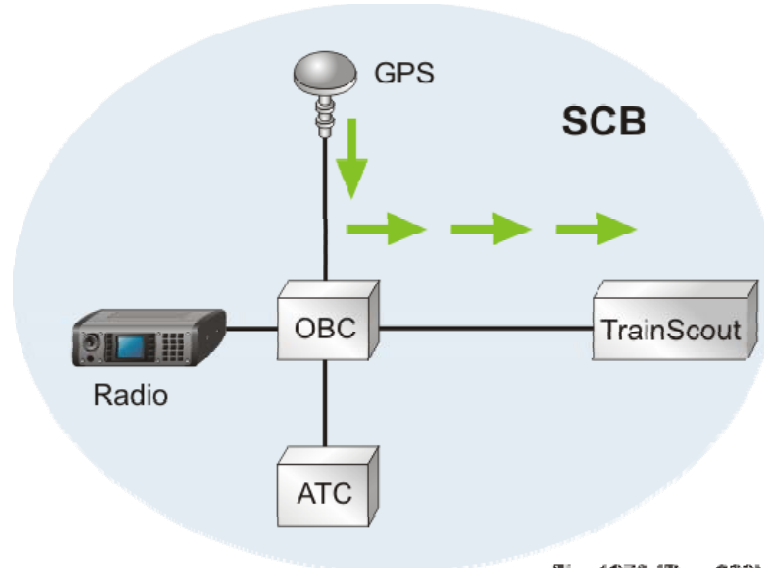


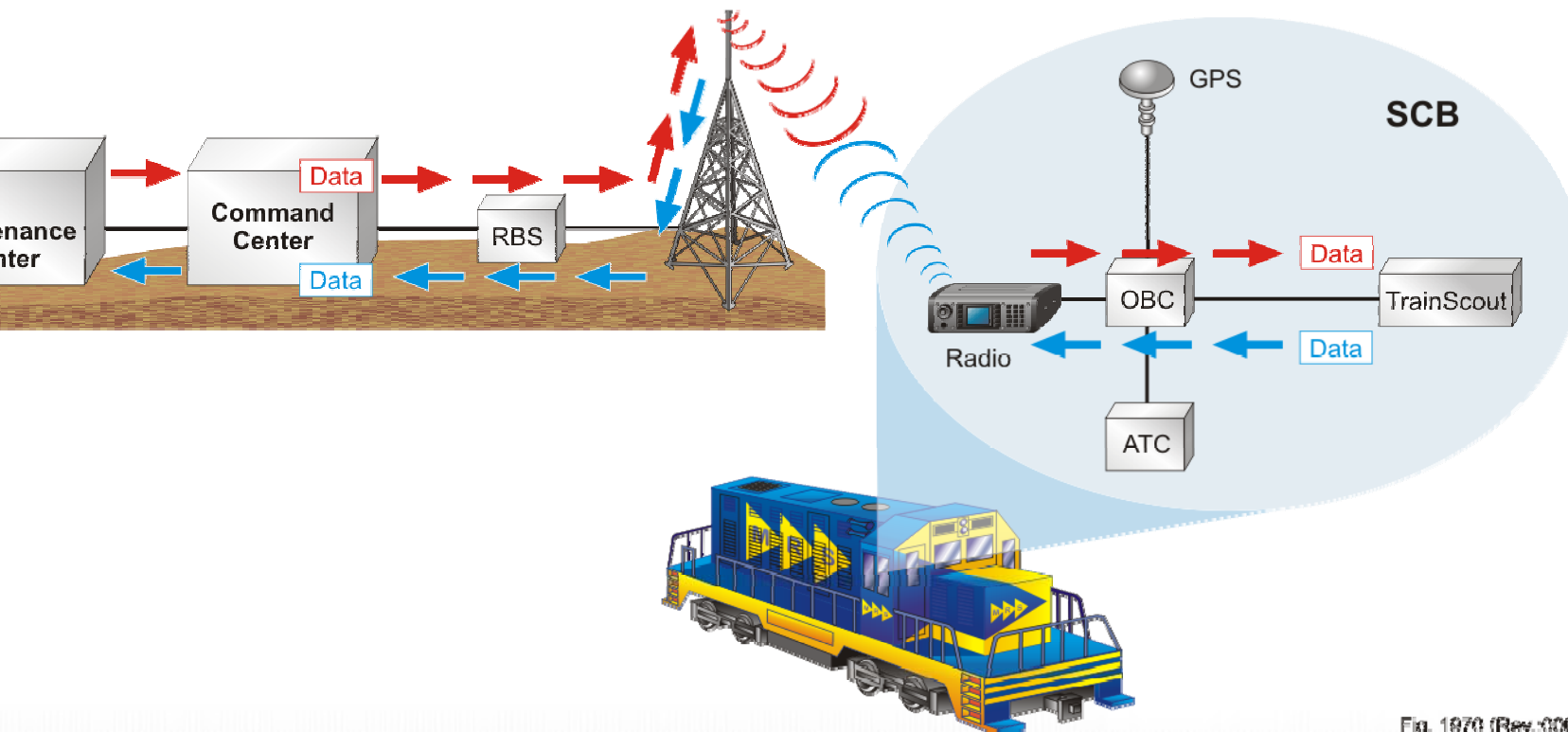
Fig. 1073 (Rev.:000)

TrainScout Functionalities



Telemetry

The telemetry allows the Maintenance Center to acquire real time data from the locomotives.



TrainScout Functionalities



o Diagnosis

The auto diagnosis function makes the modules and I/O channels comprehensive monitoring. In case any anomaly is detected, all the outputs are disengaged and an alarm is generated

The auto diagnosis also monitors the correspondence between commands and their execution. Case an output is find in different state that it should be, the system immediately turn all the outputs off and cuts the energy to the command panel and an alarm is generated

TrainScout Functionalities



Independent Throttle Control – ITC

ITC is composed of:

Throttle Control

Controls the slave locomotives throttle setting. When the ITC is off, the slave locomotives follows the throttle of the leader.

When the ITC is on, any locomotive can receive a different setting for its throttle.

Horn and Diesel Engine Control

Idle mode command

Engine startup

Engine shutdown

Fuel pump reset

Horn: selects the horn of any locomotive as the active train horn

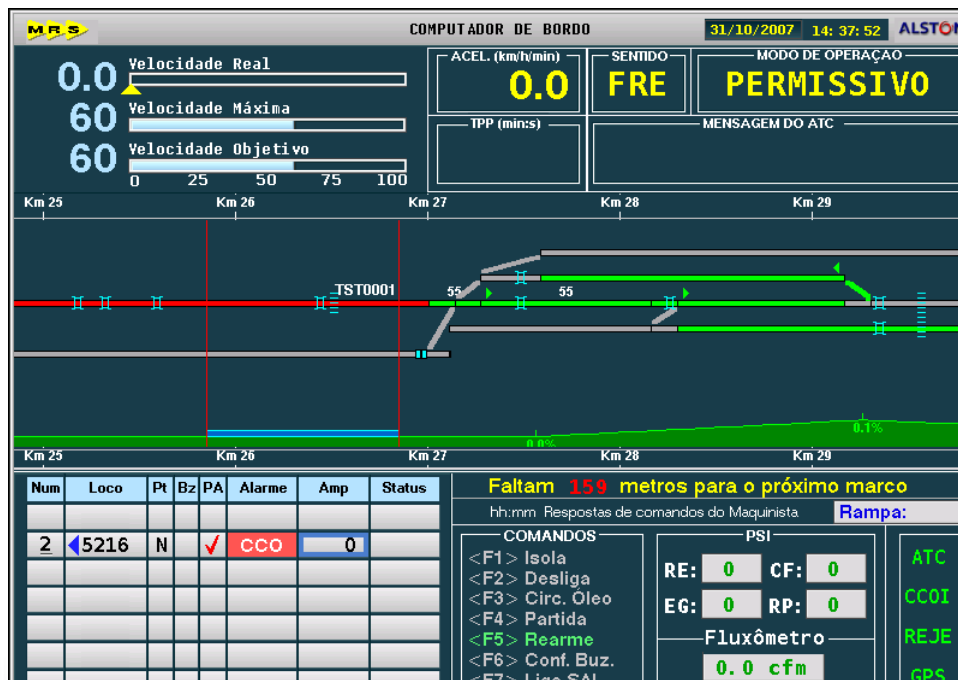
Funcionalidades do REJE



Interface Humana-Máquina – IHM

A IHM do aplicativo do REJE é parte integrante da IHM do OBC a ser fornecido pela Alstom.

Para o fornecimento RE estarão disponíveis na IHM apenas as informações da tela de [Informação do Sistema](#).



Main Variables and Commands



DESCRIPTION

Locomotive Throttle

Locomotive Positioning on the Train

Main Generator Excitation Current

Main Generator Current

Main Generator Current in Dynamic

Traction Motor Current

Dynamic Excitation

Hump Excitation

Leader Locomotive

Throttle Lever Position

Main Variables and Commands



DESCRIPTION

Main Generator Power

Break Cylinder Air Pressure

Break Pipe Air Pressure

Equalizing Reservoir Air Pressure

Main Reservoir Air Pressure

Fuel in The Tank

Auxiliary Generator Voltage

Main Generator Voltage

Locomotive speed

Main Variables and Commands



DESCRIPTION

Dynamic Break Activation

Sander Activated

Automatic Burden Test Activated

Low Water Pressure

Low Oil Pressure

Battery Discharged

Fuel Pump On

Horn Activated by TrainScout

Bell Activated

Throttle Circuit

Main Variables and Commands



DESCRIPTION

Command "Diesel Engine Shutdown" activated

Command "Diesel Engine Startup" activated

Command "Diesel engine in Idle" activated

Command "Fuel Pump Reset" activated

Command "Alarms Reset" activated

Command ITC On

Compressor On

Battery Equalizing Contactor On

Head Light On

Dusty Air Filter

Dead Man Switch On

Locomotive MMI Off

Main Variables and Commands



DESCRIPTION

Reverse Lever Forward

Reverse Lever Backward

Slip Second Stage

PCS Open

Door Open

Hump Control Preset

Dynamic Break Preset

Traction Preset

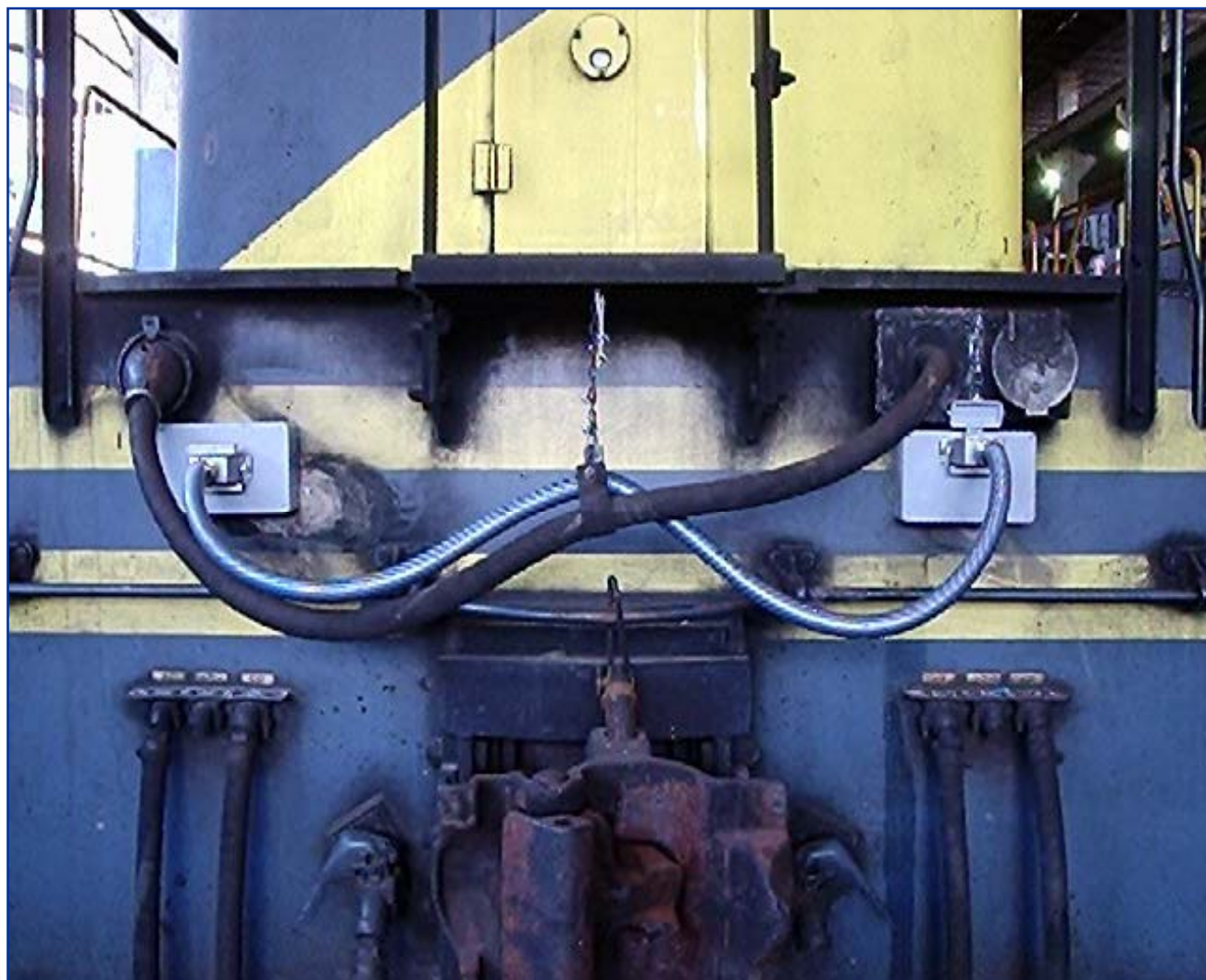
Ground Relay Activated

Engine Internal (Oil Sump) Overpressure

Slip Overtime

Push Forward

Electronic Jumper Connectors



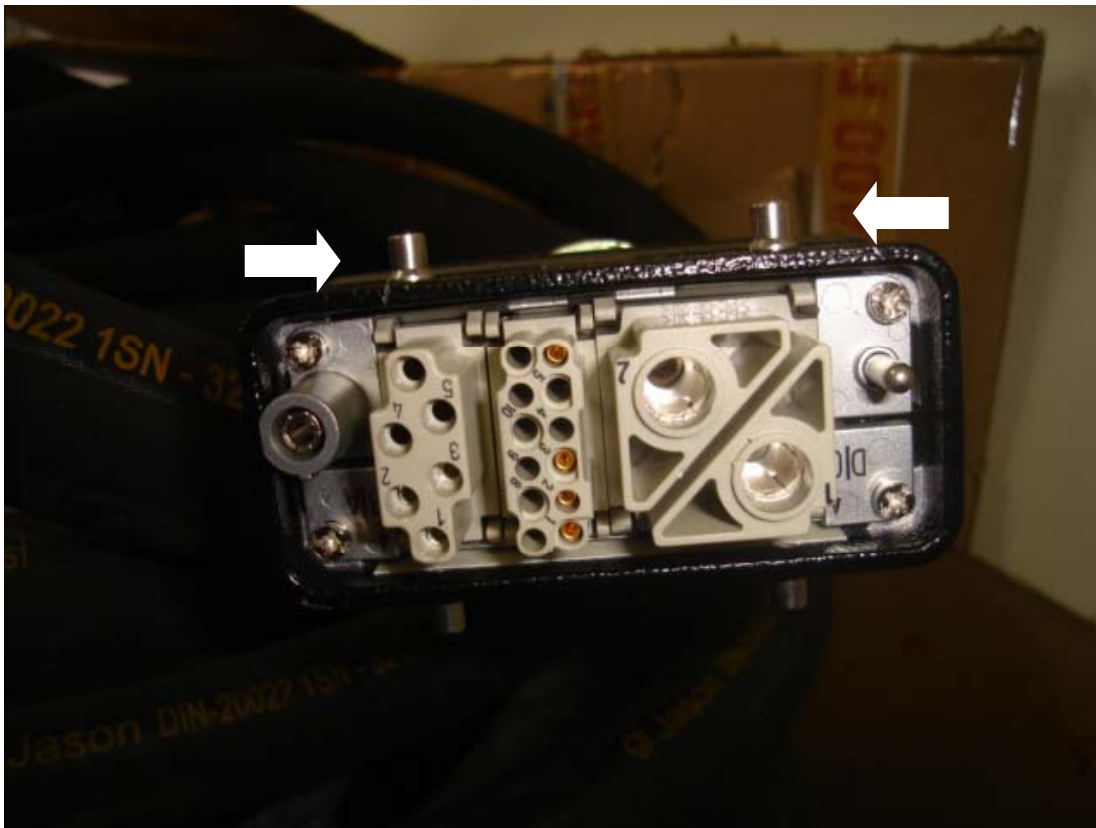
Electronic Jumper Connectors



Electronic Jumper Connectors

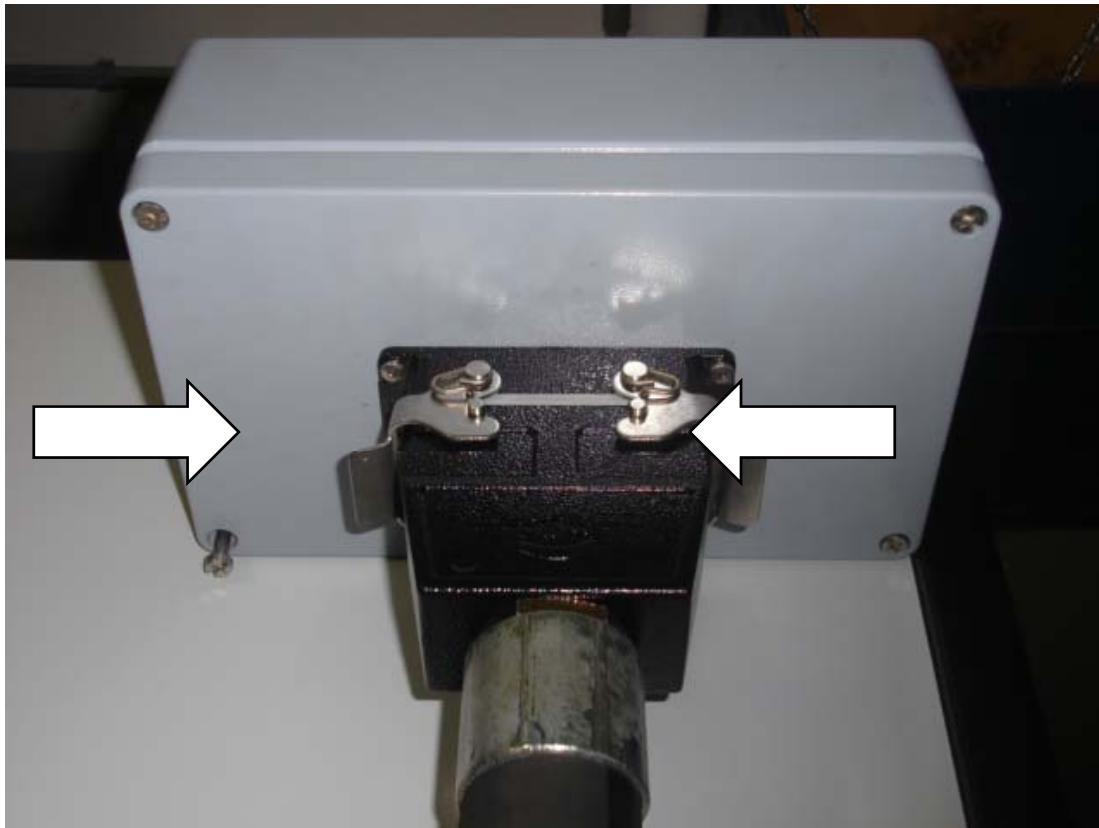


Multipole Cable Connector

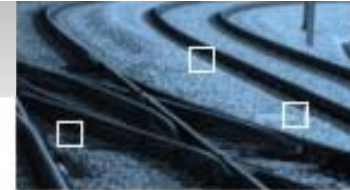


Locking Poles

Electronic Jumper Connectors



Telas da IHM do REJE



a Principal do OBC

(A) Área REJE.

(B) Área de Comandos.

(C) Área de Pressões e Fluxômetro.

(D) Área de Diagnóstico.

MRS COMPUTADOR DE BORDO 31/10/2007 14:37:52 ALSTOM

0.0 Velocidade Real
60 Velocidade Máxima
60 Velocidade Objetivo

ACEL. (km/h/min) 0.0
SENTIDO FRE
MODO DE OPERAÇÃO PERMISSIVO

TPP (min:s) MENSAGEM DO ATC

Km 25 Km 26 Km 27 Km 28 Km 29

TST0001 55 55 0.1%

Km 25 Km 26 Km 27 Km 28 Km 29

Num	Loco	Pt	Bz	PA	Alarme	Amp	Status
2	5216	N	✓	CCO	0		

Faltam 159 metros para o próximo marco
hh:mm Resposta de comandos do Maquinista Rampa:

COMANDOS: B
PSI
RE: 0 CF: 0
EG: 0 RP: 0
Fluxômetro
0.0 cfm

ATC
CCOI
REJE
GPS

A C D

Telas da IHM do REJE



Area REJE

Num	Loco	Pt	Bz	PA	Alarme	Amp	Status
<u>1</u>	◀ 8879	8		✓		123	
<u>2</u>	◀ 7584	3	🔊		PAT	123	
<u>3</u>	◀ 1234	5		✓	PAT	123	
<u>4</u>	◀ 8745	2				1002	
<u>5</u>	9789 ▶	N					2:58
<u>6</u>	6541 ▶	5				1250	
<u>7</u>	2244 ▶	N				0	DESL

Telas da IHM do REJE



Área de Comandos

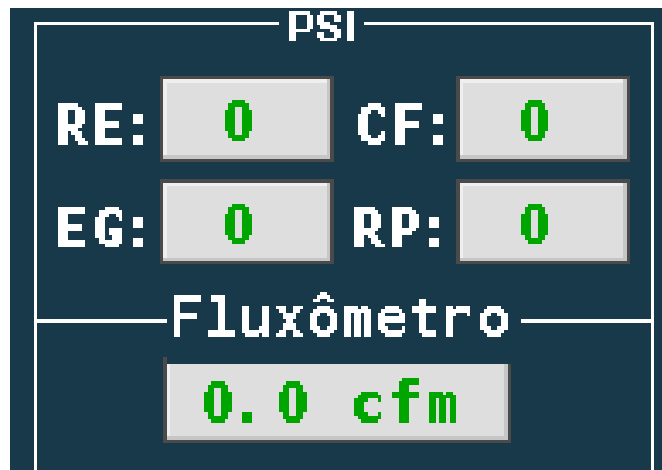
COMANDOS	
<F1>	Isola
<F2>	Desliga
<F3>	Circ. Óleo
<F4>	Partida
<F5>	Rearme
<F6>	Conf. Buz.
<F7>	Liga SAI

Para acionar qualquer comando na comandante, deve-se aguardar alguns segundos, de forma que o sistema tenha tempo suficiente para que o comando seja executado nas comandadas, e seja indicada, na comandante, a confirmação do recebimento do comando.

Telas da IHM do REJE



Área de Pressões e Fluxômetro (C)



RE: Pressão do Reservatório Equilibrante.

CF: Pressão do Cilindro de Freio.

EG: Pressão do Encanamento Geral.

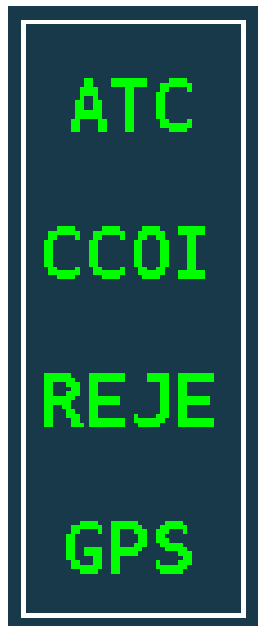
RP: Pressão do Reservatório Principal.

Fluxômetro: Fluxo do Ar Comprimido na Saída do Reservatório Principal Número 2.

Telas da IHM do REJE



Área de Diagnóstico de Comunicação (D)



O texto REJE em Verde indica que a comunicação está estabelecida e em Vermelho indica uma falha de comunicação com o OBC.

Telas da IHM do REJE



Navegação na Tela Padrão de Operação

Na parte inferior da tela Padrão de Operação do OBC está localizado o menu de **Navegação**, conforme a figura a seguir:

Para acessar o **submenu** do REJE deve-se clicar no botão ou através do atalho <**Alt+R**>.



<u>M</u> anutenção	Ctrl	M
Teste de Carga	Ctrl	S
Inf. Sistema <u>a</u>	Ctrl	A
Configur <u>a</u> ção	Ctrl	U

Telas da IHM do REJE



opção Configuração

Configuração	
ATUAL	COMANDO
Detecção	Detecção
AUTOMÁTICO	AUTOMÁTICO
Posição Sentido	Posição Sentido
0	1 FRENTE
Comandante	Comandante
NÃO	NÃO
Estado do comando:	
Confirma	Fechar

Detecção:

- ♦ Automático
- ♦ Manual
 - ♦ Inserir a Posição e o Sentido

Comandante:

- ♦ Sim
- ♦ Não

Condições para uso:

Locomotiva parada.

Manete Reversora Centrada.

Manete de Aceleração no Ponto 0.

Locomotiva Engatada (Jumper Eletrônico Conectado).

Telas da IHM do REJE



opção Manutenção

Manutenção

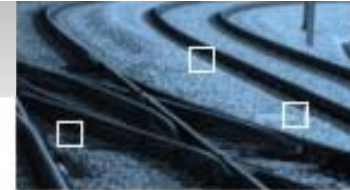
Loco 2: 5216 ← Anterior → Próxima

Veloc.	0.0	Km/h	Imot	0	Amp
EG	89	PSI	RP	125	PSI
RE	89	PSI	CF	0	PSI
OC	55	PSI	OL	30	PSI
Pot.	0	HP	Iexc	0.0	Amp
Igp	0	Amp	Egp	0	Volts
Fluxo	0.0	CFM	Ega	74.0	Volts
Reo	MAX		Nível	0	L x 10

Legenda Fecha



Telas da IHM do REJE



■ Opção Manutenção - Legenda

Legenda	
EG: Encanamento geral	Imot: Corrente de Motor de Tração
RE: Reservatório Equilibrante	RP: Reservatório Principal
OC: Óleo Combustível	CF: Cilindro de Freio
Pot: Potência	OL: Óleo Lubrificante
Igp: Corrente Gerador Principal	Iexc: Corrente de Excitação
Fluxo: Fluxo de Ar no Reservatório Principal	Egp: Tensão do Gerador Principal
Reo: Reostato de Carga	Ega: Tensão do Gerador Auxiliar

Fecha

Telas da IHM do REJE



Opção Teste de Carga

Teste de Carga

Veloc.	0.0	Km/h	Imot	+0	Amp
EG	0	PSI	RP	0	PSI
RE	0	PSI	CF	0	PSI
OC	0	PSI	OL	0	PSI
Pot.	0	HP	Iexc	0.0	Amp
Igp	0	Amp	Egp	0	Volts
Fluxo	0.0	CFM	Ega	0.0	Volts
Reo			Nível	0	L x 10

Teste de Carga **BLOQUEADO** Última Potência **0** HP

Condição Atual

Ponto **+0** Duração **0.0** Min.

Condições de uso para ligar o Teste de Carga:

Chave de Auto Carga Ligada.

Manete de Aceleração no Ponto **1**.

Locomotiva Parada.

Locomotiva Desengatada (Jumper Eletrônico Desconectado).

Telas da IHM do REJE



Informação do Sistema

Informações do Sistema	
LOC0: 9039015	
Versão SW: mrs_v2017. tg	IP REJE:
Modelo locomotiva: C30-7MP	IP OBC: 10. 80. 0. 8
Máscara de subrede: 255. 255. 0. 0	IP CCOI: 10. 80. 0. 8
<input type="button" value="Fecha"/>	

PIP	
Versão: <input type="text" value="00,000"/>	
Diagnóstico	
Placa com falha: <input type="text" value="00"/>	Bateria de memória fraca: <input type="text" value="NÃO"/>
Módulo da placa com falha: <input type="text" value="00"/>	Configuração de IP não concluída: <input type="text" value="NÃO"/>
Erro de leitura dos conversores Analógico Digital: <input type="text" value="NÃO"/>	Erro na leitura do termômetro: <input type="text" value="NÃO"/>
Erro de escrita de saída digital: <input type="text" value="NÃO"/>	Erro da recuperação da Fonte de Excitação: <input type="text" value="NÃO"/>
Ruído de saída digital: <input type="text" value="NÃO"/>	Ruído na falta na Fonte de Excitação : <input type="text" value="NÃO"/>
Sem comunicação entre PIP e REJE: <input type="text" value="NÃO"/>	Erro na leitura da(s) placa(s) de entrada digital: <input type="text" value="NÃO"/>
Erro de posicionamento das placas: <input type="text" value="NÃO"/>	
<input type="button" value="OK"/>	

TrainScout MMI (Display)



F9



Buzina



Logística S.A.



REJE Projeto SIACO

F1



Alarme

F2



Parâmetro

F3



Manutenção

F4



Teste Carga

F5



Info Sistema

F6



Geral

F7



Parâmetro
Avançado

TrainScout MMI (Display)



F9 Buzina	PARÂMETROS				ATAN	F1 Volta	
	Vel. (Km/h)	Acel. (m/min ²)	Freio (PSI)		Operação		
	0,0	-0,0	RE 90	CF 74	CMDD	F2 Detecção	
			EG 90	RP 135		F3 Posição	
			Fluxômetro (cfm) 122			F4 Sentido	
	Atual		Novo			F5 Comandante	
	Auto-deteção						F6 Grava
	Automático						
	Posição						
	3						
	Sentido						
	Frente						
	Comandante						
	Não						

TrainScout MMI (Display)



F9 Buzina	MANUTENÇÃO				F1 Volta
	Vel. (Km/h)	Acel. (m/min ²)	Freio (PSI)		
0,0	-0,0	RE 90	CF 74	LÍDER	F2 Sel +
		EG 90	RP 135		
		Fluxômetro (cfm) 122			
Locomotiva 1		Número de Série 9030221			F3 Sel -
Velocidade 10.3 Km/h <small>(Velocidade da Locomotiva)</small>		Imot 100 Amp <small>(Corrente do motor de tração)</small>			
EG 90 PSI <small>(Pressão de ar do encanamento geral)</small>		RP 140 PSI <small>(Pressão de ar do reservatório principal)</small>			
RE 90 PSI <small>(Pressão de ar do reservatório equilibrante)</small>		CF 0 PSI <small>(Pressão de ar do cilindro de freio)</small>			
OC 50 PSI <small>(Pressão do óleo combustível)</small>		OL 70 PSI <small>(Pressão do óleo lubrificante)</small>			
Potência 1000 HP <small>(Potência da locomotiva)</small>		I Exc 50,2 Amp <small>(Corrente da excitatriz)</small>			
Igp 600 Amp <small>(Corrente do gerador principal)</small>		Egp 120 Volts <small>(Tensão do gerador principal)</small>			
Fluxo 0,0 CFM <small>(Fluxo de ar do reservatório principal)</small>		Ega 73,6 Volts <small>(Tensão do gerador auxiliar)</small>			
Reostato Máximo		Nível 1400 Lx10			

TrainScout MMI (Display)



F9 Buzina	TESTE DE CARGA				ATAN		F1 Volta	
	Vel. (Km/h)	Acel. (m/min ²)	Freio (PSI)		Operação			
	0,0	-0,0	RE 90	CF 74	DES		F2 Liga/ Desliga	
			EG 90	RP 135			F3 Ponto +	
			Fluxômetro (cfm) 122				F4 Ponto Para	
	Velocidade	0.0 Km/h	Imot	0 Amp			F5 Ponto -	
	EG	0 PSI	RP	0 PSI				
	RE	0 PSI	CF	0 PSI				
	OC	0 PSI	OL	0 PSI				
	Potência	0 HP	I Exc	0,0 Amp				
	Igp	0 Amp	Egp	0 Volts				
	Fluxo	0,0 CFM	Ega	0,0 Volts				
	Reostato	Máximo	Nível	0 Lx10				
	Última potência	3800 HP						
	Teste de carga	Desligado						
	Condição atual	Ponto 0,0	Duração	0,0 minutos				

TrainScout MMI (Display)



F9	MRS		GERAL				ATAN	F1	
Buzina	Vel. (Km/h)	Acel. (m/min ²)	Freio (PSI)			Operação	Volta		
F10	0,0	-0,0	RE 90	CF 74	EG 90	RP 135	LÍDER	F2	
Vazio MD			Fluxômetro (cfm)		122			Sel +	
F11	Pos.	Locomotiva	Ponto	Buzina	Porta	Alarme	Corrente (Amp)	Status	F3
Desliga MD	1	9030221	N					Vazio	Sel -
F12	2	9030221	1			BPA	220		F4
Circ. Óleo MD	3	9010342	1				230		Ponto +
F13	4	9040569	4				670		F5
Liga MD	5	9040777	4				1500		Ponto -
F14	6								F6
Conf. Buzina	7								G1
F15									F7
SAI									G2
F16									F8

TrainScout MMI (Display)



F9	MRS	GERAL						ATAN	F1
Buzina	Vel. (Km/h)	Acel. (m/min ²)	Freio (PSI)			Operação		Volta	
F10	0,0	-0,0	RE 90	CF 74	EG 90	RP 135	LÍDER		F2
Vazio MD			Fluxômetro (cfm)			122			Sel +
F11	Pos.	Locomotiva	Ponto	Buzina	Porta	Alarme	Corrente (Amp)	Status	F3
Desliga MD	1	9030221	N					Vazio	Sel -
F12	2	9030221	D1			BPA		Desl.	F4
Circ. Óleo MD	3	9010342	D1				230		Ponto +
F13	4	9040569	D4				670		F5
Liga MD	5	9040777	D4				670		Ponto -
F14	6								F6
Conf. Buzina	7								G1
F15									F7
SAI									G2
F16									F8

TrainScout Structure



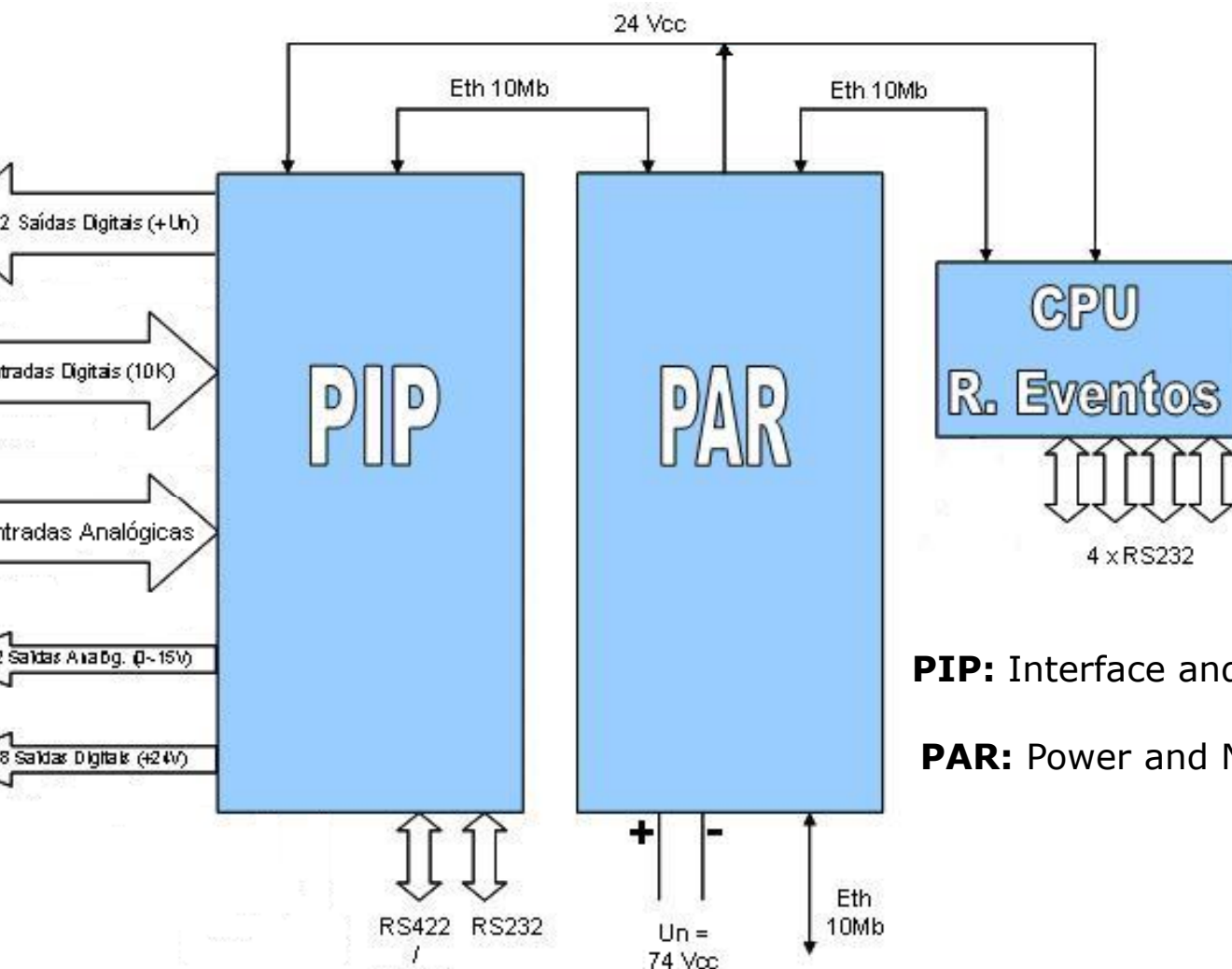
ATNR

Manutenção

Tratamento	25.0 C	0 (m/s)
10.10.20.95	252.255.128.0	02/19/17 18:34:21
10.10.12.98	10.10.12.98	1000020
1010	1011	CNS-RE

ATAN

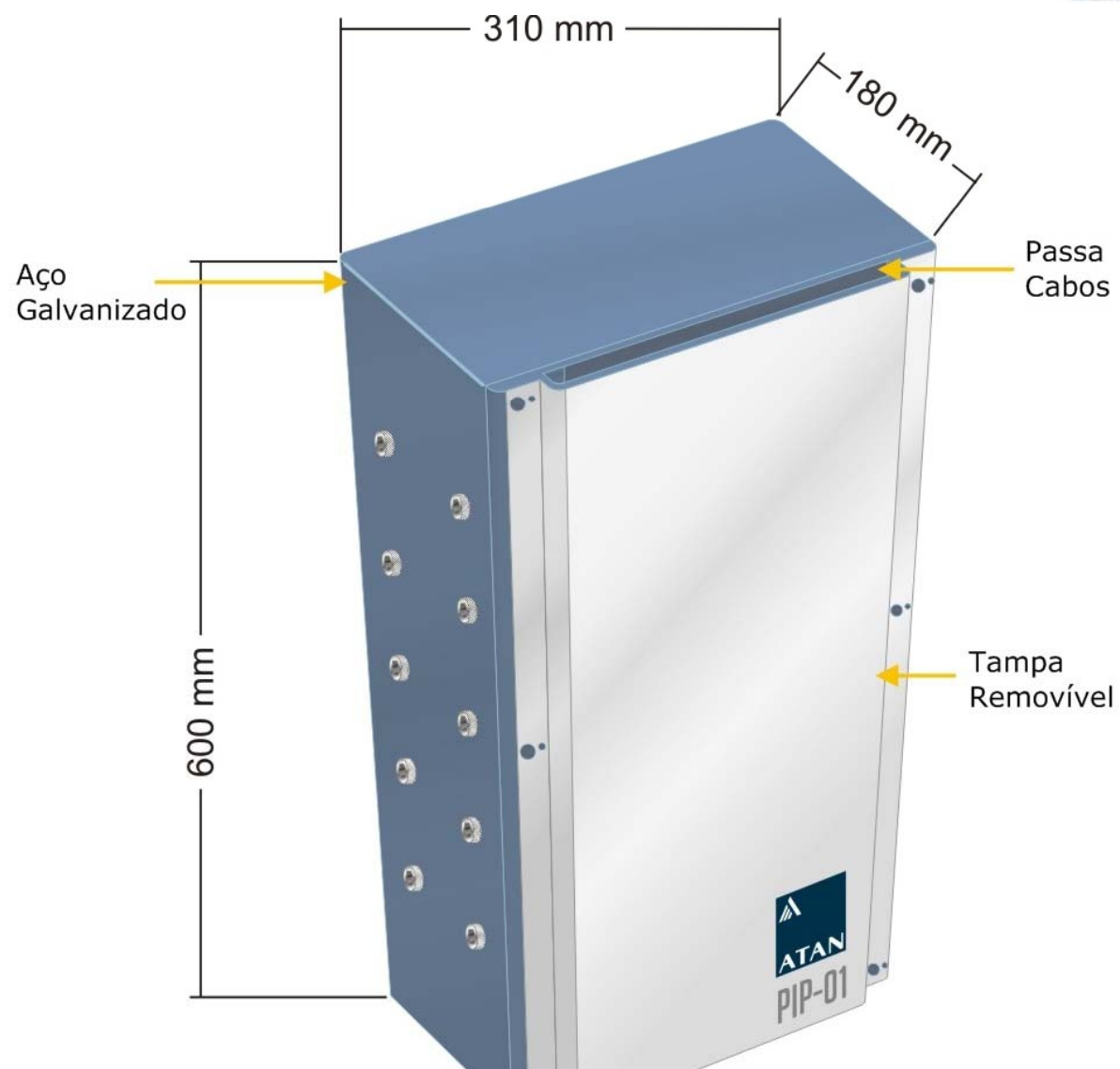
Modular Panels Architecture



PIP: Interface and Processing Panel

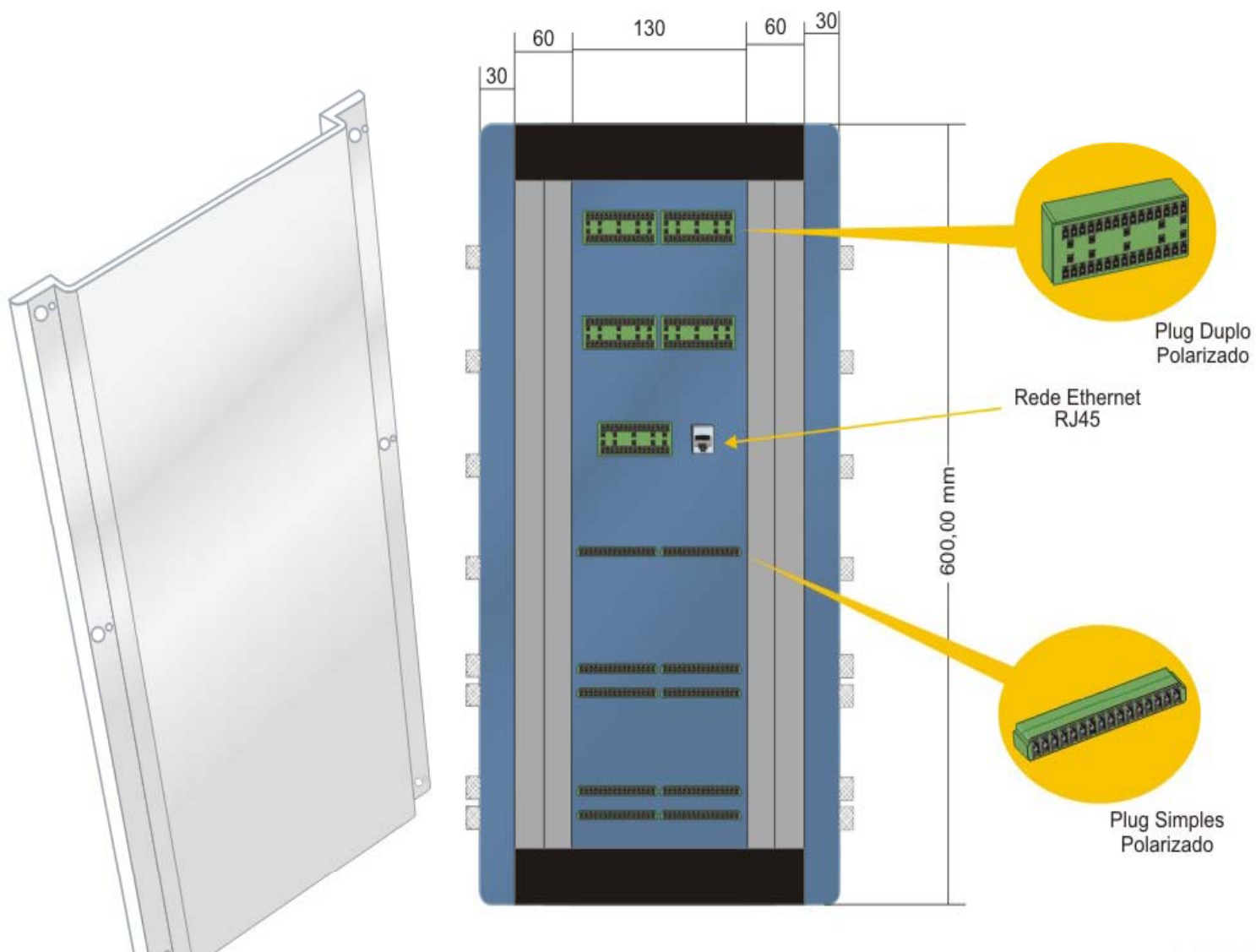
PAR: Power and Network Panel

Módulos PIP&PAR: Perspectiva

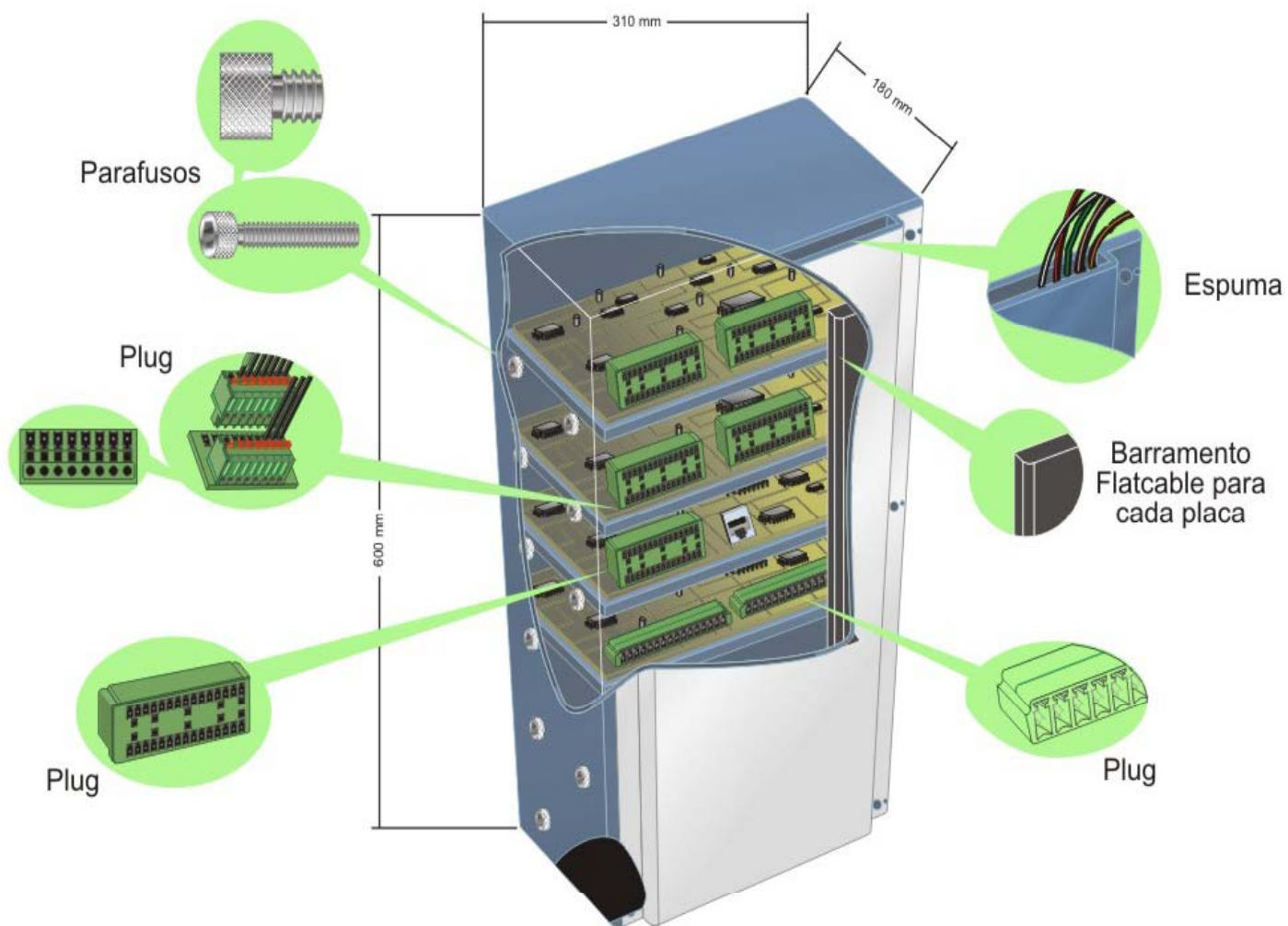




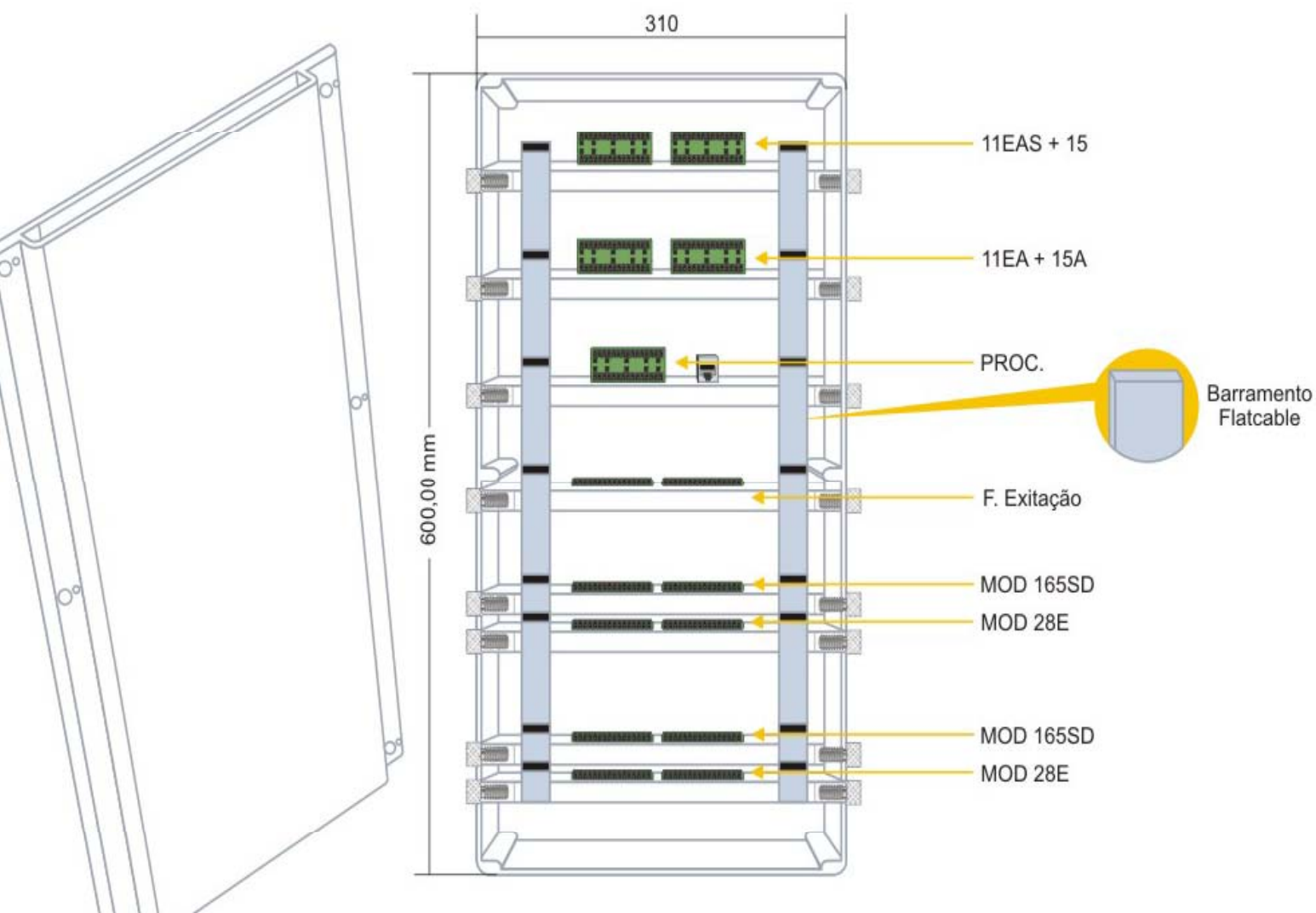
Módulo PIP: Sem tampa externa



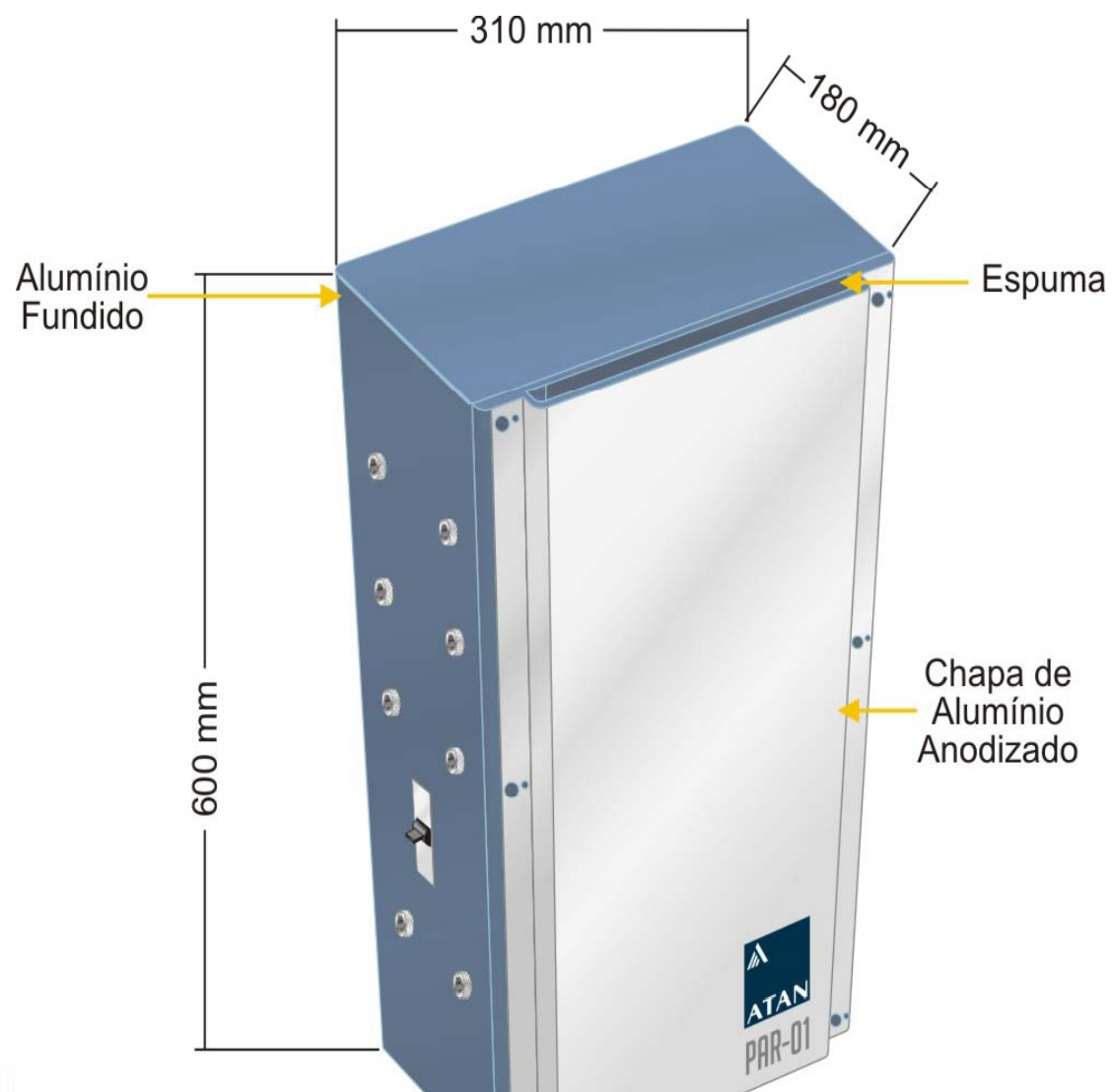
Módulo PIP: Vista em corte



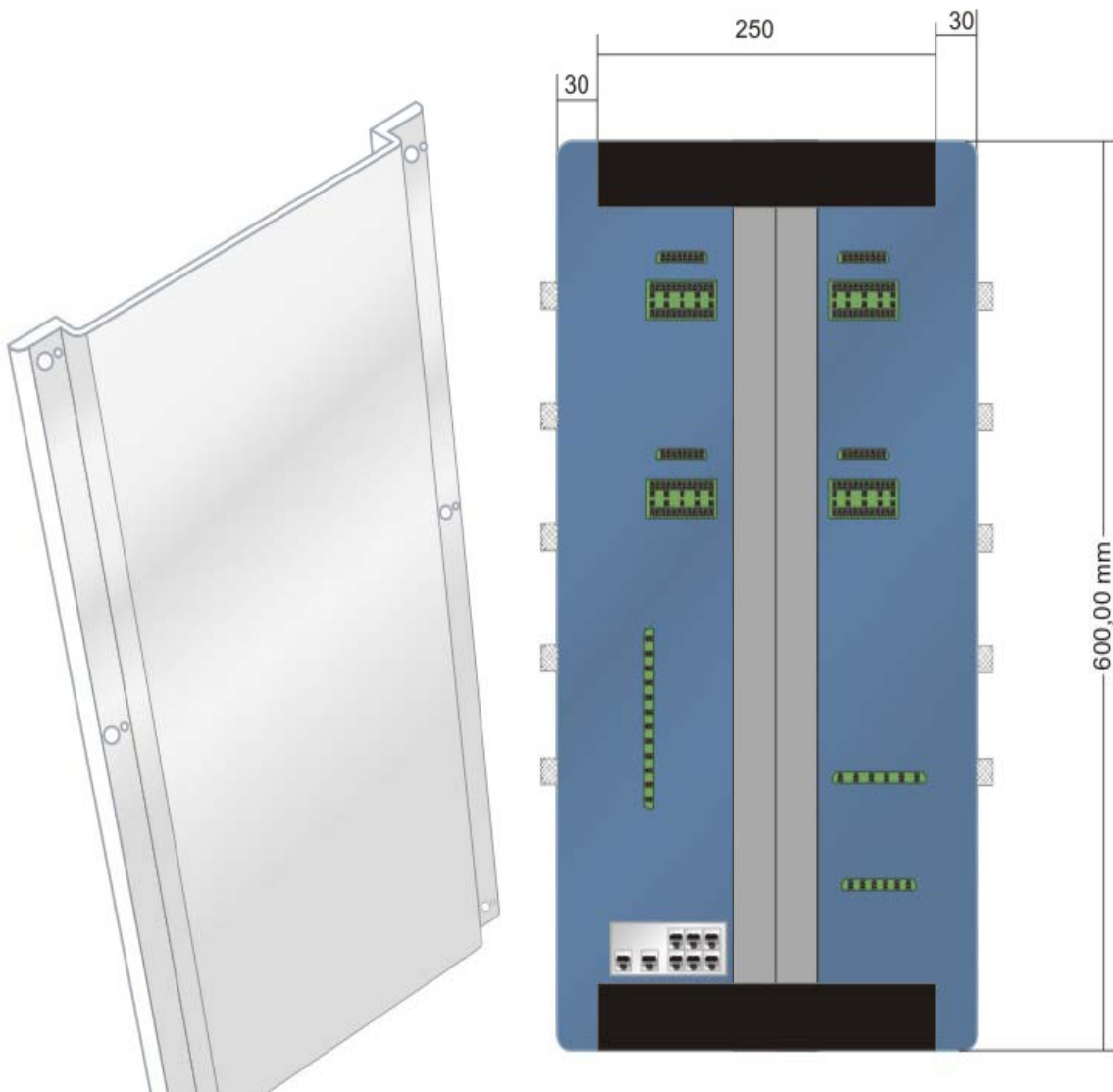
Módulo PIP: Visão interna



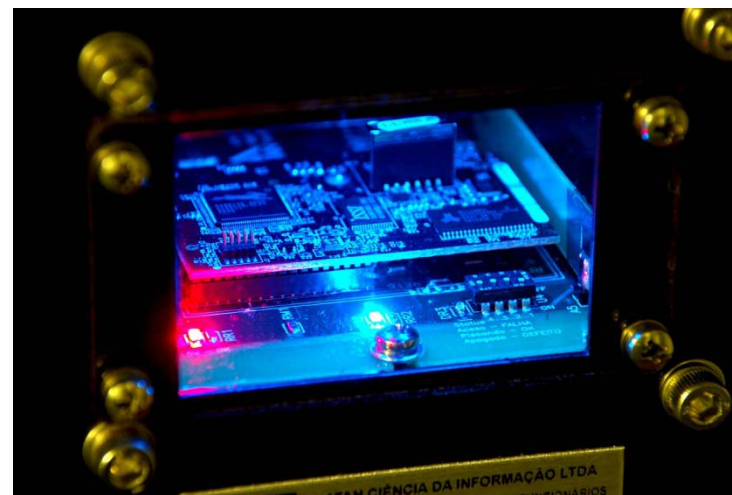
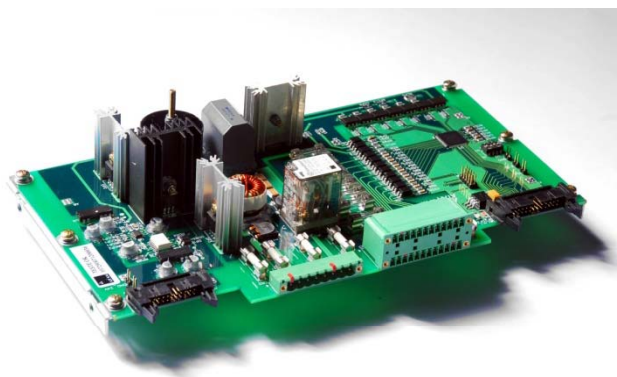
Módulo PAR: Perspectiva



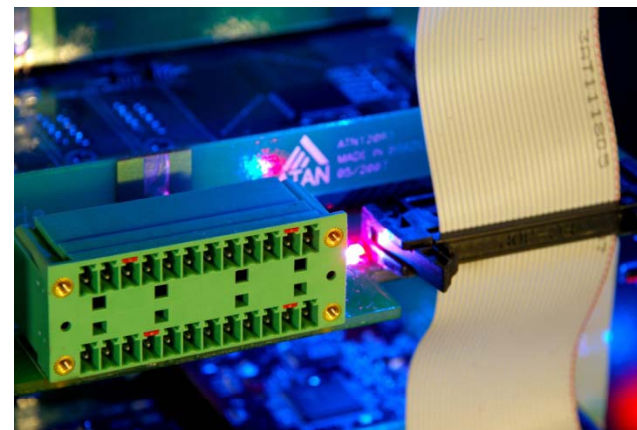
Módulo PAR: Sem a tampa externa



TrainScout - Photos



TrainScout - Photos



TrainScout Certifications



Vibration and Schock: IEC61373, Category 1, Class B;

- Random Vibration Test;
- Shock;
- Simulated long life testing at increased vibration levels;

Electromagnetic Compatibility IEC60571:

- 10.2.2 a) Supply Variations;
- 10.2.2 b) Supply Interruption Test Class S2;
- 10.2.6.1 Supply Overvoltage;
- 10.2.6.2. Surge Wave Form A, 1.8KV 5/50us;
- 10.2.9 Insulation test: 1KV/500V.

Cold: NBR6792 e NBR6795, -10C;

Dry Heat: NBR6817 e NBR6798, +65C;

Wet Heat: NBR5393, 55C 95%.

TrainScout - μ TS



μ TS: Provides the locomotive micro-processing, offering substantial mechanical and operational gains. As all other TrainScout Suite component, it uses the infrastructure platform, adding value and functionalities.

The main functionalities are:

Power and Traction Control

Slip control

Diesel Engine protection

Failure diagnosis

Control of protection devices

General devices control (e.g.: ventilators, compressors, battery charge, etc.)

TrainScout – EPS Rail



EPS Rail: Railway Operation Management Software. This system is implemented in the MES concept for railways and is part of the TrainScout platform.

Every locomotive operation data is analyzed under several dimensions, using advanced analysis tools and powerful dashboards.

EPS Rail and TrainScout platform implement a Data Analysis Integration Management System

TrainScout – EPS Rail



Based on operational situations and events, it is possible

to define the best train conduction practices and

replicate them in order to obtain the Golden Run.

The Golden Run represents the best conduction possible

for the railway company.

TrainScout – EPS Rail



EPS Rail main functionalities are:

Historic Data Analysis

Events Trend Analysis

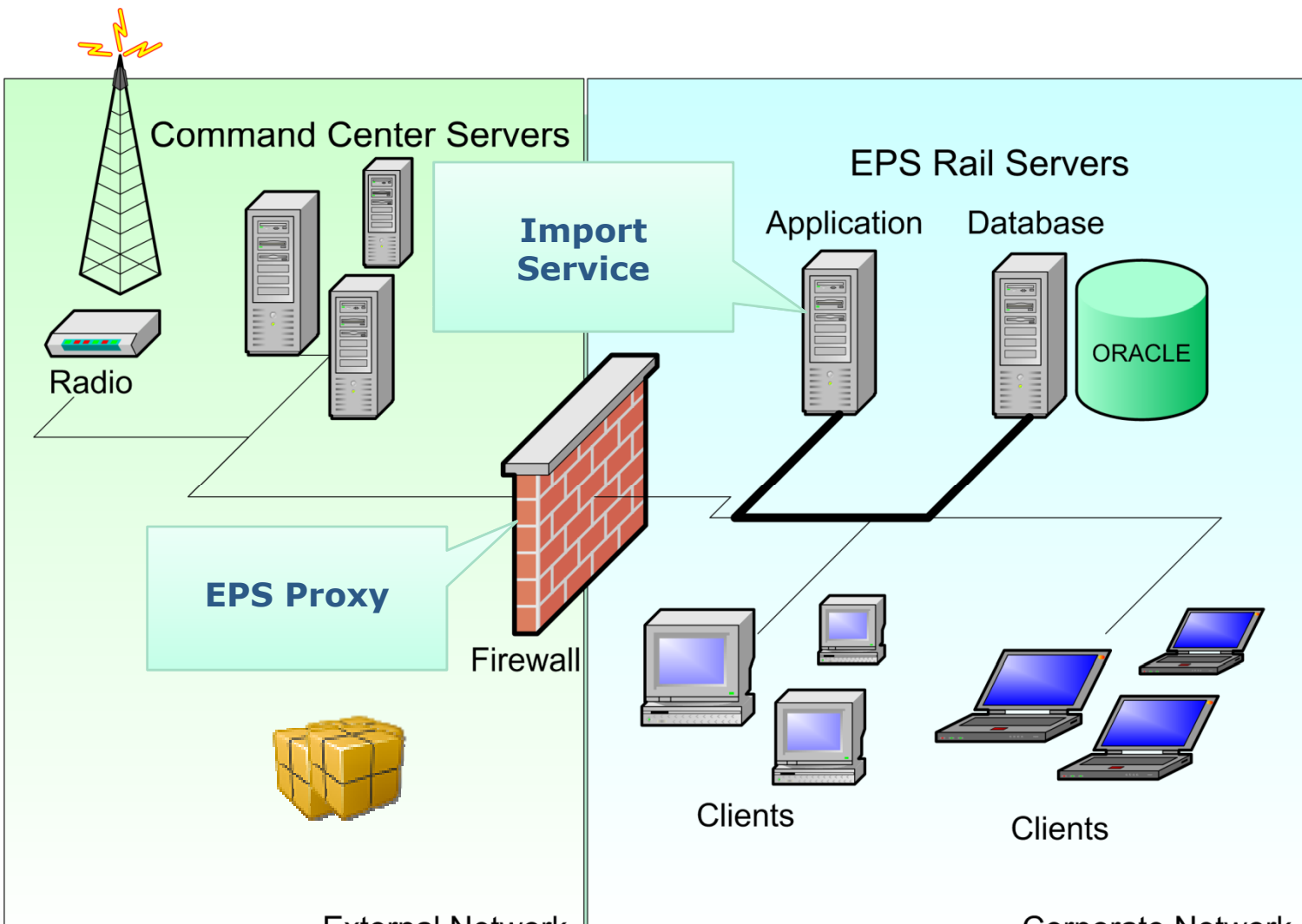
KPIs Trend Analysis

Events Processing

Performance Assessment (KPI)

Management Reports

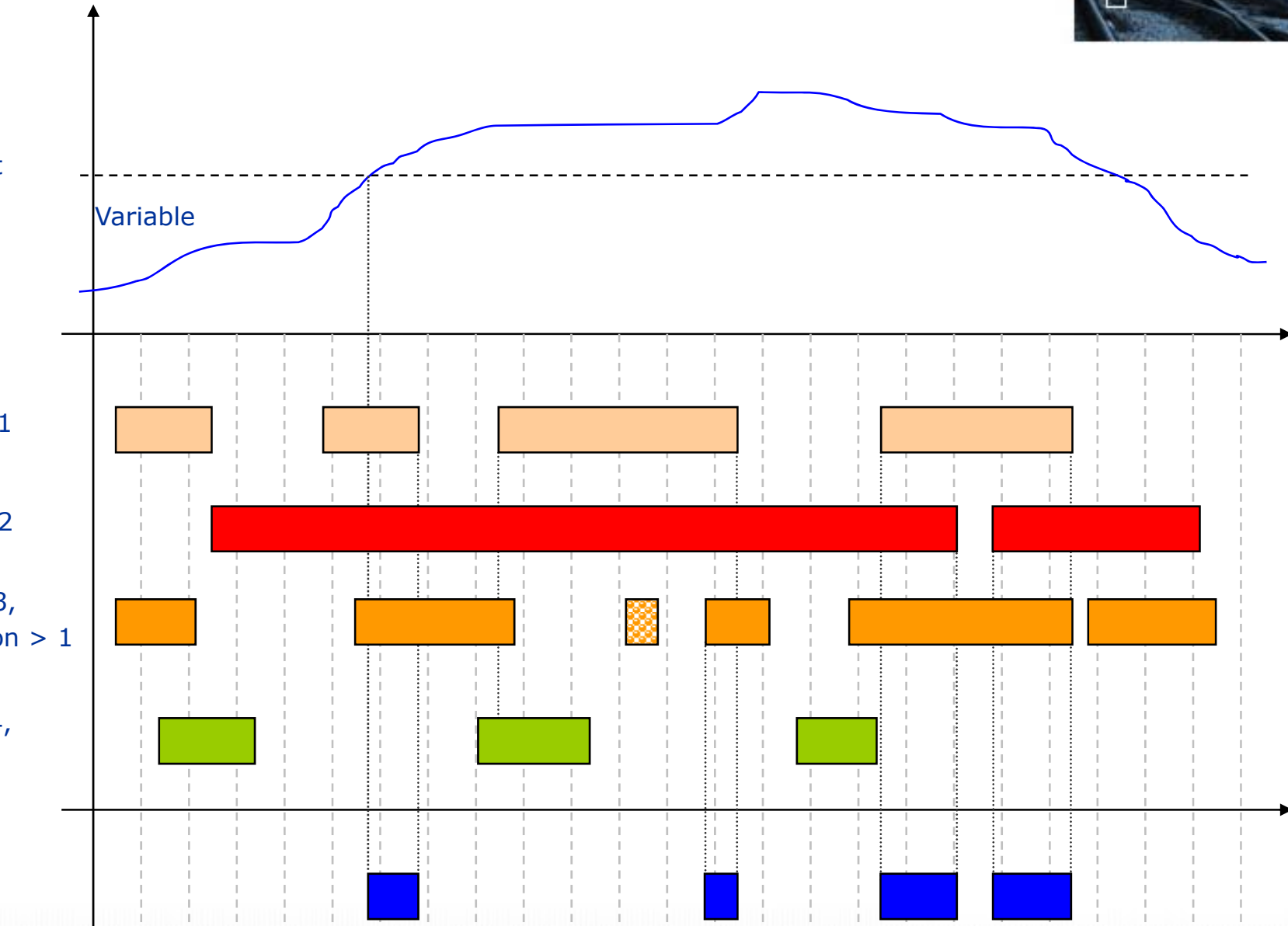
General View



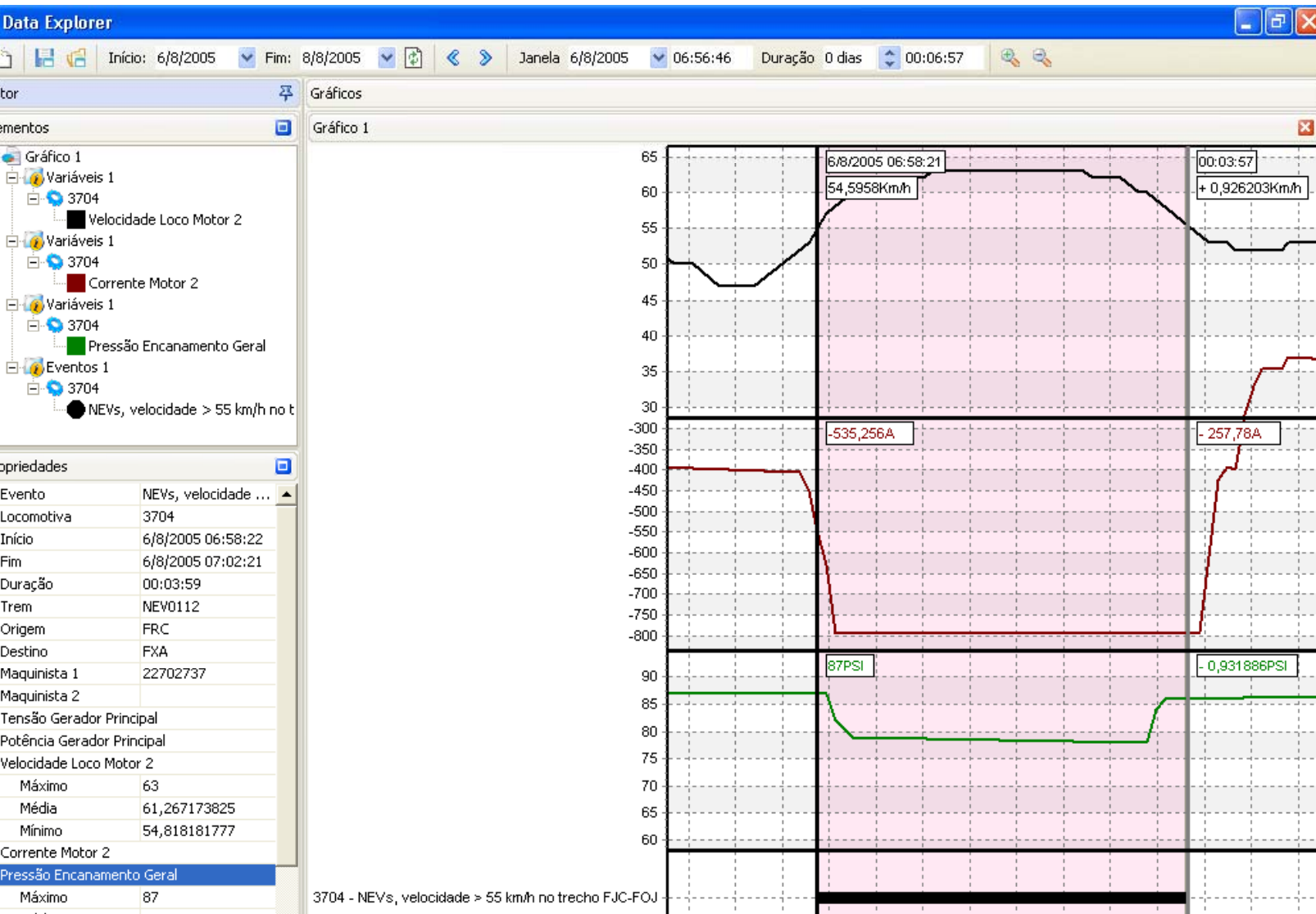
Historical Charts



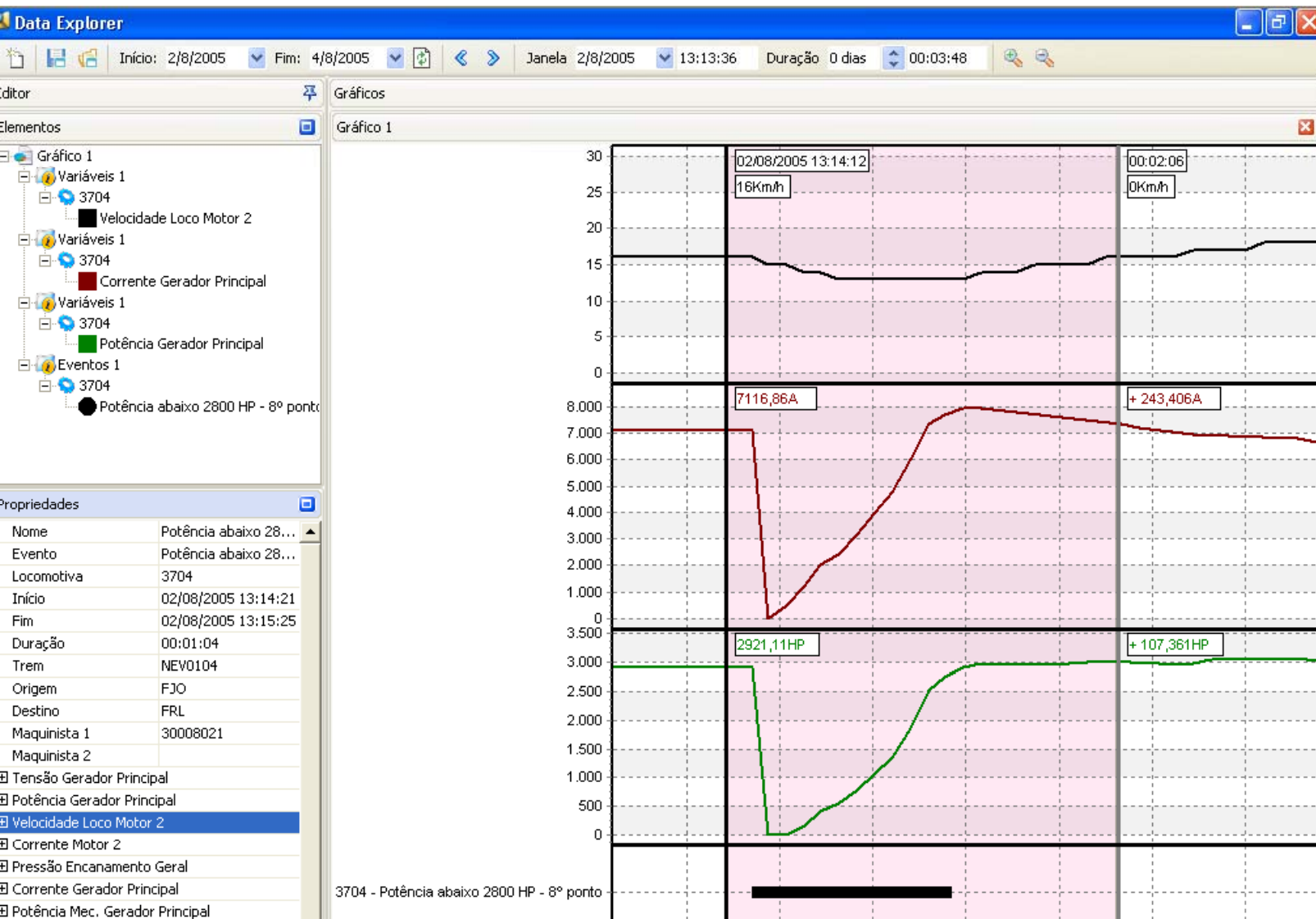
Computed Events Creation



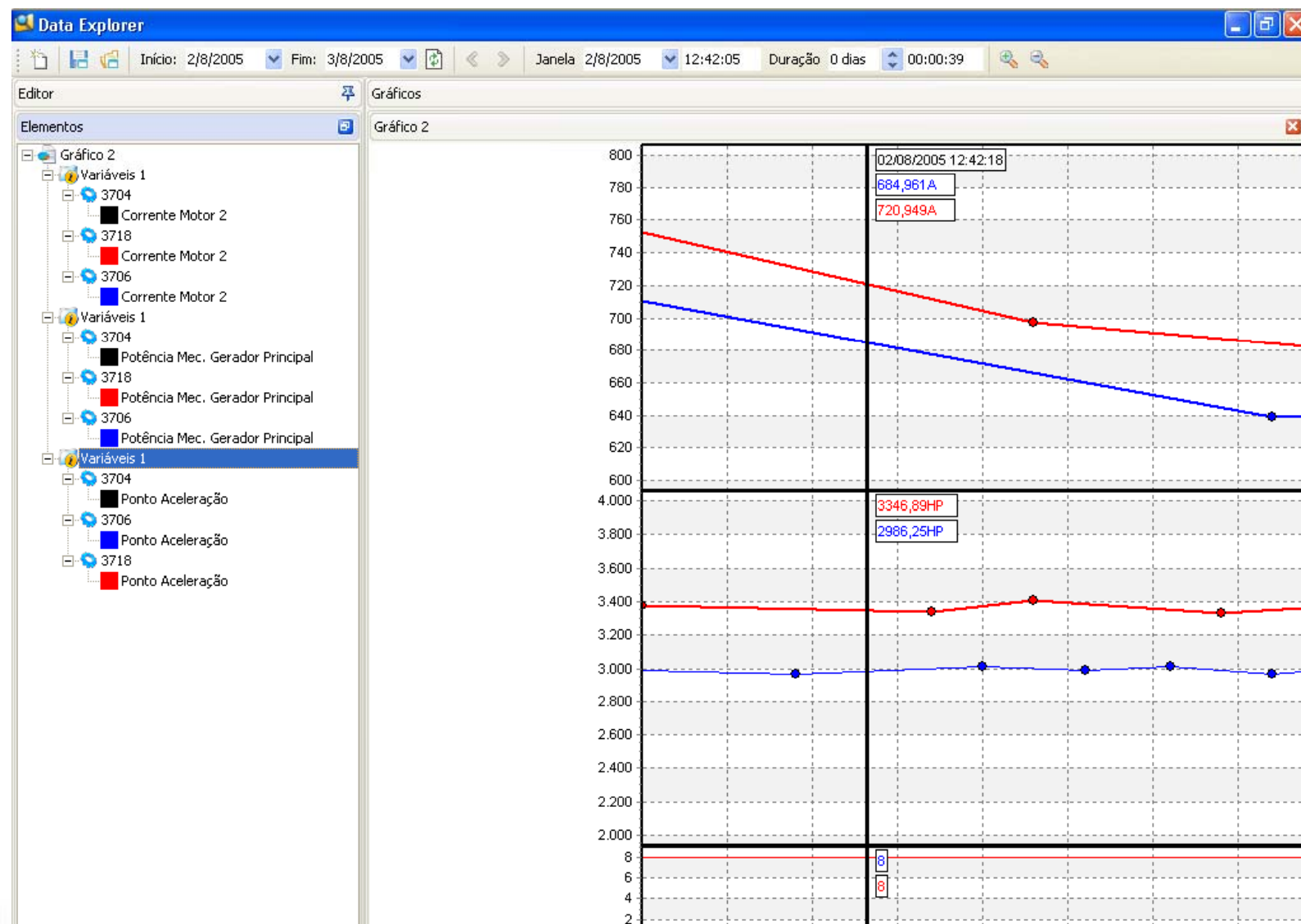
Exemple: Overspeed



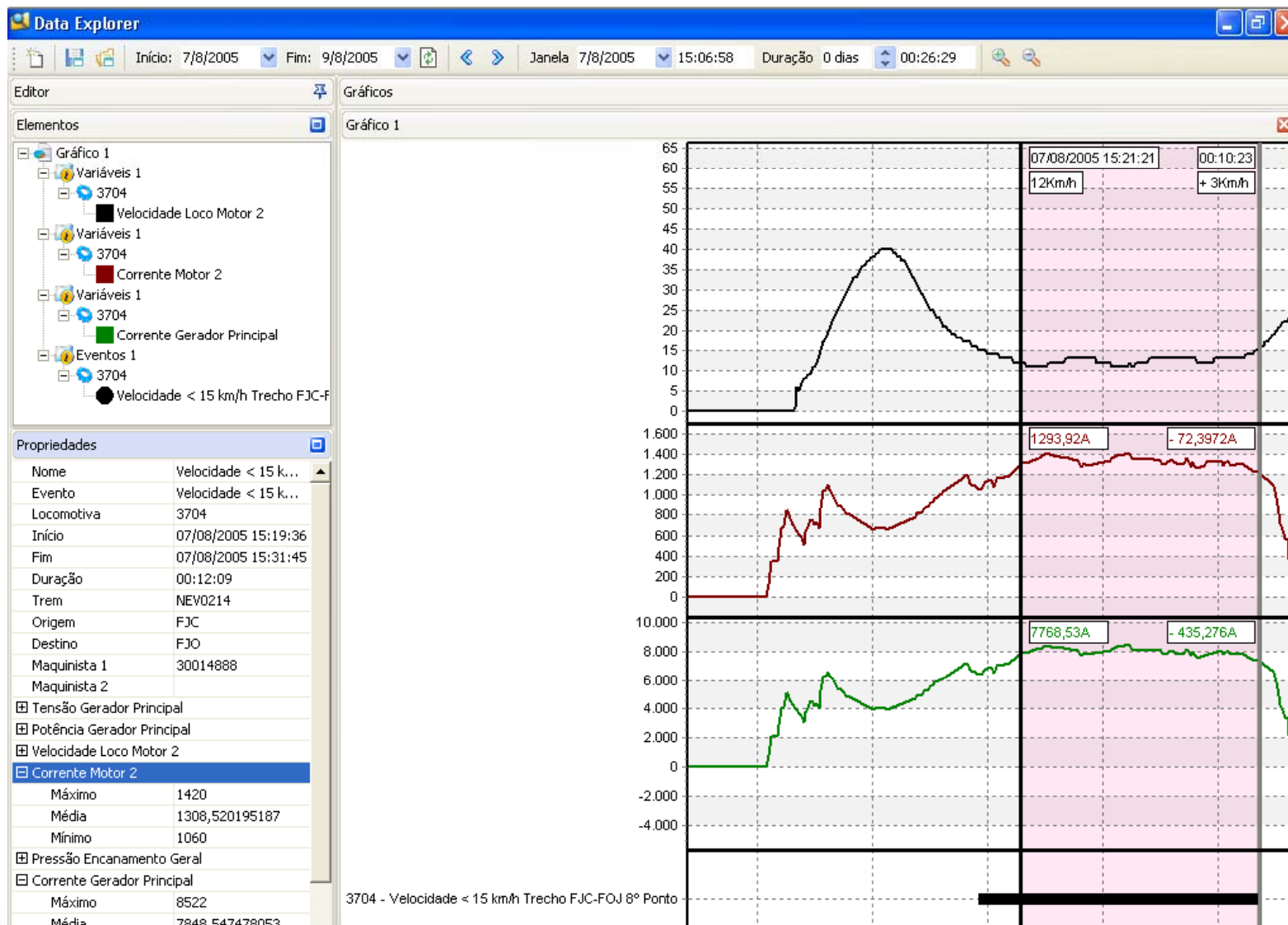
Electric Jumper Failure



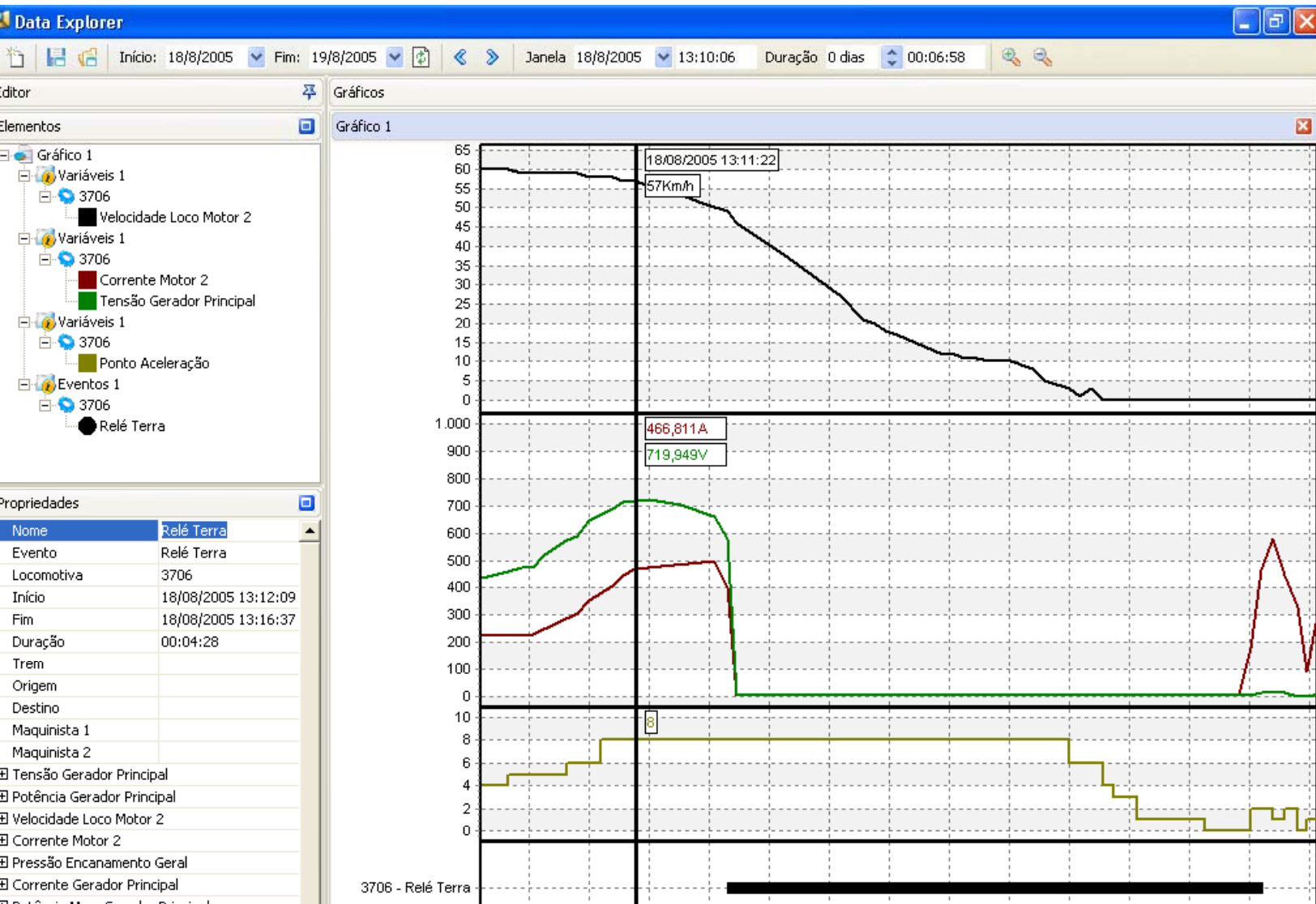
Power Mismatch



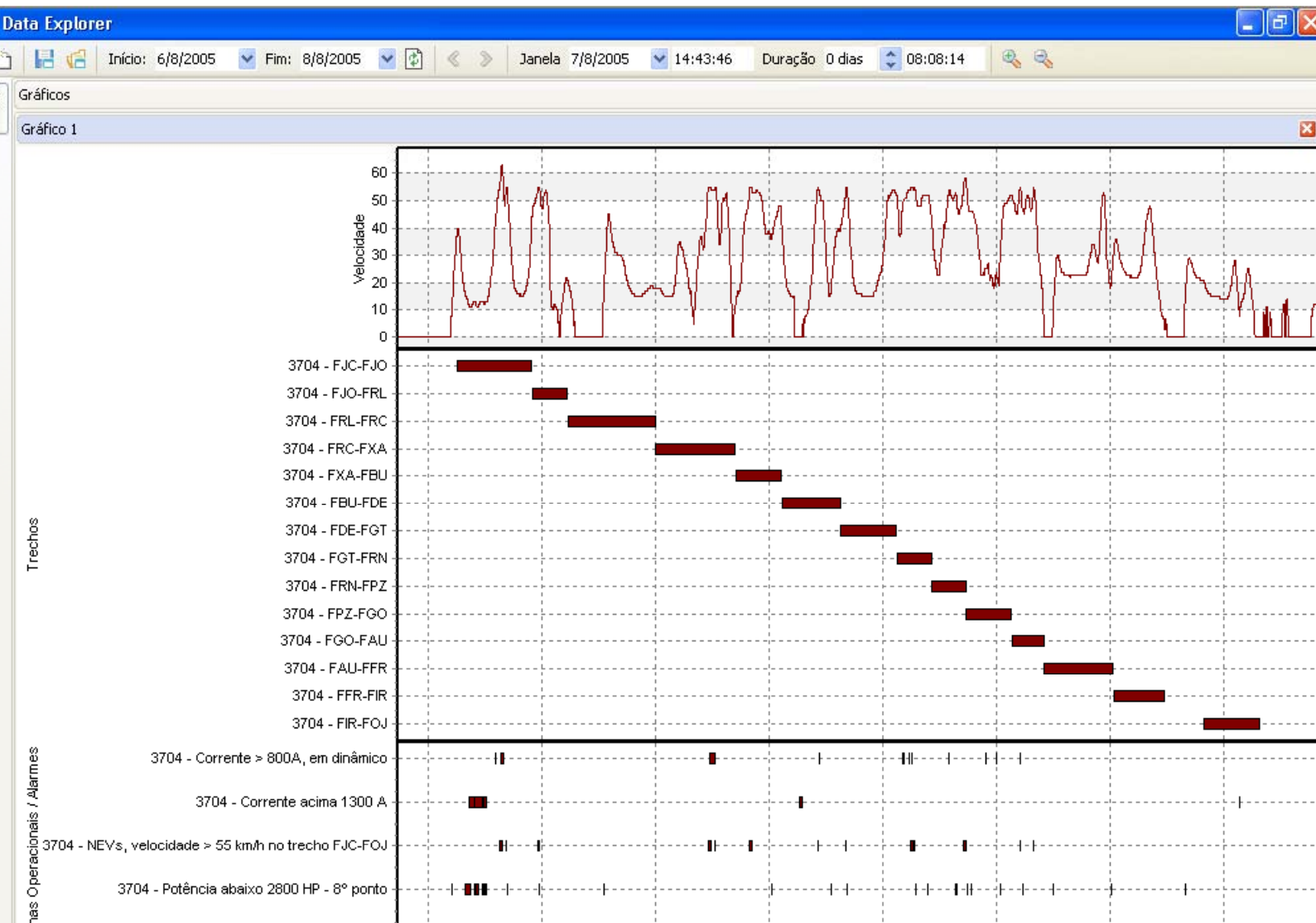
Traction Motor Overcurrent



Ground Relay Actuation



Failures per Rail Segments



Events Report



EPS Rail

Arquivo Operações Configuração Relatórios Supervisão Exibir Ajuda

Lista Autocarga

Painel principal Módulos Locomotivas... Atualizar Imprimir... Ajuda Geral Logar

Lista de Eventos

Voltar Editar Início: 3/1/2005 Fim: 13/11/2006

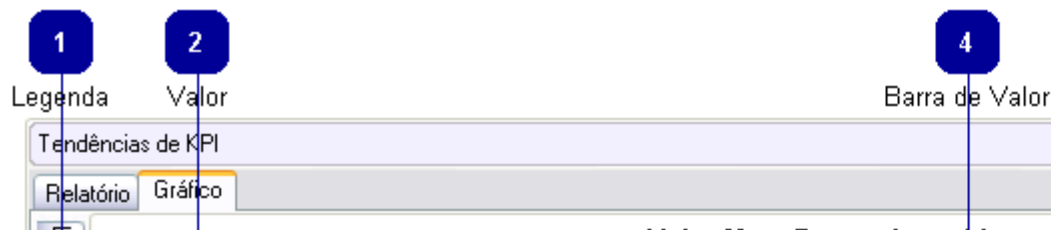
Relatório

LOCO em autocarga		LOCOMOT3_XSA			Maquinista	Trem	Trecho
Início	Duração	Máx.	Min.	Med.			
5/2/2006 00:01:04	23:58:42	43	13	28	40027494	WKK6015	IRG
					40027494	WKK6015	ICG
							ICG-ICG
23/2/2006 02:02:20	21:55:31	44	14	29			FDT-FDT
						W005953	FDT-FDT
						W005953	FBF-FDT
						W005953	
						W005953	FDT-FBF
						W005953	FDT-FDT
							FDT-FDT
						W005853	FDN-FDT
						W005853	FEB-FDN
						W005853	FSM-FEB
						W005853	FSD-FSM
						W005853	FSD-FSD
						W005853	
	W005853	FSD-FSD					
		FSD-FSD					
25/2/2006 00:01:13	23:57:35	45	15	30			FMT-FDS
							FDC-FMT
							FOT-FDC
							FAA-FOT
							FSA-FAA
							FSR-FSA
578:37:26		MAX=59,00	MIN=0,00	AVG=30,12			

Principal Gráficos Eventos Lista de Eventos

CAPS NUM SCRL DVR

KPIs Report



Tendências de KPI

Relatório Gráfico

Valor de KPI

Gráfico

agrupamento.

Descrição	KPI	Data	Valor	Indicador	Meta Superior	Meta Inferior	Tendência	Tipo
Valor Max. Rampa Invertida		1/9/2007	85500	●	90000	80000	↑	Normal
Valor Max. Rampa Invertida		2/9/2007	85500	●	90000	80000	↑	Normal
Valor Max. Rampa Invertida		3/9/2007	82300	●	90000	80000	↑	Normal
Valor Max. Rampa Invertida		4/9/2007	86400	●	90000	80000	↑	Normal
Valor Max. Rampa Invertida		5/9/2007		●	90000	80000	↑	Normal
Valor Max. Rampa Invertida		6/9/2007	86400	●	90000	80000	↑	Normal
Valor Max. Rampa Invertida		7/9/2007	86400	●	90000	80000	↑	Normal
Valor Max. Rampa Invertida		8/9/2007	90000	●	90000	80000	↑	Normal
Valor Max. Rampa Invertida		9/9/2007	92000	●	90000	80000	↑	Normal
Valor Max. Rampa Invertida		10/9/2007	92000	●	90000	80000	↑	Normal
Valor Max. Rampa Invertida		11/9/2007		●	90000	80000	↑	Normal
Valor Max. Rampa Invertida		12/9/2007	79000	●	90000	80000	↑	Normal
Valor Max. Rampa Invertida		13/9/2007	79000	●	90000	80000	↑	Normal
Valor Max. Rampa Invertida		14/9/2007	82400	●	90000	80000	↑	Normal
Valor Max. Rampa Invertida		15/9/2007	85500	●	90000	80000	↑	Normal

Conduction Comparison



de Configuração de Compa
 ação de período e lo
 intervalo de datas das duas viagens
 entre as viagens, clique sobre o bot

Configuração de Viagens

1ª Viagem

Início: 31/12/2006

Fim: 3/1/2007

Locomotiva - 1ª: 3730

Definir Locomotiva

3 Definir Locomotivas

Comparação de Viagens

Viagem 1 - Pericla a 2/10/2007 - Loco: 3773

Trecho	Duração	Quant.Homem morl	Dur.Méd.Homem m	Méd.RAMPAINV
00003V0000000005H-00003V0000000004i	04:50:00	3,00	00:27:45	48.999
00003V0000000005c-00003V0000000005b	03:00:00	3,00	00:36:35	34.224
00003V0000000005b-00003V0000000005H	06:00:00	4,00	00:55:01	36.276
00003V0000000004i-00003V0000000005c	06:00:00	2,00	01:21:20	59.670
DMF-DMF	03:00:00	1,00	02:18:54	22.732
Total Geral	22:50:00	13,00	Méd.: 00:54:58	Méd.: 41.295

Viagem e Coluna selecionada

Comparação de Viagens

Viagem 2 - Pericla a 2/10/2007 - Loco: 3773

Trecho	Duração	Quant.Homem morl	Dur.Méd.Homem m	Méd.RAMPA
00003V0000000005H-00003V0000000004i	04:50:00	3,00	00:27:45	48.999
00003V0000000005c-00003V0000000005b	03:00:00	3,00	00:36:35	34.224
00003V0000000005b-00003V0000000005H	06:00:00	4,00	00:55:01	36.276
00003V0000000004i-00003V0000000005c	06:00:00	2,00	01:21:20	59.670
DMF-DMF	03:00:00	1,00	02:18:54	22.732
Total Geral	22:50:00	13,00	Méd.: 00:54:58	Méd.: 41.295

Viagem e Coluna selecionada

Conduction Comparison



Comparação de Viagens

Quant.Homem morto Dur.Méd.Homem morto

Eventos Visíveis

Méd.RAMPAINV Méd.Segundos

Eventos - Comparação de Viagens Variáveis de Processo - Comparação de Viagem

Colunas Visíveis

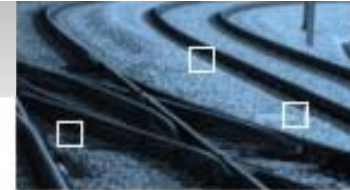
Viagem 1 - Período: 1/10/2007 a 2/10/2007 - Loco: 3773

Duração	Quant.Homem morto	Dur.Méd.Homem morto
04:50:00	3,00	00:27,45
03:00:00		

Comparação de Viagens

Trecho	Viagem 1 - Período: 1/10/2007 a 2/10/2007 - L			Viagem 2 - Períod	
	Duração	Quant.Homem mort	Méd.Segundos	Duração	Quant.H
00003V0000000005c-00003V0000000005b	03:00:00	3,00	52.175,83	03:00:00	
00003V0000000005b-00003V0000000005H	06:00:00	4,00	50.123,75	06:00:00	
00003V0000000004i-00003V0000000005c	06:00:00	2,00	26.730,00	06:00:00	
DMF-DMF	03:00:00	1,00	63.667,50	03:00:00	
Total Geral	18:00:00	10,00	Méd.: 47.415,00	18:00:00	

Events Trend Reports



Tendências de Eventos

Relatório Gráfico

Área de agrupamento.

Período de 1 dia(s)	Quantidade de Ocorrências			
	Valor	Diferença do Anterior	Média Acumulada	Diferença da Média
04/01/07	2		2,00	
05/01/07	1	-1	1,50	-0,50
06/01/07	1	0	1,33	-0,33
07/01/07	1	0	1,25	-0,25
08/01/07	4	3	1,80	2,20
09/01/07	4	0	2,17	1,83
10/01/07	3	-1	2,29	0,71
11/01/07	17	14	4,13	12,88
12/01/07	16	-1	5,44	10,56
13/01/07	1	-15	5,00	-4,00
14/01/07	2	1	4,73	-2,73
15/01/07	4	2	4,67	-0,67
16/01/07	52	48	8,31	43,69
17/01/07	12	-40	8,57	3,43

MED=30,313

Principal Tendências de Eventos

1
Período

2
Dados

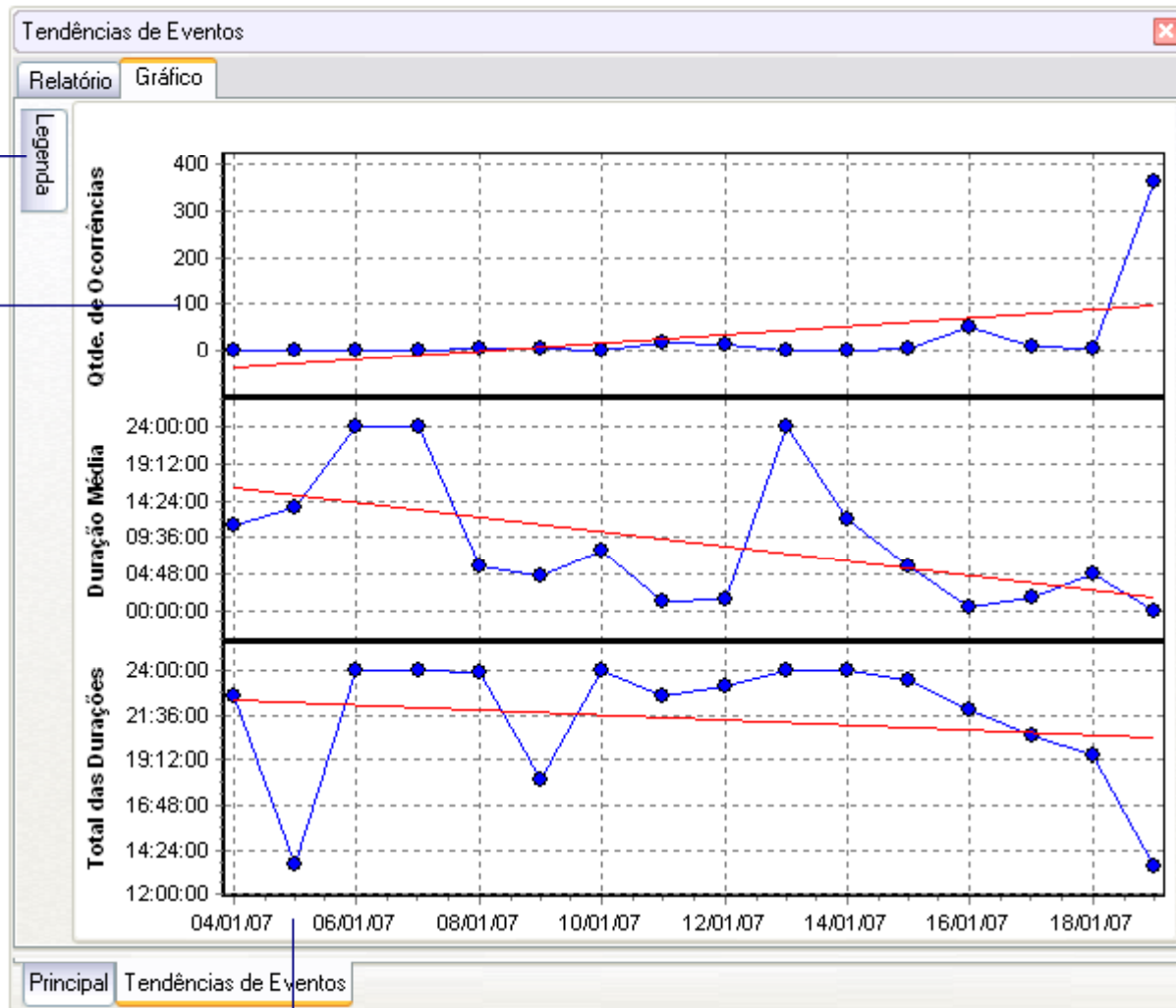
3
Área de Sumário

Events Trend Graphic



1
Legenda

2
Valor



Sinoptics



Windows application interface for "EPS Rail".

Windows Title Bar: <Novo> | EPS Rail

Navigation Tabs: Módulos | Filtros | Esquema | **Sinótico**

Control Panel:

- Buttons: Iniciar (play), Pausar (pause), Parar (stop), Anterior (left arrow), Próximo (right arrow)
- Zoom: 0% | Zoom: 120
- Status: Parado
- Data: 16/4/2008
- Status - Sinótico

Left Panel: Objeitos / Propriedades

Main Display Area:

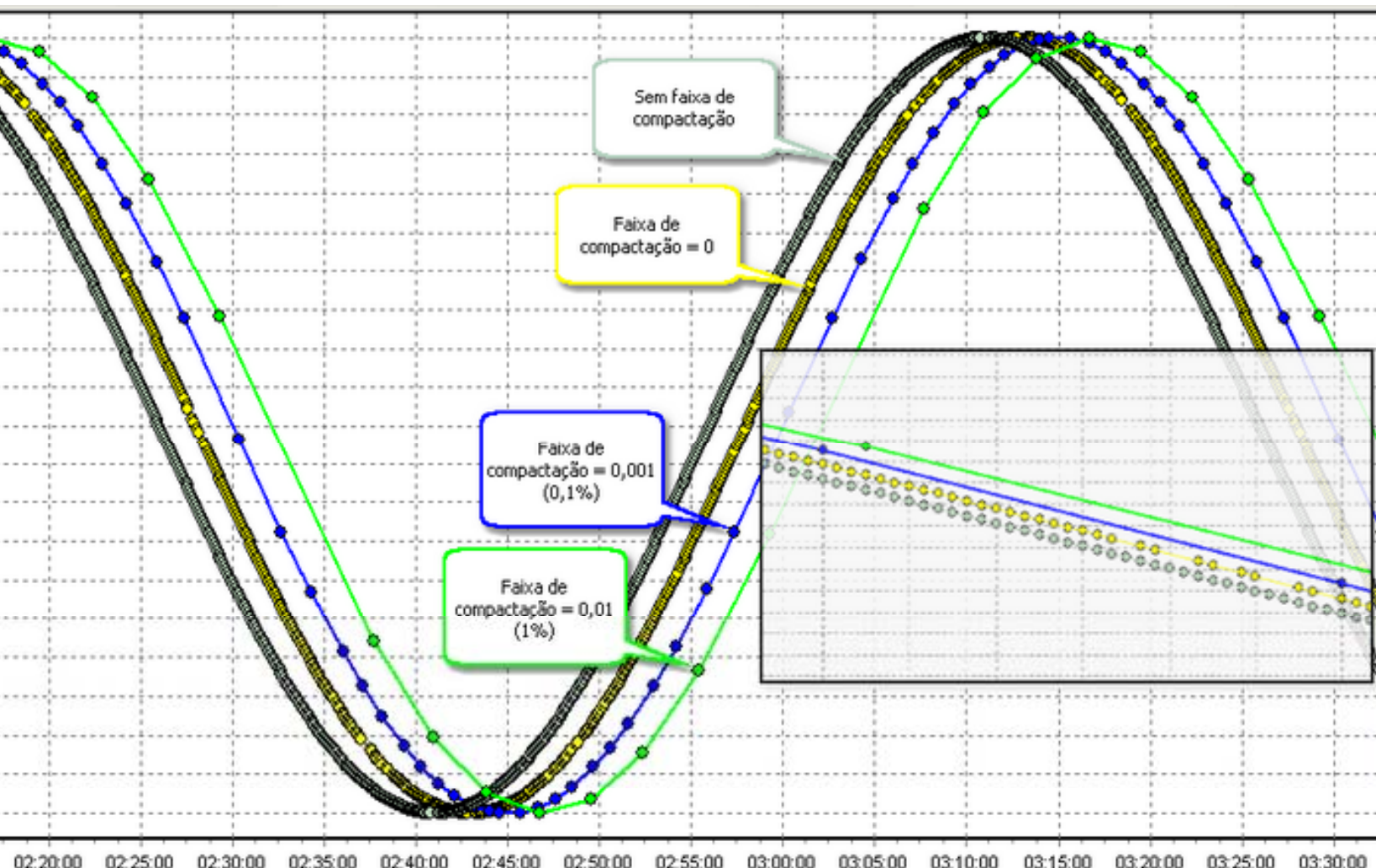
Bottom Panel: Principal | **Sinótico**

Sinoptics



34 Km/h		514 Amp		Back BUZINA
0 Km/h min		104 L x 10		ALARME
EG	89 PSI	RP	98 PSI	F1 ALARME
RE	91 PSI	CF	99 PSI	F2 MANUT
Fn/F6 SAI		Fn/F5 CMD		F3 GERAL
▲ PONTO		2		F4 PARAM
▼				

Data Compression



EPS Rail Examples



[Mudança ordem de coluna no relatório](#)

[Mudança ordem de coluna no sumário](#)

[Configurar eventos calculados](#)

[Grupando colunas - Olap](#)

[Grupando colunas de sumários - OLAP](#)

[Movendo colunas para área de filtro - OLAP](#)

[Inserindo novo gráfico](#)

[Aplicando Zoom no gráfico](#)

