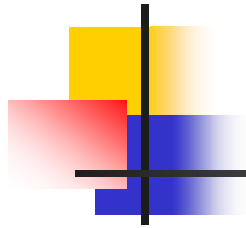




ALTO RIOM ETHERNET

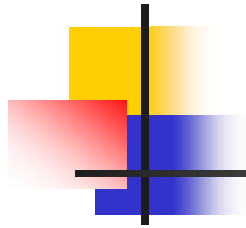




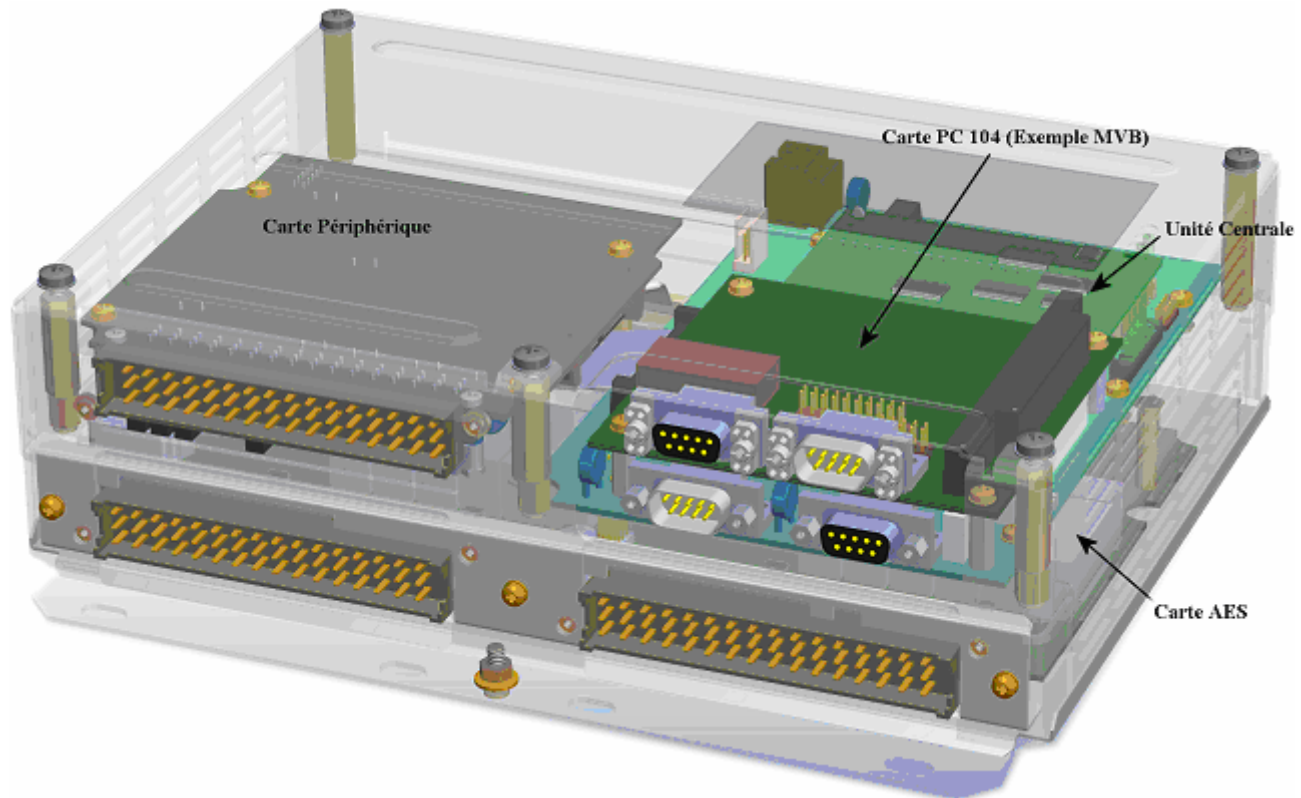
ALTO RIOM ETHERNET

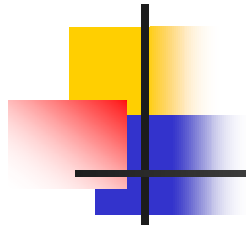
- Railway embedded compact PLC
 - Ⓢ Comply with the EN 50155 standard
 - Ⓢ Customized application in C++ language or IEC 1131-3

- Designed to integrate embedded architecture in the train (TCMS)



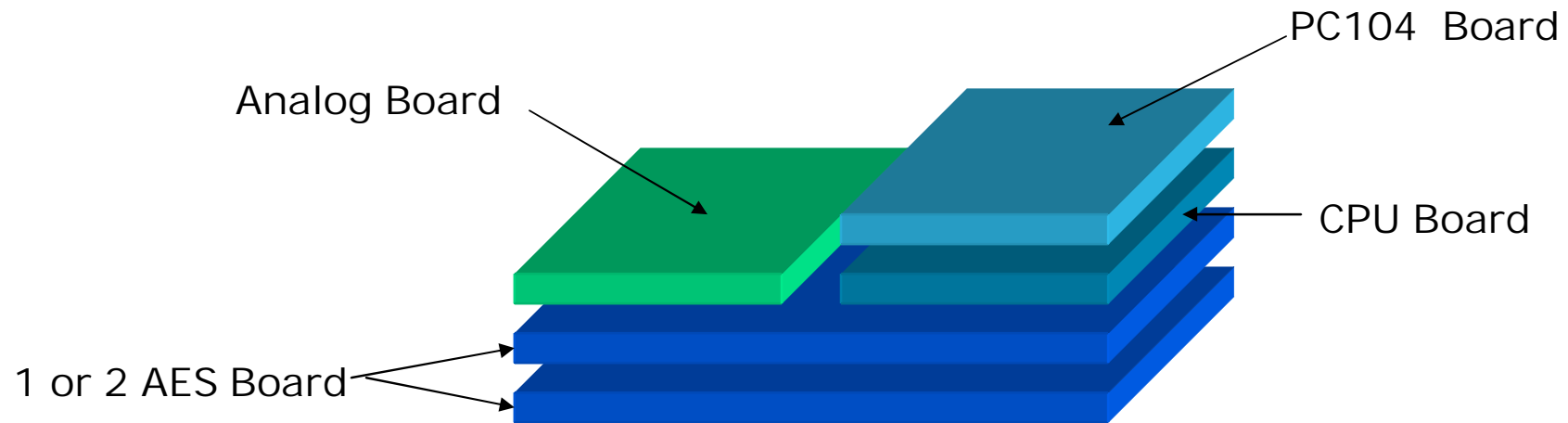
Hardware Architecture





Hardware Architecture

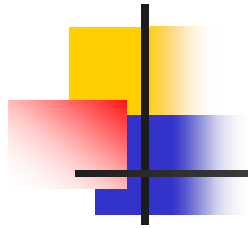
- The product consists of a stack of boards :





AES Board

- Power supply : 24VDC or 72-110V DC -30% +25%
- 32 logic inputs. 10mA
- 16 relay outputs 8A/30Vdc – 0.4A/110Vdc
 - ⦿ 8 relays Active / Common
 - ⦿ 8 relays Active / Inactive / Common
- ALTO RIOM allows 2 AES Boards => 64 inputs / 32 relay outputs



CPU Board

- PXA 255/270 processor (300 Mhz)
- 16 Mo FlashROM – 32 Mo RAM

Communications

- 1 Ethernet channel (M12 connector)
- 1 CAN channel
- 2 RS232/RS485 serial links
- 1 PC104 Interface



Analog Board (optional)

- 4 analog inputs
 - ⦿ $\pm 10\text{V}$ and $\pm 20\text{mA}$
 - ⦿ 12 bits resolution
- 4 analog outputs (V or I)
 - ⦿ 0 – 10V and 0 – 20mA
 - ⦿ 12 bits resolution
- 4 serial links : RS232 or RS485
- Internal power supply (15V-5W) for analog sensors



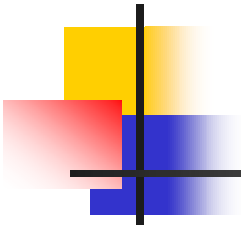
PC 104 Board (optional)

- Mainly for communication add-on
 - ⦿ Carte PC104 Main Vehicule Bus (MVB)
 - ⦿ Carte PC104 Can

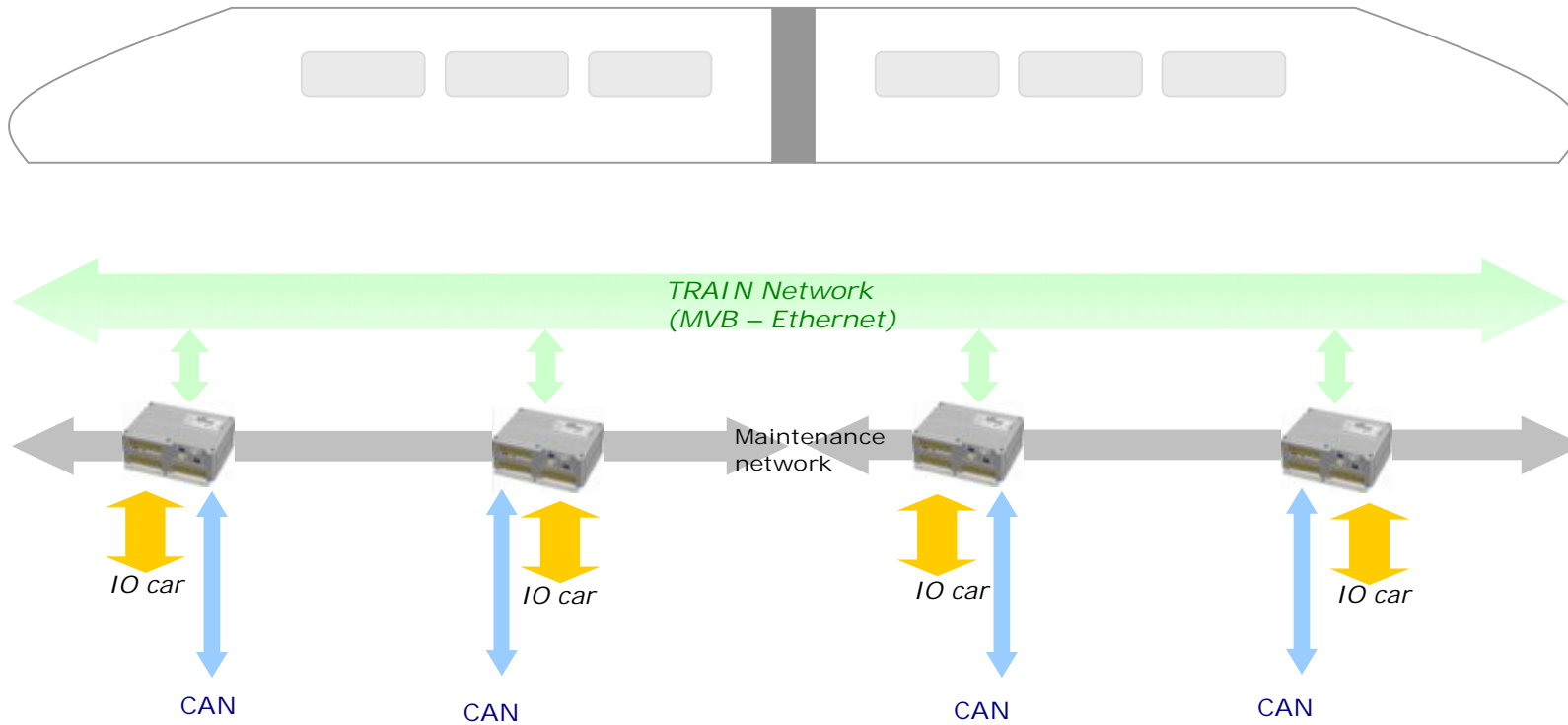


Secure product

- Designed according to EN61508/EN50126 process (SIL)
 - ⊗ Dreaded events :
 - « *To detect false state of input logic AFTER 100ms*»
 - « *To detect false ON state relay output AFTER 100 ms.*»
 - « *To detect analog input failure (calibrating error or cut sensor) AFTER 100 ms. ».*



TCMS Architecture

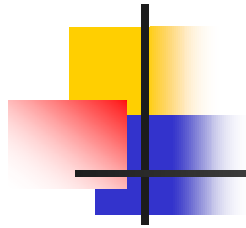


Doors, brakes, air conditioning, heating, lighting



Alto RIOM : 3 functions in TCMS

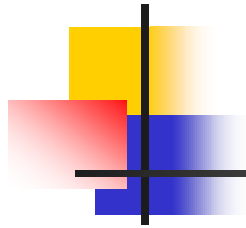
- Embedded PLC
 - ⊗ To control brakes, doors, lighting, heating, air conditioning
- Remote Input/output module of the main computer
- Gateway between Train network (MVB – Ethernet) and network car (CAN – other serial link)



Main references

Underground References

✿	<i>Shanghai</i>	<i>Underground</i>
✿	<i>Ximine</i>	<i>Underground</i>
✿	<i>Sidney</i>	<i>Underground</i>
✿	<i>Mexico</i>	<i>Underground</i>
✿	<i>London</i>	<i>Underground</i>
✿	<i>Paris</i>	<i>Underground (MF2000)</i>
✿	<i>Lisbon</i>	<i>Underground</i>
✿	<i>Singapore</i>	<i>Underground</i>
✿	<i>Barcelona</i>	<i>Underground</i>
✿	<i>Pusan</i>	<i>Underground</i>
✿	<i>London Circle Line</i>	<i>Underground</i>



Main references

Other train and tram references

- ✿ *Madrid* *RER – Cercanias*
- ✿ *Aussburg* *DB Frame*
- ✿ *SWEDEN* *X60*
- ✿ *Copenhagen*
- ✿ *BRAZIL* *Fortaleza*
- ✿ *English* *Juniper – WCML*
- ✿ *Budapest*
- ✿ *Jerusalem* *Tramway*

- ✿ *Selected by ALSTOM Transport for Citadis and TGV products*



Technical specifications (details)



Document Microsoft
Word