



# ACS Safety programmable controller



**Secured inputs/outputs  
Linux PLC**



**C programming or  
IEC61131-3 languages  
with ISaGRAF V5**



**Railways  
Energy  
Industry**

**Power supply sub-stations  
High Voltage control command  
Safety systems**



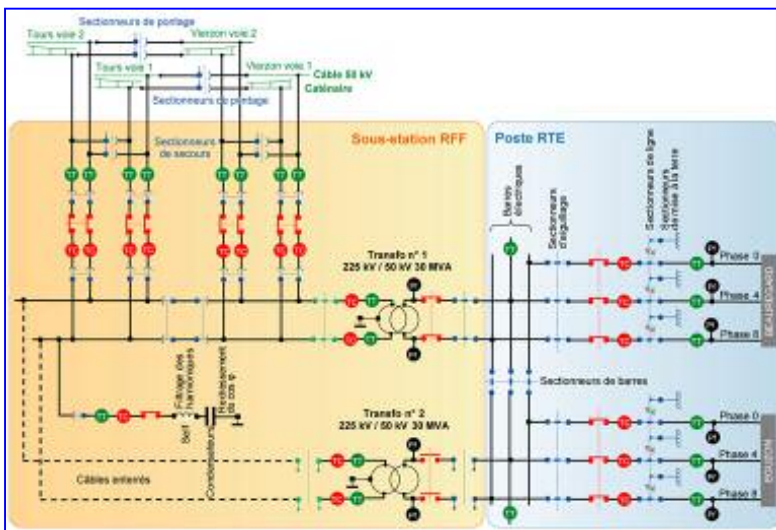
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**ACS controls the power supply of Korean high speed trains between Seoul and Pusan.**



**France – SNCF – 25 kV Sub-station of Tours-Vierzon Line**

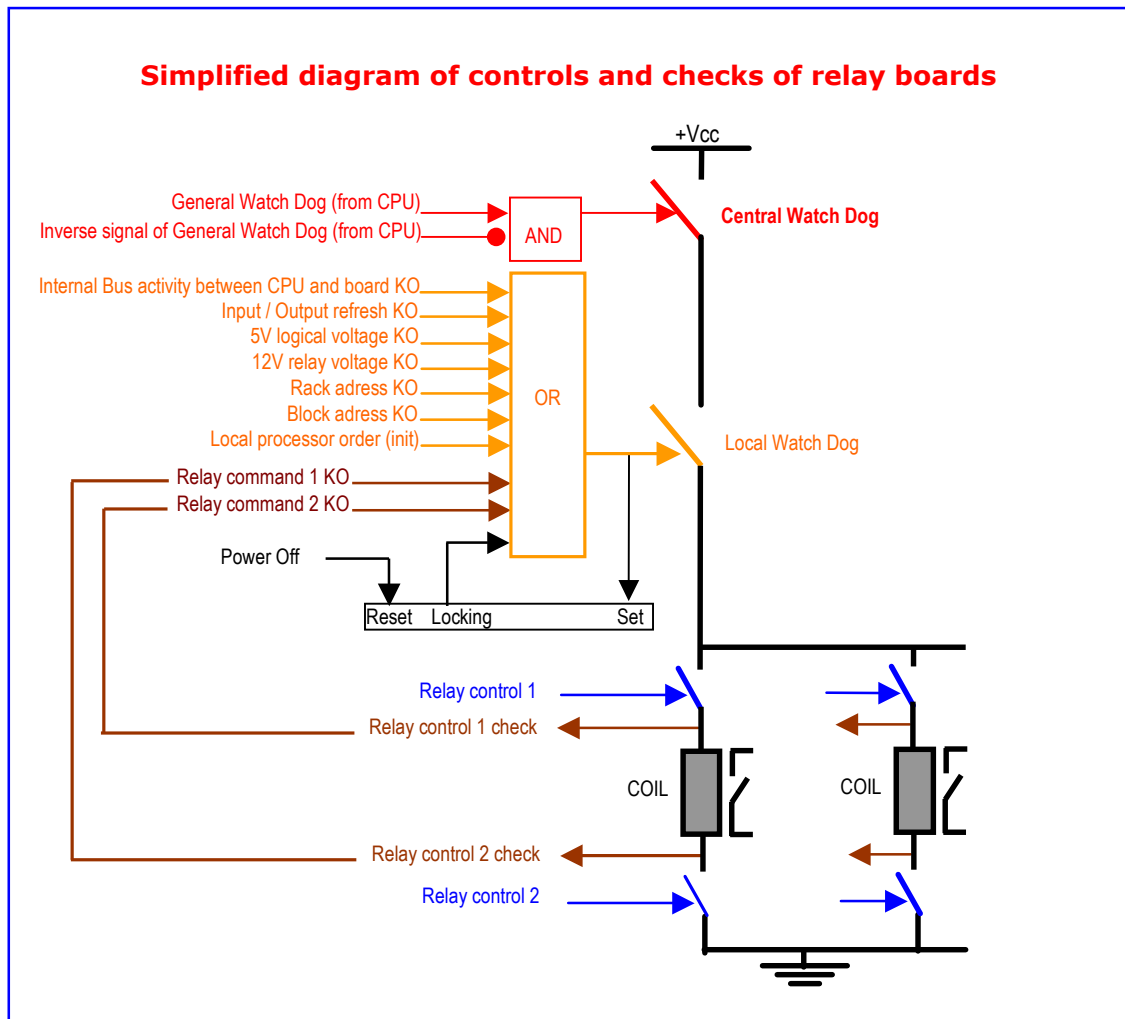


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- Relay Coil is controlled by 4 contacts : control 1, control 2, local WDG and central WDG
- The secured priority is the opening of the relays, so the controls and WDG are in series.
- The central WDG has a redundant and hardware route out of the local microprocessor of the board.
- Local WDG sets off if an electrical or network problem occurs. The surveillance cover is very complete.
- When the Local watch dog happens, it is locked. The power off only can reset it.
- Each coil of relay is driven by two redundant controls. Each control is checked and the checks contribute to the local watch dog.



MATERIAL		SPECIFICATIONS
<b>MECHANICAL</b>	Shell housing Connection Extensions	Electronic boards mounted in 3U 19" Rack Plug-in screw terminal blocks Up to 5 racks = 39 boards + 1 CPU
<b>STURDINESS</b>	Temperatures Operating Humidity Protection Insulation	Operating : -25°C / +70°C      Storage : -40°C / + 85°C 5% to 95% RH non-condensing. Tropicalization on demand. NF EN 60529 IP 20
<b>EMC levels</b>	EN 61000-4-2 Electrostatic discharge immunity EN 61000-4-3 Radiated immunity EN 61000-4-4 Fast transient/burst immunity EN61000-4-6 Conducted immunity	Inputs / Logic : 1500V ; Inputs / Ground : 1500 V CE mark A class 6kV discharges on contact ; 8 kV discharges to air  10V/m ( 80 MHz to 2 GHz. Modulation : 80% AM sine 1 kHz)  2 kV on power slot and I/O slots (direct coupling) 2kV on communication slots (capacitive coupling) 10Vrms Criteria A (150kHz – 80Mhz , modulation 80% AM sine 1kHz)
<b>POWER REQUIREMENTS</b>	Voltage protection against power cut Alarm	48Vcc (20 to 56 Vcc) or 120V (36 to 150Vcc) 20 ms relay (30W) closed if initialization or CPU failure.
<b>CPU</b>	Memories Clock Safety	SDRAM 32 Mo , FLASH 16 Mo (8 Mo for user), FRAM 8 Ko Calendar – real time clock Central Watch dog, Local watch dog on each board, Power management
<b>NETWORKS</b>	Fieldbus protocol Ethernet TCP/IP Serial links Maintenance link	Deterministic FIP : WorldFIP – Fip Device Manager FTP, slave and master Modbus TCP 3 channels RS232 or RS485 with slave and master asynchronous Modbus USB device
<b>DIAGNOSIS</b>		Status register in each board : internal voltages, local watch dog, I/O problem.
<b>REDUNDANT INPUTS</b>	Operating voltage	2 data capture channels per input. Provide the status and its complement at the CPU 24V DC, 48V DC or 120V DC -20% +15% Choice by wiring on the screw terminal 20mA (24V) ; 15 mA (48V) ; 12 mA (120V)
<b>SECURED RELAY DIGITAL OUTPUTS</b>	Digital input current	
	Modularity Security	1 module = 4 * (2 x NO/NC relays + 2 digital inputs ) ► redundancy : Each relay is driven by 2 serial controls ► Opening takes priority L/R = 40ms : 180W (24V) ; 22W (48V) ; 18W (120V)
<b>PROGRAMMING</b>	Switch off power	
	Operating system <b>C language</b> : IDE - Compiler - Debugger	Linux 2.6 Eclipse - GCC - GDB with NFS
<b>IEC61131-3 :</b>	Workbench Languages	Isagraf V5 from ICS Company Ladder Diagram (LD), Structured text (ST), Sequential Function Charts (SFC), List.

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