

# CLEARSY

Safety Solutions Designer

## Safety display DMI SIL2

Programmable generic  
SIL2 platform  
&  
Baseline 3 ETCS DMI

*In partnership with*



# DMI SIL2 display

This DMI is a HMI platform 10.4" which provides SIL2 display, interaction and computation. It is available with an ETCS baseline 3 DMI application on its latest version or as a generic platform for your application. This console is part of a range of consoles that has already sold over 45,000 units since 1997.

## INNOVATIVE SIL2 DMI BASED ON LINUX

It provides SIL2 guarantees against:

- Corruption of the applicative program
- Memory corruption
- Clock drift
- Corruption by a Linux kernel fault
- Wrong information display
- Unwanted touch screen inputs

The guarantees obtained by the certificate are as follows:

- the display of icons and text messages are correct
- the display of complex graphical objects (speedometer and brake level indicators for example) is also correct
- the operator's interactions (human-machine interactions - HMI) with the touchscreen console are secure

These measures reduce the risk that the operator will not see or misinterpret the messages on the screen, and that the commands will not be considered.

## GENERIC SIL2 PLATFORM - FLEXIBLE SIL2 DISPLAY CONTROL – APPLICATION FREE

- Safety (SIL2) is managed by the low layer SW
- Configuration tool to manage the SIL2 constraints (parameter file to be fill)
- Functional Application: delegate SIL2 aspects to a Supervision Module already certified
- Application must be designed to respect exported constraints (detailed in the certificate)
- No mandatory library, you are free to develop your application

## BASELINE 3.6.0 ETCS DMI

Standard 10.4" display



- Customizable to EVC/DMI interfaces
- Easily configurable

The hazards for the ETCS DMI are captured in the mandatory document SUBSET 091 – Safety Requirements for the Technical Interoperability of ETCS in Levels 1 & 2, version 3.4.0, dated 01.12.2015 (section 7.2.1.5) and also in the informative document SUBSET 118 Functional Safety Analysis of ETCS DMI for ETCS Auxiliary Hazard, version 1.4.0, dated 20.06.2016 (section 6.8.1.2). This is also confirmed in an opinion letter by the Railway Agency issued on 28 January 2015, confirming the THR for all hazards and asking for updates of the previous version of those SUBSETs.

The lowest THR value indicated in the tables is  $2 * 10^{-7}$ , which is higher than the minimum requested for SIL 3 (between  $10^{-8}$  and  $10^{-7}$ ).

**So the ETCS DMI includes a number of safety functions with a SIL level up to Level 2.**

## STANDARDS

- Hazardous events: UNISIG Subset 091 3.6.0 "Safety Requirements for the Technical Interoperability of ETCS in Level 1&2".
- ERA specification v 3.6.0 adapted to display STM information (unified or customisable)
- SUBSET 026 v 3.6.0 chapter 4.7 (DMI depending on modes)
- SUBSET 118 v 1.4.0 (informative only)

SPECIFICATIONS	CHARACTERISTICS
Power supply	24-110Vdc / 2200Vdc Insulation
CPU	Cortex A9 iMX6 800MHz, up to Quadcore
Memory	Up to 4GB DDR3; eMMC 8GB
Operating System	LINUX
Application software upload	USB link or Ethernet
Touch screen	Capacitive technology anti-glare "bi-touch" USB Interface
Thermoformed keyboard in front	Without or with 32 keys (UIC612) backlit by LEDs
Ethernet	2 x 10BaseT and 100BaseT Ethernet (IEEE 802.3 - 2002), 1500Vdc Insulation
Insulated serial link	1 x 232/422/485 RS, software-configurable 1500Vdc insulation, maximum speed of 115200bds
Non-insulated serial link (DP)	1 x RS 232, maximum speed of 115200bds
Audio Output	Mono, 10W under 8Ω, 100Hz to 10kHz, S/B > 80db, Distortion < 5 %, protection against short circuits
USB	1 OTG/Host High Speed/Full Speed/Low Speed 1 Host High Speed/Full Speed/Low Speed
Buzzer	Monotonic, 70dB measured at 10cms
Logical inputs	2 non-insulated coding inputs
Earthing	By stud M4
Sealing	Compliant to NF EN 61010-1 standard: - IP 65 Front panel - IP 41 Rear panel
Resolution	VGA or XGA
Display LEDs	3 LEDs (power supply, fault, alarm)
Light sensor	Measure from 3 to 70000lux
Front Panel Impact resistance	Minimum IK06
EMC Environment	Compliant with EN 50155 and EN 50121 railway standards
Climatic Environment	Storage temperature: -50°C to +85°C Operating temperature: -40°C to +70°C TX classification of EN 50155 standard Damp heat: +25°C to +55°C (95% HR) Saline fog: 96H
Standards and Guidelines	Recording the EN 45545 standard. REACH certificate with the (EC) regulation N°1907/2006.
<b>Sustainability</b>	<b>Minimum 10 years availability</b>
<b>Reliability</b>	<b>MTBF 150 000h (IEC 62380) - Life time 15 years</b>
<b>Proven solution</b>	<b>More than DMI installed around the world</b>



## Design examination type certificate

*Certificat de type par examen de la conception*

**N° 9341/0282 edition 1**

Attributed to  
*Délivré à*

**CLEARSY**  
320 Av. Archimède - Pléiades III  
F-13100 AIX-EN-PROVENCE

by  
*par*

**CERTIFER**  
18 Rue Edmond Membrée  
F-59300 VALENCIENNES

Which certifies that the design of the following product:  
*Qui certifie que la conception du produit suivant :*

**SPECIFIC APPLICATION  
ETCS DMI BASELINE 3  
(VERSION 1.7)**

Meets SIL2 requirements of the standards

*Est conforme aux exigences SIL2 des normes*  
CENELEC EN 50126 :2000, EN 50129 :2003, EN 50128 :2011

This certificate includes appendix EC\_9341\_0283 version 1  
*L'annexe EC\_9341\_0283 version 1 fait partie intégrante du présent certificat*

The scope of this certificate is limited to the design of the product referenced in the appendix and its description file.  
*Ce certificat ne s'applique qu'à la conception du produit référencé en annexe et au dossier descriptif en résultant.*

This certification was performed in accordance with CERTIFER standard RF0015 version 3.  
*La présente certification a été conduite en conformité avec le référentiel CERTIFER RF0015 version 3.*

Date of certification: July 28<sup>th</sup>, 2021  
*Date de certification : 18 juin 2021*



Formulaire S130U1/1

Issued at Valenciennes on July 28<sup>th</sup> 2021  
*Délivré à Valenciennes*

The Chief Executive Officer  
*Le Directeur Général*

Pierre KADZIOLA



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Tél : +33 (0)3 27 28 35 00 - Fax : +33 (0)3 27 28 35 09 - www.certifer.eu  
Société Anonyme au capital de 9 000 100,00 € - TVA/SIRET : FR28 802 053 397 00039 - NAF : 7120B - RCS Val



## Design examination type certificate

*Certificat de type par examen de la conception*

**N° 9341/0269 edition 1**

Attributed to  
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21, rue Marcel Pagnol  
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by  
*par*

**CERTIFER**  
18 Rue Edmond Membrée  
F-59300 VALENCIENNES

Which certifies that the design of the following product :  
*Qui certifie que la conception du produit suivant :*

**GENERIC PRODUCT P1  
DMI K-VISION  
(BASELINE 1.7)**

Meets SIL2 requirements of the standards

*Est conforme aux exigences SIL2 des normes*  
CENELEC EN 50126 :2000, EN 50129 :2003, EN 50128 :2011

This certificate includes appendix EC\_9341\_0268 version 1  
*L'annexe EC\_9341\_0268 version 1 fait partie intégrante du présent certificat*

The scope of this certificate is limited to the design of the product referenced in the appendix and its description file.  
*Ce certificat ne s'applique qu'à la conception du produit référencé en annexe et au dossier descriptif en résultant.*

This certification was performed in accordance with CERTIFER repository RF0015 version 3.  
*La présente certification a été conduite en conformité avec le référentiel CERTIFER RF0015 version 3.*

Date of certification: April 27<sup>th</sup>, 2021  
*Date de certification : 27 avril 2021*



Formulaire S130U1/1

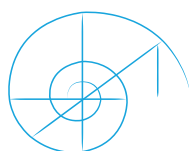
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