

DEUTA

Multifunctional Terminals



IconTrust® - You can Trust.

DEUTA-WERKE 
Technology under Control



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»DEUTA Multifunctional Terminal - The Future of Vision«

The future of longevity lies in the vision ...

Sustainable innovations form the brand essence of our products. The huge experience and creative potential of our employees are the drivers of progress.

DEUTA IPC-based terminals were first used on rail vehicles in 1994. This long-term experience flows into our visionary product ideas.

Terminals from DEUTA are synonymous with a forward-looking generation of displays that are always in touch with the latest trends, yet still remain flexible and economical.

During the development of our MFTs, we make the latest technology available for applications in rail vehicle traffic. SIL-capable terminals with patented IconTrust® technology are the global standard in terms of driving safety for displays which correspond to the safety standards of today and tomorrow.

... with unique vertical integration

Product development is therefore reliably supported by our accredited test laboratory. The state-of-the-art laboratory fulfils the highest technical standards and offers a wide range of testing options, such as electro-magnetic compatibility and climatic and mechanical influences, for instance.

As a supplier of operating and display devices with long-term delivery commitments, DEUTA has been manufacturing circuit boards at the company's in-house production facility at its main site since the mid-1990s. From PCB layout to logistics, all milestones are part of our certified ISO 9000:2015 and IRIS processes.

... optically bonded

New terminal ranges from DEUTA are optically bonded as standard. This additional finishing process optimises image quality and reading angle by increasing the contrast and minimising reflections.

... and Safety-Level

DEUTA offers the Multifunctional-Terminals optional with the safety technologies IconTrust® for the safe data display up to SIL2 and SelectTrust® for the safe data entry up to SIL2.



»IconTrust® & SelectTrust® -

The worldwide leading solution for SIL terminals!«

IconTrust® & SelectTrust®

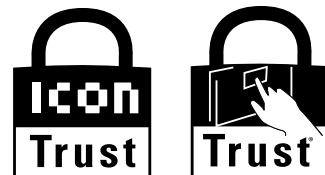
Within the scope of Baseline 3 and its safety requirements for technical interoperability, main focus is on the mandatory specification of the Driver Machine Interface (DMI) as SIL component.

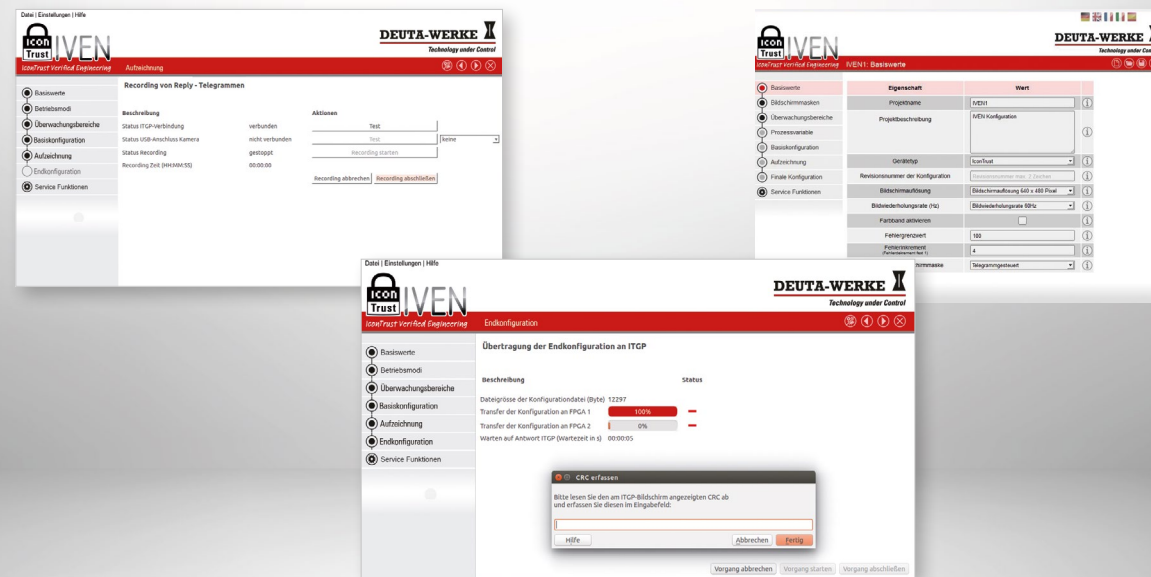
The monitoring of valid display and input areas on a touch panel as required in Subset-091 is monitored with IconTrust® and SelectTrust® on DEUTA Multi-Functional Terminals. These safety functions detect representation errors of the unsafe PC system and differentiate between valid and invalid input areas on the TFT.

The SelectTrust® function checks the activation or release of the touch area as well as the single or permanent transmission of the activation. Our technology thus complies with the requirements of Subset-091 with a safe, flexible and cost-efficient solution.

IconTrust® & SelectTrust®

- Proved safety technology in many worldwide projects
- Can be implemented and demonstrated up to SIL 3 and completely appraised upon request
- Monitoring unit independent from PC with long service life
- Can be easily retrofitted as add-on in every terminal



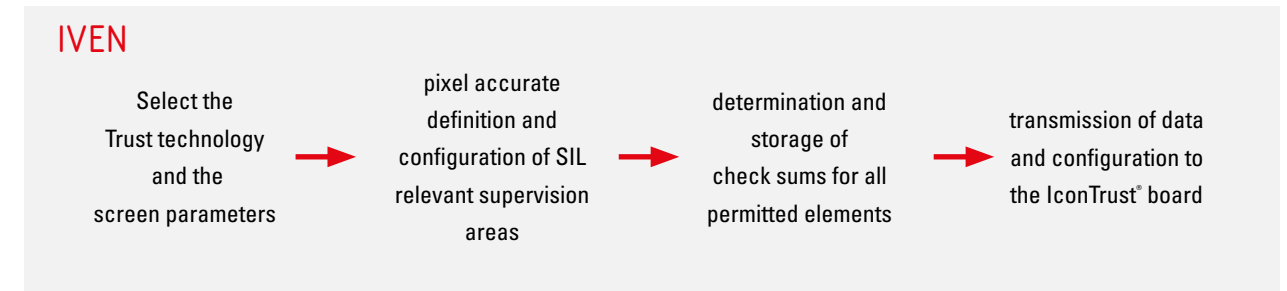
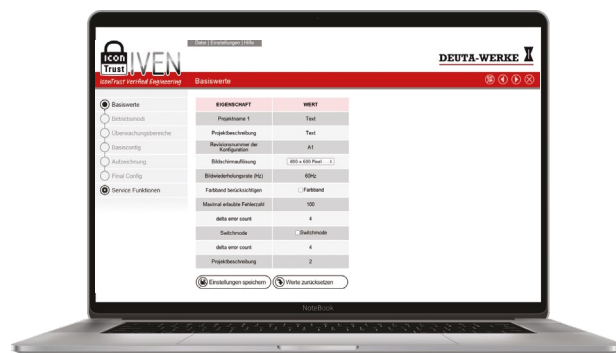


»IVEN -

Makes SIL configuration of terminals easy!«

Application changes and project-specific adaptations can be easily implemented with the universal IVEN configuration tool. Safety-relevant changes of the supervised areas or adaptations to new display parameters can be configured project-specifically with the engineering tool IVEN and prepared for assessment.

IVEN does not only check the configuration for consistency but provides also a preview of the configured supervised areas. In doing so, IVEN records all process values with a corresponding screen shot, transmits the configuration to the IconTrust® module and automatically generates a PDF-validation report as documentation for the assessment.



IconTrust® – for safe display

IconTrust® monitors predefined areas on the TFT display and differentiates between valid and invalid information. IconTrust® uses a safe computer to transmit the data to the panel PC, where they are processed and displayed. IconTrust® monitors the represented screen areas on the TFT display and transmits the confirmation back to the safe computer. The comparison occurs in the safe computer, e.g. in the EVC (European Vital Computer).

SelectTrust® – for safe touch input

SelectTrust® is the first certified technology worldwide to demonstrably enable safe manual input of information via touch screen or a softkey.

The entry and visualisation at this position are checked in the functional safe SelectTrust® solution.

In case of total correctness, a functionally safe entry action will be transmitted to a safe computer.



Independent and cost-effective solutions

Along with IconTrust®, SelectTrust® provides a cost-effective solution for safety consideration respectively for the proof of compliance with current safety requirements. Both monitoring systems work fully decoupled from the display- and operating function making them unique in their mode of operation.



Product Overview



D-SmartView®

High quality and sophisticated

- 12.1"
- Quadcore INTEL® processor ATOM, 4x 1,6 GHz
- PROFINET CC-B/PROFIsafe
- Standard VESA mount



D-EcoView®

High performance with low power consumption

- 8", 10.4", 12.1"
- IMX8X Quadcore ARM64 A35, 1.2GHz
- IconTrust® & SelectTrust®



D-PowerView®

Maximum power

- 10.4", 12.1", 15.6"
- Intel Atom x64 13E 1.5 GHz Quad Core
- IconTrust® & SelectTrust®



Wide-Terminals

More Space for your Information

- 12.1" Wide
- D-EcoView®: IMX8X Quad Core ARM64 A35, 1.2GHz
- D-PowerView®: Intel Atom x64 13E 1.5 GHz Quad Core
- IconTrust® & SelectTrust®



MFTR

Redundant display solutions

- Two redundant 8" colour terminals
- 10.4" total surface
- IMX8X Quad Core ARM64 A35, 1.2GHzr
- Optimised for ETCS and LZBB



Head-Up Display

Redundant display solutions

- Important travel data at a glance
- One generic HUD platform for all railway projects
- HUD & IconTrust® = SIL2



»D-SmartView® -
As Elegant as a Consumer Tablet with PROFINET & PROFIsafe«

D-SmartView®
In modern rail vehicles, the driver's cab terminal is not only a control instrument in the driver's line of vision, but also a visual component in the overall impression of the vehicle. The D-SmartView® terminal underlines the modernity of the vehicles with its very flat design, narrow rounded display edges and a brilliant optically-bonded surface.

The D-SmartView® terminal will not longer be embedded inside the surface of the driver's desk, as it is designed to be mounted on a Vesa monitor system. Depending on the seating position and size of the drivers, the height of the terminal can be positioned variably.

- 
- PROFINET**
The unit is equipped with PROFINET:
- Compact field unit
 - CC-B support
 - Dual port
 - PNIO_version: V2.43
 - Status LED for „DCP signal“

- PROFIsafe (only MFTS204)**
- PROFIsafe Version: V2.4 and V2.6
 - Adress Type 2
 - Without iPar-Server support



D-SmartView®



Display backlight	LED backlight
Dimmable lighting	0 to 800 cd/m2
Status LEDs	3
CPU/clock frequency	Quadcore INTEL® ATOM processor®, 4x 1.6 GHz
RAM memory	8 GB
Graphics	INTEL® HD Graphics 500
Bulk memory	up to 64 GB
Additional controller	Environment Controller
Buzzer	yes
Temperature management	yes
Ambient light sensor	front side
Voltage	prepared for external 24 VDC power supply unit compliant with railway standard
Power consumption	typ. 25 W
Display type/size	Colour TFT / 12.1"
Display resolution, colour depth	1024 x 768 bit
Read angle	±85° in horiz. (left -, right +) and vert. (lower -, upper +) direction
Ethernet	1x 10/100 Base T as M12 d-coded ¹⁾ 2x PROFINET plug connector
PROFINET	2x CC-B, dual port, M12 D-coded PNIO_version: V2.34, status LED for "DCP signal"
Audio out	Class-D stereo audio amplifier min. 5 W at 8 Ohm
USB interfaces	2 x USB2.0 (M8 a-coded ¹⁾)
Vehicle bus	1x Ethernet, 1x PROFINET, on request: CAN, MVB, RS422, RS485
Device coding	4 codings possible
Touch screen	capacitive, optically bonded
Front dimension (W x H)	318 mm x 234 mm
Weight	approx. 3.6 kg
Protection category front/rear	IP42 (resistant to dusts and water sprays)
Operating temperature	full functionality: -25°C to +55 °C
Safe Supervision Function (optionally)	with IconTrust® up to SIL2 with SelectTrust® up to SIL2
Operating system	LINUX
Applications	variable, depends on area of application
Mounting	prepared for the VESA 75 Standard
Standard	EN 45545, EN 50155, EN 50121-3-2, EN55011, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6

¹⁾Available as accessories from DEUTA: Connector for 5-pole power supply, Scha151 redundancy switch, USB service cable - M8 to standard USB adapter, cable length 1 m, Ethernet service cable - M12 to RJ45 adapter cable, cable length 0.5 m, when used as redundant dual display: Vehicle bus connector cable DSUB9 4/40 UNC, ETH/ETC M12/M1





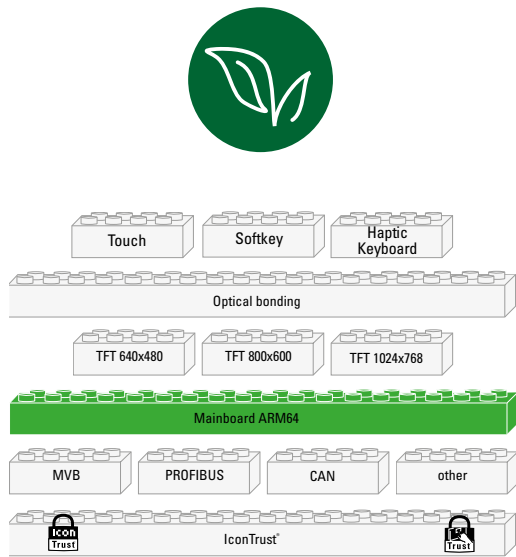
»D-EcoView®/D-EcoView® R Trust - Sustainability in Focus«

D-EcoView®
High performance, low power consumption and long-term availability are the three goals we have combined to make the D-EcoView®.

The IMX8X quad core A35 processor with 64 bit is synonymous with high performance, long-term availability but with a 30% lower power consumption in comparance with Intel ATOM or AMD Fusion and ground-breaking security features.

The D-EcoView® is designed as modular system. Inside the D-EcoView®, the ARM mainboard forms the basis for a wide range of terminal variants. The position of the interfaces remains the same on every terminals size.

D-EcoView® Trust
The D-EcoView® Trust Terminals are optionally available with the safety functions IconTrust® and SelectTrust®.



D-EcoView®

Display type	Colour TFT 8" / 10.4" / 12.1"
Display resolution	480 x 800 / 1024 x 768/ up to full HD
Display backlight	LED backlight
Dimmable lighting	0 to 1,000 cd/m²
Status LEDs	4 LEDs
Ambient light sensor	front side
Input unit	capacitive touch
CPU/clock frequency	IMX8X Quad Core ARM64 A35, 1.2GHz
RAM memory	3 GB RAM DDR4
Flash memory	64 GB SD card
Extensibility	upon request
Additional controller	Environment Controller
Voltage range	24 VDC to 110 VDC (± 30%)
Ethernet interfaces	2x 10/100 BaseT (M12 d-coded) ¹⁾
USB interfaces	2 x USB2.0 (M8 a-coded) ¹⁾
Vehicle bus I/O	RS 422/485, MVB, CAN, RS232, PROFIBUS
Device coding	4
Audio out	1 x 10 W, 8 Ohm, amplifier
Weight	approx. 3 kg
Protection category front/rear	IP65 / IP30
Temperature range operation	-25 °C to +70 °C classification
Temperature range for storage	-40 °C to +85 °C
Safe Supervision Function (optional)	with IconTrust® up to SIL2 with SelectTrust® up to SIL2
Operating system	LINUX
Project software	DEUTA (QDMI) or customer specific
Application software	In accordance with ETCS Baseline 3 and national train protection requirements
EN standards	EN45545-2 2013, EN50016, EN50155, EN50121, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61373
CE	yes

¹⁾ Available as accessories from DEUTA: Connector for 7-pole power supply, Scha151 redundancy switch, USB service cable - M8 to standard USB adapter, cable length 1 m, Ethernet service cable - M12 to RJ45 adapter cable, cable length 0.5 m, when used as redundant dual display: Vehicle bus connector cable DSUB9 4/40 UNC, ETH/ETC M12/M1



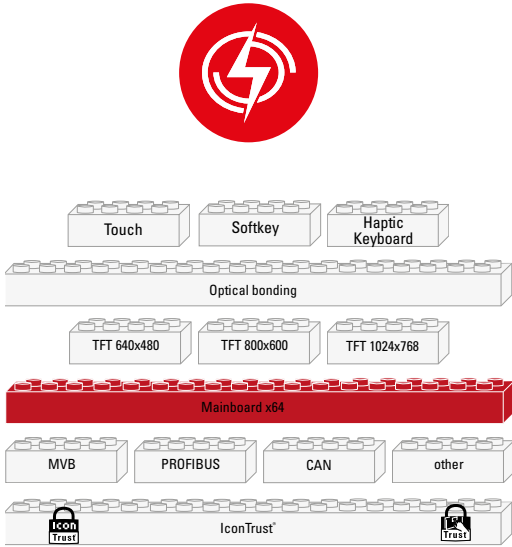


»D-PowerView® - High Performance Displays«

D-PowerView®
In the D-PowerView®, the x64Intel Elkhart Lake delivers the performance required for demanding applications. Its 8 GB RAM memory capacity delivers sufficient future-proofing.

The D-PowerView® is designed as modular system. Inside the D-PowerView®, the x64 mainboard forms the basis for a wide range of terminal variants. The position of the interfaces remains the same on every terminals size.

D-PowerView® Trust
The D-PowerView® Trust Terminals are optionally available with the security functions IconTrust® and SelectTrust®.



D-PowerView®

Display type	Colour TFT 10.4" / 12.1" / 15"
Display resolution	480 x 800 / 1024 x 768/ up to full HD
Display backlight	LED backlight
Dimmable lighting	0 to 1,000 cd/m²
Status LEDs	4 LEDs
Ambient light sensor	front side
Input unit	capacitive touch
CPU/clock frequency	Intel Atom x6413E series 1.5 GHz Quad Core
RAM memory	8 GB RAM DDR4
Flash memory	64 GB SD card
Extensibility	upon request
Additional controller	Environment Controller
Buzzer	70 dB measured at 50 cm
Voltage range	24 VDC to 110 VDC (± 30%)
Power consumption	< 20 W
Ethernet interfaces	2x 10/100 BaseT (M12 d-coded) ¹⁾
USB interfaces	2 x USB2.0 (M8 a-coded) ¹⁾
Vehicle bus I/O	RS 422/485, MVB, CAN, RS232, PROFIBUS
Device coding	4
Audio out	1 x 10 W, 8 Ohm, amplifier
Weight	approx. 3 kg
Protection category front/rear	IP65 / IP30
Temperature range operation	-25 °C to +70 °C classification
Temperature range storage	-40 °C to + 85 °C
Safe Supervision Function (optional)	with IconTrust® up to SIL2 with SelectTrust® up to SIL2
Operating system	LINUX
Project software	DEUTA (QDMI) or customer specific
Application software	In accordance with ETCS Baseline 3 and national train protection requirements
EN standards	EN45545-2 2013, EN50016, EN50155, EN50121, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61373
CE	yes

¹⁾ Available as accessories from DEUTA: Connector for 7-pole power supply, Schaf151 redundancy switch, USB service cable - M8 to standard USB adapter, cable length 1 m, Ethernet service cable - M12 to RJ45 adapter cable, cable length 0.5 m, when used as redundant dual display: Vehicle bus connector cable DSUB9 4/40 UNC, ETH/ETC M12/M1



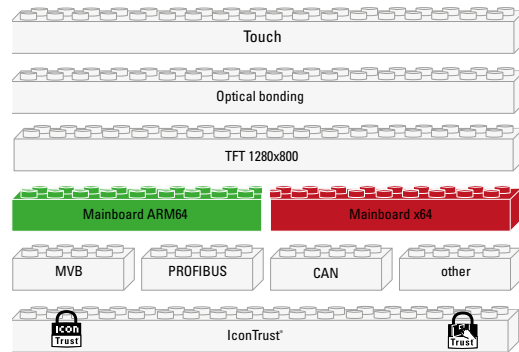


»DEUTA 12.1 Wide Terminals - Everything at a glance!«

More Space for your Information

DEUTA Wide Terminals feature the compact installation dimensions of a 10" housing combined with a 12.1" display. The optically bonded surface offers space to display travel and vehicle data in parallel. The Wide Terminals are optionally available with the IconTrust® and SelectTrust® safety functions to ensure secure display and input.

Depending on your requirements, the high-performance Intel Quad Core Elkhart Lake x64 or the sustainable IMX8X Quad Core A35 64-bit processors are available.



- 12,1" Wide Terminal available as:
- D-EcoView®: IMX8X Quad Core ARM64 A35, 1.2GHz
 - D-PowerView®: Intel Atom x64 13E 1.5 GHz Quad Core

DEUTA Wide Terminals - 12.1"

Display type	Colour TFT 12.1" Wide
Display resolution	1280 x 800
Display backlight	LED backlight
Dimmable lighting	0 to 1,000 cd/m²
Status LEDs	4 LEDs
Ambient light sensor	front side
Input unit	capacitive touch
CPU/clock frequency	D-EcoView®: IMX8X Quad Core ARM64 A35, 1.2GHz D-PowerView®: Intel Atom x64 13E 1.5 GHz Quad Core
RAM memory	D-EcoView®: 3 GB RAM DDR4 D-PowerView®: 8 GB RAM DDR4
Flash memory	64 GB SD card
Extensibility	upon request
Additional controller	Environment Controller
Voltage range	24 VDC to 110 VDC (± 30%)
Ethernet interfaces	2x 10/100 BaseT (M12 d-coded) ¹⁾
USB interfaces	2 x USB2.0 (M8 a-coded) ¹⁾
Vehicle bus I/O	RS 422/485, MVB, CAN, PROFIBUS
Device coding	4
Audio out	1 x 10 W, 8 Ohm, amplifier
Cut-out	282 mm x 206 mm
Weight	approx. 3 kg
Protection category front/rear	IP65 / IP30
Temperature range operation	-25 °C to +70 °C OT3 classification
Temperature range for storage	-40 °C to +85 °C
Safe Supervision Function (optional)	with IconTrust® up to SIL2 with SelectTrust® up to SIL2
Operating system	LINUX
Project software	DEUTA (QDMI) or customer specific
Application software	In accordance with ETCS Baseline 3 and national train protection requirements
EN standards	EN45545-2 2013, EN50016, EN50155, EN50121, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61373
CE	yes

¹⁾ Available as accessories from DEUTA: Connector for 7-pole power supply, Schaf151 redundancy switch, USB service cable - M8 to standard USB adapter, cable length 1 m, Ethernet service cable - M12 to RJ45 adapter cable, cable length 0.5 m, when used as redundant dual display: Vehicle bus connector cable DSUB9 4/40 UNC, ETH/ETC M12/M1



D-EcoView®



D-PowerView®





»DEUTA MFTR - Redundant display solutions!«

MFTR8/2

Two redundant full-valued 8" vertical terminals with a total surface of 10.4" optimise the display availability of the MFTR8/2.

Each of the two displays are full-valued, individually replaceable function modules, thus satisfying the requirement towards minimised life-cycle costs. The train driver can manually switch between the terminals. For train protection applications such as ETCS, LZB, and of course any customer application.

MFTRS1080

Would you like to replace your 10" driver's cab terminal with a redundant terminal equipped with IconTrust®? DEUTA proves that two redundant terminals fit into the MFTRS1080. This way, you simply replace a 10" terminal with a redundant terminal concept and without any modifications to the driver's console.

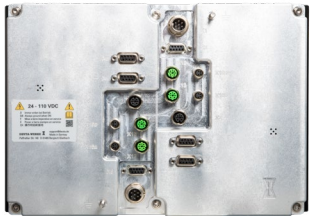
DEUTA MFTR

- Two redundant 8" colour terminals
- 10.4" total surface
- IMX8X Quad Core ARM64 A35, 1.2GHz
- optimised for ETCS and LZB

DEUTA MFTRS3080

Display type	Colour TFT 8" / 10.4" / 12.1"
Display resolution	480 x 800 / 1024 x 768/ up to full HD
Display backlight	LED backlight
Dimmable lighting	0 to 1,000 cd/m²
Status LEDs	4 LEDs
Ambient light sensor	front side
Input unit	capacitive touch
CPU/clock frequency	IMX8X Quad Core ARM64 A35, 1.2GHz
RAM memory	3 GB RAM DDR4
Flash memory	64 GB SD card
Extensibility	upon request
Additional controller	Environment Controller
Voltage range	24 VDC to 110 VDC (± 30%)
Ethernet interfaces	2x 10/100 BaseT (M12 d-coded) ¹⁾
USB interfaces	2 x USB2.0 (M8 a-coded) ¹⁾
Vehicle bus I/O	RS 422/485, MVB, CAN, RS232, PROFIBUS
Device coding	4
Audio out	1 x 10 W, 8 Ohm, amplifier
Weight	approx. 3 kg
Protection category front/rear	IP65 / IP30
Temperature range operation	-25 °C to +70 °C classification
Temperature range for storage	-40 °C to +85 °C
Safe Supervision Function (optional)	with IconTrust® up to SIL2 with SelectTrust® up to SIL2
Operating system	LINUX
Project software	DEUTA (QDMI) or customer specific
Application software	In accordance with ETCS Baseline 3 and national train protection requirements
EN standards	EN45545-2 2013, EN50016, EN50155, EN50121, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61373
CE	yes

¹⁾ Available as accessories from DEUTA: Connector for 7-pole power supply, Scha151 redundancy switch, USB service cable - M8 to standard USB adapter, cable length 1 m, Ethernet service cable - M12 to RJ45 adapter cable, cable length 0.5 m, when used as redundant dual display: Vehicle bus connector cable DSUB9 4/40 UNC, ETH/ETC M12/M1



D-EcoView® R Trust

»DEUTA Head-Up-Display - With IconTrust® DMI Safety«

Important travel data at a glance

Head-Up-Displays are state-of-the-art-technology in automotive and aviation. DEUTA developed a Head-Up-Display solution for railway vehicles, presenting forward travel information from the driver machine instruments onto a combiner display in front of the vehicle windshield upgraded with IconTrust® safety up to SIL2.

One generic HUD platform for all railway projects

Finding the best Head-Up-Display position - even in narrow installation spaces is a complex challenge in new and refurbishment railway vehicle projects. DEUTA designed a generic HUD platform, combining flexible installation options, advanced safety and more operating and driving comfort in a compact space-saving design. The Head-Up-Display architecture fits even in narrow drivers desks.

Improvement of safety

The most important information are mirrored parallel at the Head-Up-Display combiner surface. The driver keeps continuously the visual axis between the Head-Up-Display and the track. The Multifunctional Terminal communicates via the vehicle computer and generates the information for the Head-Up-Display without changing the vehicle architecture.

HUD & IconTrust® = SIL2

In combination with an IconTrust® Multifunctional Terminal the DEUTA Head-Up-Display can reach a safety level up to SIL2. IconTrust® monitors dedicated areas on the TFT panel and differentiates between safety related and non-safety related information.

Each of the individual areas of the displayed image are analysed and compared to the value of the respective input variable during every image refresh cycle in IconTrust®.





»DEUTA Head-Up-Displays -

All safety information at a glance!«

The most relevant information:

- Warning notices
- Navigation instructions
- Speed
- Signal lamps



With highest quality:

- Robust aluminium housing
- High contrast
- Large virtual image size
- Compact dimensions
- Great colour scale

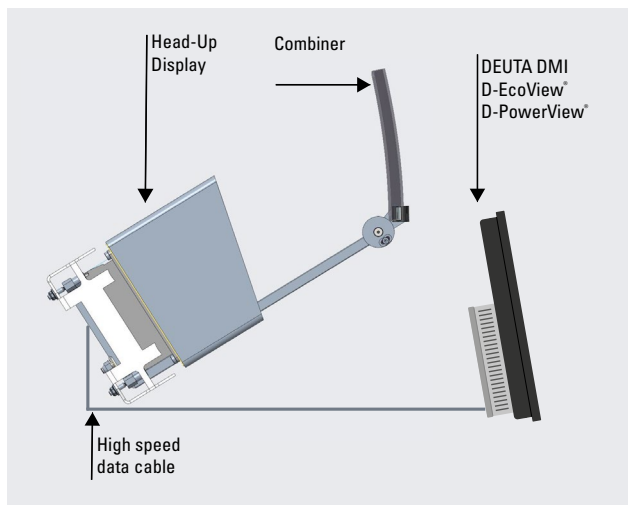


Head-Up-Display & DMI

HUD type	Combiner
Brightness	>15,000 cd/m ²
Contrast	1700:1
Resolution	800 x 480
Vehicle bus	MVB, Profibus, CAN, Ethernet
Power Supply	Wide range, 24 - 100 VDC
Safe Supervision Function (opt.)	In combination with IconTrust® DMI up to SIL2

DMI type	D-PowerView®
CPU/clock frequency	Intel Atom x64XX series 1.5 GHz Quad Core
Display type	Colour TFT 10.4" / 12.1" / 15"
Safe Supervision Function (opt.)	With IconTrust® up to SIL2

DMI type	D-EcoView®
CPU/clock frequency	IMX8X Quadcore ARM A35, 1.2GHz
Display type	Colour TFT 8" / 10.4" / 12.1"
Safe Supervision Function (opt.)	With IconTrust® up to SIL2



- Generic HUD platform
- Projection on a transparent combiner in front of the windshield
- Independent of the angle and geometry of the windshield
- The view angle of the driver keeps unchanged

DEUTA-WERKE

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DEUTA – The Home of Trust-Technology:



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SignalTrust®



MouseTrust®



SelectTrust®



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