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SIL 2 & SIL 3 certified
4.000
 sold
IconTrust®
 Terminals
 worldwide

DEUTA - The Home of Trust-Technologie:



IconTrust®



SignalTrust®



TouchTrust®




SelectTrust®



DEUTA Multi-Functional Terminals



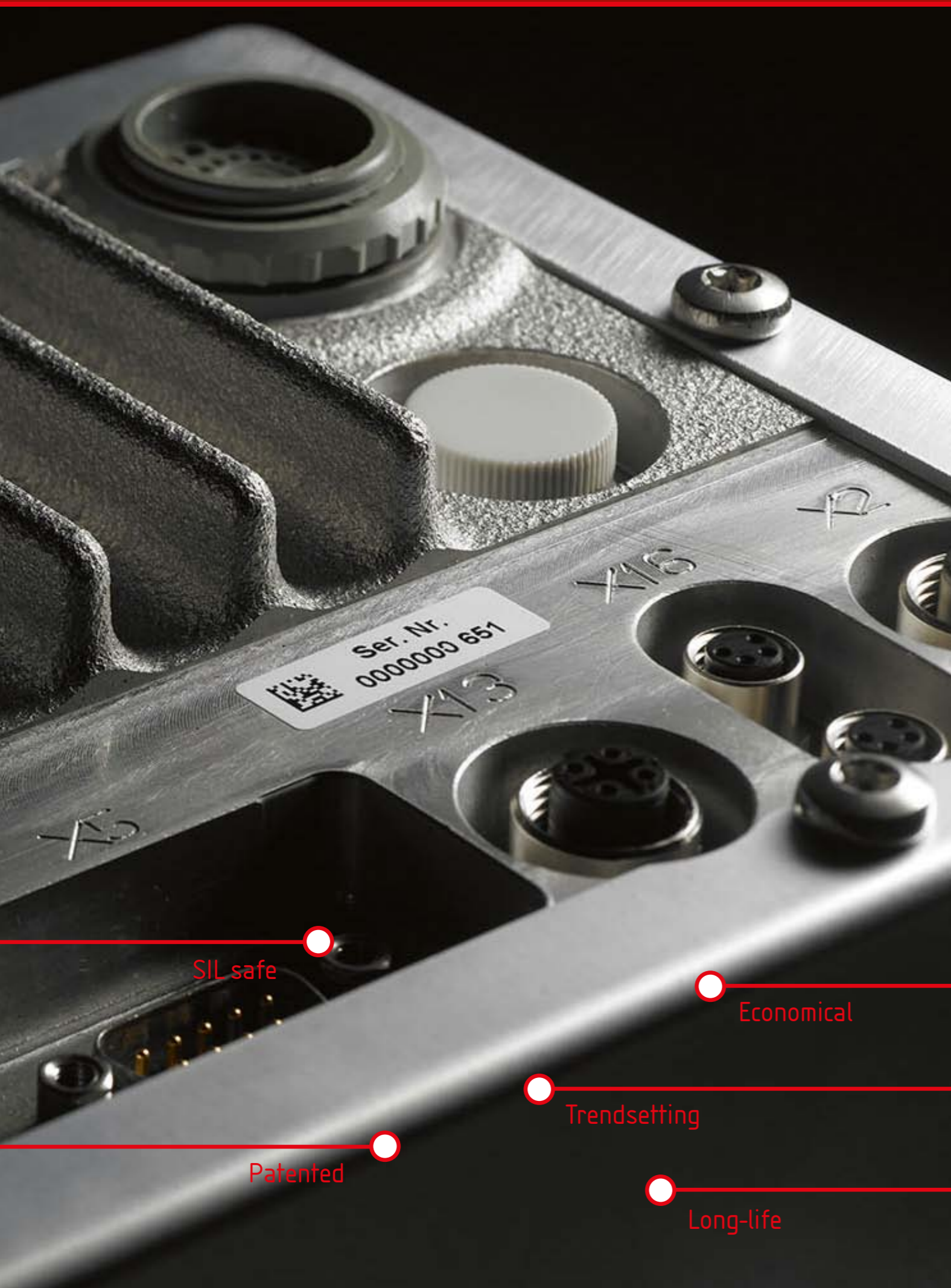
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IconTrust® - You can Trust.



SIL safe

Economical

Trendsetting

Patented

Long-life

» DEUTA Multi-Functional Terminals - You can depend on it!

Today and tomorrow«

Patented for sure!

DEUTA Multi-Functional Terminals stand for a forward-looking display generation always in touch with the latest trends yet is also flexible and economical.

When we develop our MFTs, we exploit the latest in technology for applications in rail vehicle traffic. SIL-capable Multi-Functional Terminals with patented IconTrust® technology are the new standards in terms of driving safety for displays which correspond to the safety standards of today and tomorrow.

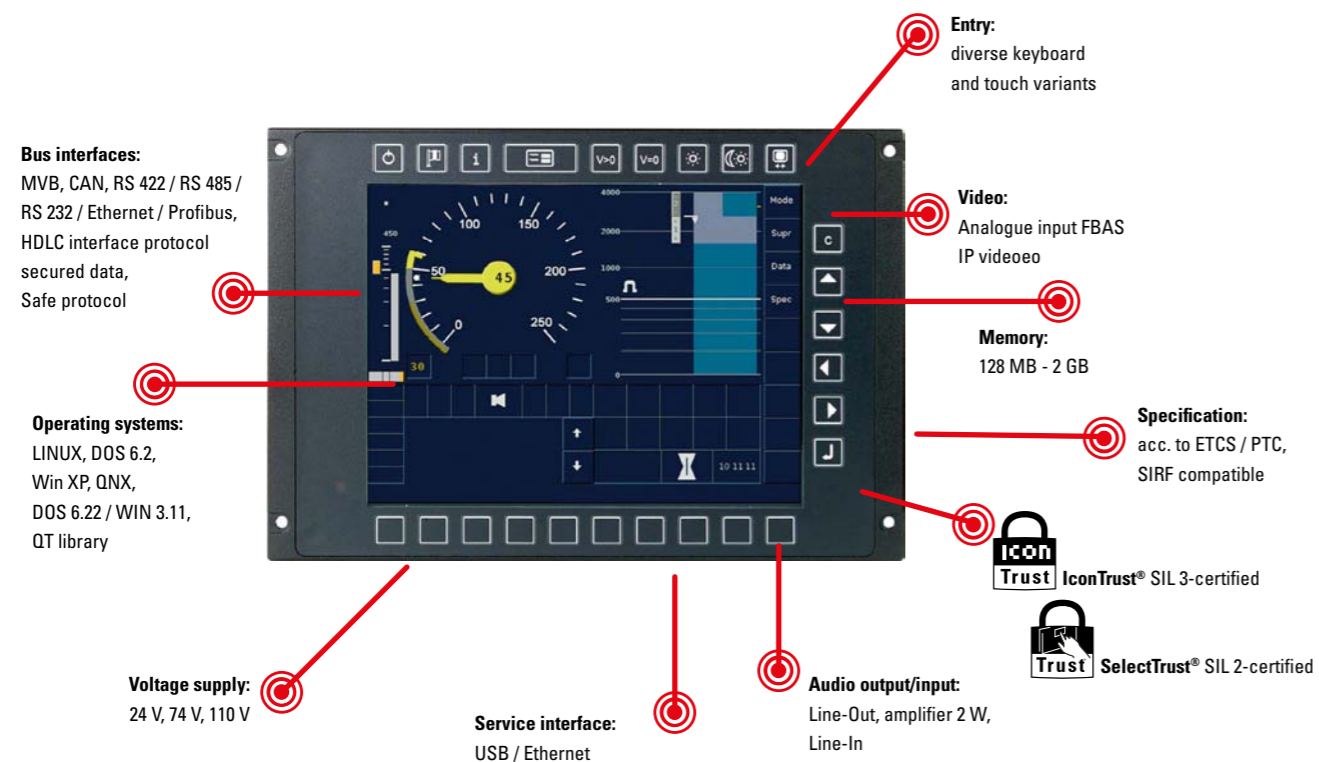
Tailor-made!



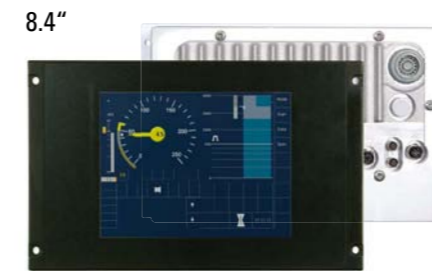
»DEUTA MFT Highlights -

Innovative safety technology from one source!«

- **Safe:** SIL 3-capable display solutions thanks to patented IconTrust® technology
- **Economical:** Minimised life-cycle costs and form-fit-function compatibility
- **Rugged:** Regarding extreme environmental conditions
- **High:** The MTBF values of the displays



20 years of trendsetting technology



- **Everything from one source**
Advice, development, layout and selection of components, board assembly, qualification, testing, production and support: DEUTA controls the entire process chain of display development
- **Platform concept**
One platform, many possibilities for individualisation. With just a few components and plug connections, we have displays compatible in terms of installation and function available at any time.
- **Safety technology**
DEUTA MFTs offer SIL-capable display solutions thanks to the patented IconTrust® technology. That is what makes DEUTA the leader in safety technology for display applications.

- **Longevity**
The long-term availability of the components and their reliability have top priority. This sustainable strategy guarantees displays that will work for decades and long-term security of investment with high MTBF values and minimised life-cycle costs.
- **Obsolescence management**
Follow-up concepts are already considered during the design phase. This ensures the availability of the MFTs across the entire life cycle. New displays are compatible to the predecessors in form, fit and function.

»DEUTA IconTrust® & SelectTrust® -

The worldwide leading solution for ETCS !«

- Proved safety technology for 10 years in many 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

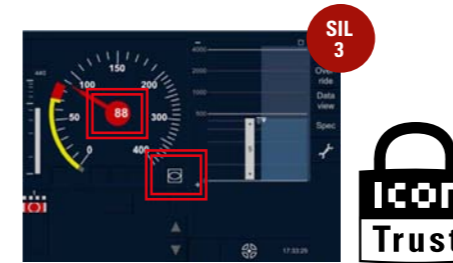


Simple, secure, flexible

IconTrust® & SelectTrust®

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® - 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.



»IVEN - makes SIL configuration of terminals easy«



The DEUTA Engineering Tool IVEN offers to our customers the simple project-specific configuration of safety-critical supervision areas on Multi-Functional Terminals

- » Upload of safety-related comparison parameters
- » Documentation of IconTrust configuration
- » Validation report of IconTrust configuration
- » Documentation for assessor

»DEUTA Terminal Applications – ergonomic, standard-compliant & safe«

- **Worldwide:** In many train protection systems
- **Ergonomic:** Support for Usability Engineering and UX Design
- **Flexible:** For all DEUTA Multi-Functional Terminals and operating systems
- **Compliant with standards:** For safety applications in accordance with EN 61508 / 5012x, among others

The perfect software application begins with an in-depth understanding of the domain requirements within the system environment. As the supplier for sensors, travel data recorders and Multi-Functional Terminals, DEUTA has more than 110 years of knowledge in speed processing and speed displaying.

Our employees check the hardware and software requirements in close coordination with the customer. The experienced software engineers use modern tools and methods to produce marketable application software for train protection systems. Depending on the project, our design engineers and hardware developers create a vehicle-specific retrofit solution or a new product – up to the generic product platform.



Retrofit ICE 3:
DEUTA Terminal Application for ETCS – SIL 2 / SIL 3
Hardware concept with two DEUTA ARM terminals
in one housing for Baseline 3.



DEUTA Terminal Application for PZB
Hardware concept with two DEUTA
ARM terminals



DEUTA Terminal Application
for SCMT, Italy



Usability Engineering for best User Experience

The comprehensibility and ergonomics of the terminal application is decisive for the safety of the train driver and his passengers.

Our software developers not only develop specification-compliant software interfaces based on international standards, but they also regard the terminal applications as a man-machine interface from the perspective of the train driver. Usability Engineering and User Experience form specific customer applications beyond the standardised applications: From very legible type fonts to easily understandable Graphic User Interfaces, the ergonomic layout of the user interfaces facilitates the work of the train drivers.



DEUTA Terminal-
Application for I60R



Definition of Done

We are only then satisfied when our customers are satisfied. That is why we prepare a list of criteria as part of our agile software development before the start of the project.



Customer-oriented sprint planning ...

Regular sprint planning provides our customers with a preview of upcoming interactions at short intervals. This creates room for actively prioritised project planning.



... in Bergisch Gladbach and Berlin

By expanding our software development capacities in the Berlin Technical Office, we are now even closer to our customers.



Safe screen areas for SIL
applications with IconTrust®
and SelectTrust®



SIL safe

Our DEUTA Safety Managers understand the safety-critical applications, are familiar with the specifications and know how to implement them in order to achieve the required Safety Level. The basis for software applications with the DEUTA Safety Level are the patented Trust technologies. IconTrust® ensures safe display up to SIL 3 and SelectTrust® for safe entry up to SIL 2.



Configuration of the monitoring areas
with IVEN

Subsequent application changes outside the safety-related monitoring areas have no influence on the expertise. Our customers are welcome to configure their own project-specific safety-related changes and reconfiguration of the monitoring areas with the IVEN Engineering Tool and prepare for the expertise.

»DEUTA MFT111 -

High Performance in the driver's cab!«

- 10.4" colour TFT with at least 640 x 480, 18 bit, LED light
- AMD Fusion Dual-Core 1 GHz processor
- Resistive, scratch-proof touch screen or short-stroke keyboard
- Protection category: IP 65 front / IP 54 rear



Innovative leap in the MFT world

The MFT111 is an innovative leap in the MFT world. As a high-performance MFT in the area of driver's cab terminals, DEUTA' MFT 111 consistently maintains its high requirements as technology leader in the market. The dual core processor is eminently suited for high-performance applications, .e. g., IP video applications.

Also applicable to the DEUTA MFT111: few components, few plug-type connectors, everything on one pc board and minor power losses. DEUTA thus ensures that each individual application is quickly and reliably ready for use and even exceeds the record-breaking MTBF values of the field data.

The compact housing of the MFT111 also fits into tight installation conditions. When equipped with the optionally available IconTrust, the MFT111 is converted into the SIL terminal MFTS111 with a maximum of certified evaluated safety.



MFT111, key

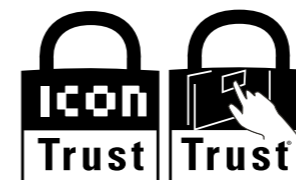


MFT111, touch



MFT111arctic

Feature/Specification	MFT111
Display lighting	LED backlight
Dimmable lighting	0 to 1,000 cd/m ²
Status LEDs	3 LEDs
CPU/clock frequency	AMD Fusion, Dual-Core processor, 1 GHz
RAM memory	1 GB
Flash-EPROM	1 MB
Video memory	4 MB
Flash memory	min. 2 GB
Extensibility	upon request
PC keyboard connection	USB keyboard
Additional controller	Environment Controller
Buzzer	yes
Temperature management	yes
Ambient light sensor	front side
Power supply	24 - 110 V (DC ± 30%) (wideband)
Power consumption	typ. 30 W
Display type/size	Colour TFT/10.4" (26.4 cm) or upon request
Display resolution, colour intensity	640 x 480, 18 bit 800 x 600 or 1024 x 768
Ethernet	2x 10/100 BaseT as (M12 d-coded ¹⁾)
Video	up to 4 cameras
Audio out	2x Line-Out or 2x2 W loudspeakers
USB	2x USB 2.0 (M8 a-coded ¹⁾) + 1x Feature Connector
Vehicle bus, I/O	Ethernet, RS 422, RS 485, MVB, CAN, RS 232, Profibus
Device address	3 bit
Keypad device front	Short-stroke keyboard upon request
Keypad backlight	upon request
Touch screen	capacitive
Front dimension (W x H)	310 mm x 214 mm
Mounting dimension (W x H x D)	280 mm x 204 mm x 88.5 mm
Weight	approx. 3.6 kg
Protection class front/rear	IP 65 / IP 54
Temperature range operation	full functionality: -25°C to +70 °C; -40°C to +70 °C (variant <i>arctic</i>)
Temperature range storage	-35°C to +85°C; -50°C to +85°C (variant <i>arctic</i>)
MTBF value	calculated approx. 100,000 hrs.
Operating system	OS LINUX, QNX™, Windows™
Applications	ETCS, diagnostics, brake control, etc.
SIL data indication	with IconTrust® up to SIL3 (upgradeable)
SIL data entry	with SelectTrust® up to SIL3 (upgradeable)



Absolutely safe
Equipped with IconTrust® & SelectTrust®, the MFTs offer a maximum of safety.

¹⁾ Available as accessory from DEUTA: Adapter/Cables/Loud-speaker front plates/serial switchbox/USB Ethernet adapter/Power supply

»DEUTA MFTS11/2 -

Safety and reliability with IconTrust®!«

- 10.4" colour TFT with 640 x 480, 18 bit, lit by LED
- Geode, LX 800, 500 MHz processor
- Safety Integrity Level SIL 3
- Safe Supervision Function: IconTrust®

Patented safety

The MFTS11/2 is equipped with the patented IconTrust® technology as standard. IconTrust® monitors dedicated areas on the TFT panel and differentiates between safety-related and non safety-related information.

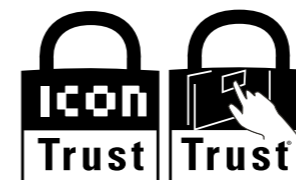
Each of the individual areas of the displayed image are analysed and compared to the value of the respective input variable during every image refresh cycle in IconTrust®. The patented procedure demonstrably ensures topicality and correctness. The generic verification is certifiable up to the SIL 3 level. If the application changes, our customers can easily modify the monitoring areas with the IVEN Engineering Tool and document it for the experts.



MFTS11/2

Feature/Specification	MFTS11/2
Display lighting	LED backlight
Dimmable lighting	0 to 350 cd/m ²
Status LEDs	3 LEDs
CPU/clock frequency	Geode, LX 800, 500 MHz
RAM memory	256 MB (incl. video memory)
Flash-EPROM	1 MB
Video memory	4 MB
Flash memory	minimum 2 GB
PC keyboard connection	USB keyboard
Additional controller	Environment Controller
Service Interface	USB and Ethernet
Buzzer	yes
Temperature management	yes
Ambient light sensor	front side
Power supply	24, 48 or 74 - 110 V (DC ±30 %)
Power consumption	typ. 25 W
Display type/size	colour TFT 10.4" (26.4 cm), additional sizes upon request
Display resolution, colour intensity	640 x 480, 18 bit, additional resolutions upon request
Ethernet	2x 10/100 BaseT as (M12 d-coded ¹⁾)
Audio out	2x Line-Out or 2x2 W loudspeakers
USB	2x USB 2.0 (M8 a-coded ¹⁾) + 1x Feature Connector
Vehicle bus, I/O	Ethernet, RS 422, RS 485, MVB, CAN, RS 232, Profibus
Device address	3 bit
Keypad device front	upon request
Keypad backlight	upon request
Touch screen	yes, resistive, scratch-proof
Front dimension (W x H)	310 mm x 214 mm
Mounting dimension (W x H x D)	280 mm x 204 mm x 65 mm
Weight	approx. 3.6 kg
Protection category front/rear	IP 65 / IP 54
Temperature range operation	-25°C to +70°C (full functionality)
Temperature range storage	-35°C to +85°C
MTBF value	calculated approx. 100.000 hrs.
Operating system	LINUX, QNX™, Windows™
Applications	ETCS, diagnostics, brake control, etc.
Safe Supervision Function	IconTrust®, SelectTrust®

¹⁾ Available as accessory from DEUTA: Adapter/Cables/Loud-speaker front plates/serial switchbox/USB Ethernet adapter/Power supply



Absolutely safe
Equipped with IconTrust® & SelectTrust®, the MFTs offer a maximum of safety.

»DEUTA MFT11/2 -

High-end terminal - singularly successful!«

- 10.4" colour TFT with 640 x 480, 18 bit, lit by LED
- Single Board Computer with AMD Geode, LX 800, 500 MHz processor
- No moving components (such as fans)
- Minor installation depth, more random access memory, energy-saving technology



Different variations in keyboard layout

The Multi-Functional Terminal MFT11/2 is used in complex control and guidance systems as a man-machine interface for process visualisation and data input.

The data is entered either via touch panel or short-stroke membrane keypad. Different keyboard layouts are available.

The MFT11/2 is based on a single board PC with AMD-GEODE™ processor. An active matrix colour display (TFT) is used for the display.



MFT11/2



MFT11/2



MFT11/2 S1

Feature/Specification	MFT11/2
Display lighting	LED backlight
Dimmable lighting	0 to 350 cd/m ²
Status LEDs	3 LEDs
CPU/clock frequency	Geode, LX 800, 500 MHz
RAM memory	256 MB (incl. video memory)
Flash-EPROM	1 MB
Video memory	4 MB
Flash memory	min. 2 GB
Extensibility	upon request
PC keyboard connection	USB keyboard
Additional controller	Environment Controller
Buzzer	yes
Temperature management	yes
Ambient light sensor	front side
Power supply	24, 48 or 74 - 110 V (DC ± 30%)
Power consumption	typ. 25 W
Display type/size	Colour TFT/6.5" (16.5 cm) Colour TFT/8.4" (21.34 cm) Colour TFT/10.4" (26.4 cm) Colour TFT/12.1" (30.7 cm)
Wide angle display	optional
Display resolution, colour intensity	640 x 480 18 bit, 800 x 600 18 bit, 1024 x 768 bit
Ethernet	2x 10/100 BaseT as (M12 d-coded ¹⁾)
Video in	up to 4 cameras
Audio out	2x Line Out or 2x2 W loudspeakers
Sound amplifier	optional
Serial interfaces	1x RS 485/RS422, RS232 (CAN variant)
USB	2x USB 2.0 (M8 a-coded ¹⁾) + 1x Feature Connector
Vehicle bus, I/O	Ethernet, MVB on board (ESD or EMD), CAN Profibus, RS 422, RS 485, RS 232, dig. inputs/outputs
Device address	3 bit
Keypad device front	Short-stroke membrane keypad
Keypad backlight	yes, LED dimmable
Touch screen	yes, resistive, scratch-proof
Front dimension (W x H)	310 mm x 214 mm
Mounting dimension (W x H x D)	280 mm x 204 mm x 47 mm
Weight	approx. 3.6 kg
Protection class front/rear	IP 65 / IP 54
Temperature range operation	-25°C to +70° (full functionality)
Temperature range storage	-35°C to +85°C
MTBF value	approx. 100,000 hrs
Operating system	OS LINUX, QNX™, Windows™
Applications	ETCS, diagnostics, brake control, etc.

¹⁾ Available as accessory from DEUTA: Adapter/ cables/loud-speaker front plates/serial switchbox/USB Ethernet adapter/Power supply

»DEUTA MFT8/2 and 9/2 -

Solutions for special requirements!«

MFT8/2

- 8.4" colour TFT with 640 x 480, 18 bit, LED lighting
- Geode, LX 800, 500 MHz processor
- Resistive touch screen
- Protection category: IP 65 front / IP 54 rear
- Installation dimension: 264 mm w x 140 mm h x 65 mm

MFT9/2

- 6.5" colour TFT with 640 x 480, 18 bit, LED lighting
- Geode, LX 800, 500 MHz processor
- Short-stroke membrane keyboard
- Protection category: IP 65 front / IP 54 rear
- Installation dimension: 308 mm w x 162 mm h x 65 mm



MFT8/2

The MFT8/2 presented a tailor-made Multi-functional 8.4" terminal for trams where MFTs with a display size of 6.5" were too small and 10.4" were too large. Whatever the matching size for your train, we will find the correct solution.

MFT9/2

As a form-fit-function compatible solution, the MFT9/2 replaces older working principles with additional features such as keypad, a control and a changeover switch as well as wired LEDs. The result: The maximum possible compatibility for the next decades.



MFT8/2



MFT9/2

Feature/Specification	MFT8/2 & MFT 9/2
Display lighting	LED backlight
Dimmable lighting	0 to 350 cd/m ²
Status LEDs	2-3 device-dependent
CPU/clock frequency	Geode, LX 800, 500 MHz
RAM memory	256 MB
Flash memory	min. 2 GB
Flash-EPROM	1 MB
Video memory	4 MB
Extensibility	upon request
PC keyboard connection	USB keyboard
Additional controller	Environment Controller
Buzzer	yes
Temperature management	yes
Ambient light sensor	front side
Power supply	24, 48 or 74 - 110 V (DC ± 30%)
Power consumption	typ. 25 W
Display type/size	MFT8/2: Colour TFT/8.4" (21.34 cm) MFT9/2: Colour TFT/6.5" (16.50 cm)
Display resolution, colour intensity	640 x 480, 18 bit
Ethernet	10/100 Base T as M12 d-coded ¹⁾
Video in	MFT8/2: 1 x Video
Audio out	MFT8/2: 2 x Line Out
Serial interfaces	MFT8/2: 1 x RS 485, IBIS upon request MFT9/2: 1 x RS 485
USB	MFT8/2: 2 x USB 1.1 (M8 a-coded ¹⁾) MFT9/2: 2 x USB
Device address	MFT8/2: 3 bit MFT9/2: 3 bit + Digital I/O
Inputs/outputs	digital I/Os
Keypad device front	MFT9/2: Short-stroke membrane keypad
Keypad backlight	MFT9/2: LED
Touch screen	MFT8/2: resistive
Front dimension (W x H)	MFT8/2: 300 mm x 186 mm MFT9/2: 376 mm x 201 mm
Mounting dimension (W x H x D)	MFT8/2: 264 mm x 140 mm x 65 mm MFT9/2: 308 mm x 162 mm x 65 mm
Weight	MFT8/2: approx. 3 kg MFT9/2: approx. 4 kg
Protection class front/rear	IP 65 / IP 54
Operating temperature	-25°C to 70°C
Temperature storage	MFT8/2: -35°C to 85°C (full functionality) MFT9/2: -25°C to 70°C
MTBF value	MFT8/2: 105,000h MFT9/2: 100,000h
Operating system	OS LINUX, QNX™, Windows™

¹⁾ Available as accessory from DEUTA: Adapters/cables/loudspeaker front plates/serial switchbox/USB Ethernet adapter/ power supply

»DEUTA MFT5/2 -

The successful compact terminal in its third generation!«

- 6.5" colour TFT with 640 x 480, 18 bit, LED lighting
- Geode, LX 800, 500 MHz processor
- Resistive touch screen
- Protection category: IP 65 front / IP 54 rear
- Installation dimension: 248 mm w x 140 mm h x 65 mm d



MFT5/2

Compact displays with 6.5" had already been deployed in trams and metro projects since the mid 1990s. The first MFD5 was delivered in 1996; the displays are now in their third generation. The use of the MFT5 as successor to the MFD5 increases the service life of the display in a form-fit-function compatible manner.



MFT5/2

Feature/Specification	MFT5/2
Display lighting	LED backlight
Backlight dimmable	0 to 350 cd/m ²
Status LEDs	2-3 device-dependent
CPU/clock frequency	Geode, LX 800, 500 MHz
RAM memory	256 MB
Flash memory	min. 2 GB
Flash-EPROM	1 MB
Video memory	4 MB
Extensibility	upon request
PC keyboard connection	USB keyboard
Additional controller	Environment Controller
Buzzer	yes
Temperature management	yes
Ambient light sensor	front side
Power supply	24 or 74 - 110V (DC ± 30%)
Power consumption	typ. 25 W
Display type/size	Colour TFT/6.5" (16,5 cm)
Display resolution, colour intensity	640 x 480, 18 bit
Ethernet	10/100 Base T as M12 d-coded ¹⁾
Video in	1 x FBAS (analogue)
Audio out	2 x Line Out
Serial interfaces	RS 442/RS 485, IBIS upon request
USB	2 x USB1.1 (M8 a-coded ¹⁾)
Vehicle bus	MVB on board (EMD)
Device address	3 bit
Keypad device front	Short-stroke membrane keypad
Keypad backlight	LED
Front dimension (W x H)	275 mm x 144 mm
Mounting dimension (W x H x D)	248 mm x 140 mm x 65 mm
Weight	approx. 2.3 kg
Protection class front/rear	IP 65 / IP 54
Operating temperature	-25°C to 70°C (full functionality)
Temperature storage	-35°C to 85°C
MTBF value	105,000h
Operating system	OS LINUX, QNX™, Windows™

¹⁾ Available as accessory from DEUTA: Adapters/cables/loudspeaker front plates/serial switchbox/USB Ethernet adapter/ power supply

»DEUTA MFT6/2 -

Much information in the 12.1" terminal!«

- 12.1" colour TFT with 800 x 600, 18 bit, LED lighting
- Geode, LX 800, 500 MHz processor
- Short-stroke membrane keypad/ resistive touch screen
- Protection category: IP 65 front / IP 54 rear
- Installation dimension: 319 mm w x 235 mm h x 47 mm d
- Easy portability of customer application due to platform concept



MFT6/2

The Multi-Functional Terminal MFT6/2 with its 12.1" SVGA TFT display is the largest in the DEUTA product range. For much useful information in the driver's console.



MFT6/2

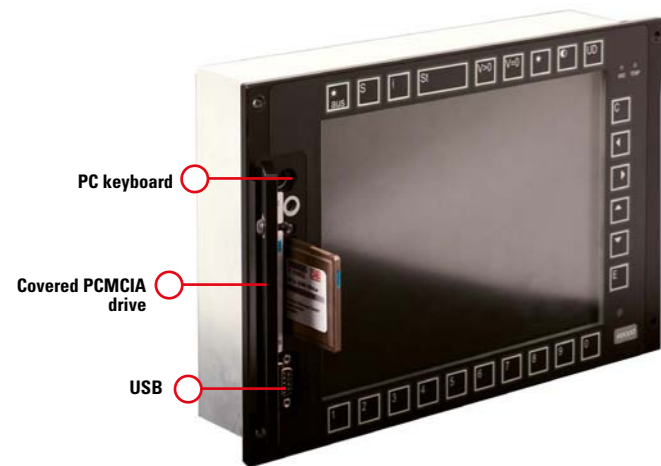
Feature/Specification	MFT6/2
Display lighting	LED backlight
Dimmable lighting	0 to 350 cd/m ²
Status LEDs	2-3 device-dependent
CPU/clock frequency	Geode, LX 800, 500 MHz
RAM memory	256 MB
Flash memory	min. 2 GB
Flash-EPROM	1 MB
Video memory	4 MB
Extensibility	upon request
PC keyboard connection	USB keyboard
Additional controller	Environment Controller
Buzzer	yes
Temperature management	yes
Ambient light sensor	front side
Power supply	24 od. 74 - 110V (DC ± 30%)
Power consumption	typ. 25 W
Display type/size	Colour TFT/12.1" (30.7 cm)
Display resolution, colour intensity	800 x 600, 18 bit (optional 1024 x 768)
Ethernet	2x 10/100 Base T as M12 d-coded ¹⁾
Video in	4 x FBAS (analogue)
Audio out	2 x Line Out or 2 x 2 W loudspeakers
Serial interfaces	1 x RS 422/RS 485
USB	2 x USB2.0 (M8 a-coded ¹⁾)
Digital Input / Output	+ Feature Connector
Vehicle bus	MVB on board (EMD or ESD), Ethernet
Device address	3 bit
Keypad device front	Short-stroke membrane keypad
Keypad backlight	LED
Touch screen	resistive, scratch-proof
Front dimension (W x H)	349 mm x 245 mm
Mounting dimension (W x H x D)	319 mm x 235 mm x 47 mm
Weight	approx. 3.8 kg
Protection class front/rear	IP 65 / IP 54
Operating temperature	-25°C to 70°C
Temperature storage	-35°C to 85°C
MTBF value	105,000h
Operating system	OS LINUX, QNX™, Windows™

¹⁾ Available as accessory from DEUTA: Adapters/ cables/loudspeaker front plates/serial switchbox/ USB Ethernet adapter/ power supply

»DEUTA MFT102 - EBUla Display -

flexible, powerful and low-maintenance!«

- 10.4" TFT with 640 x 480, 256 K colours, LED lighted
- AMD Fusion, Dual-Core processor 1 GHz
- Internal Flash disk with 2 GB
- Protection category: IP 54 front / IP 21 rear
- Environmental Controller
- Approved for the "EBuLa" application by the DB AG



Low-maintenance structure

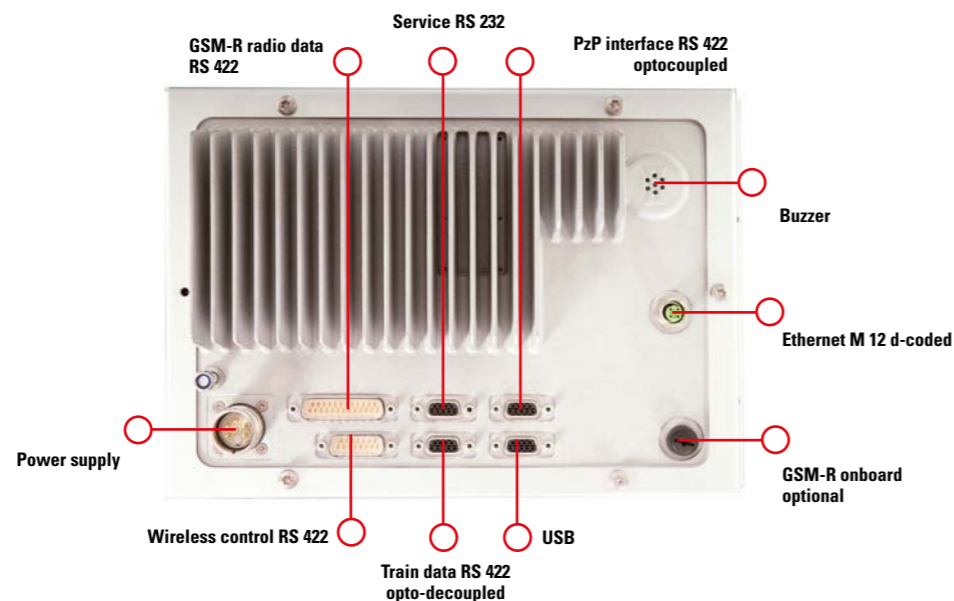
The EBUla display has omitted the accumulator block, fan, CD-ROM and hard disk, thus making the MFT102 a nearly maintenance free device.

Reduced installation depth

More room in the driver's console thanks to the reduced installation depth of 88.5 mm.

Environmental Controller

Simplified operating time diagnostics, optimally scheduled maintenance intervals and screen contents that can be read out at any time, and keyboard confirmations.



MFT102

Flexible system

Easily expandable system with integrated PC 104 interface. Next to the main EBUla application under WIN XP Embedded®, additional applications can be used simultaneously under different operating systems such as, e.g. LINUX, QNX™ or WINDOWS™.

High performance

The high performance of the MFT 102 permits parallel applications.

Compliant with standards

The MFT 102 complies with the standards: EN 50155-V.2001, EN 50121-3-2, EN 61000-6-4, and EN 61000-6-2, LESDB.

Feature/Specification	MFT102
Technology	TFT
Resolution, colour intensity	640 x 480, 256 K colours
Screen diagonal	10.4", 26.4 cm
Lighting	LED backlight
Dimmable lighting	automatic regulation
CPU/clock frequency	AMD Fusion, Dual-Core processor, 1 GHz
RAM memory	1 GB
Flash-EPROM	for BIOS and setup data
Video memory	16 MB
CFast™ Card	2 GB
Additional controller	yes
Slot for vehicle bus	optional onboard (e.g. CAN)
Expansion options	optional
Ethernet	10 BASE-T; 100 BASE-Tx M 12d
Serial interfaces	RS 232 for service, RS 422 for train data, LZB, PzP 2x RS 422 for EBUla radio approved for GSM-R by the DB AG
USB connection	D-Sub front and rear
PC card (PCMCIA)	yes
Ambient light sensor	front side
Keypad device at front	Short-stroke membrane keypad
Keypad backlight	LED
PC keyboard connection	yes, front face
Power supply	24 to 110 VDC
Power consumption	< 40 W
Mounting dimension (W x H x D)	310 x 214 x 88.5 mm
Temperature range operation	-25°C to 70°C (full functionality)
Temperature storage	-35°C to +85°C
Weight	approx. 4.5 kg
Protection class front/rear	IP 54 / IP 21
MTBF value	100,000 hrs.

»DEUTA DAT2050

Compact & Brilliant«

- 5.0" TFT, 800 x 480 display resolution / 400 cd/m² lighting
- ARM, 1 GHz processor
- improved power consumption due to innovative technology
- sophisticated HMI in lean design
- wide range power supply with maximum efficiency



DAT2050kwc / DAT2050kwr	
Display type	5" TFT display
Display resolution	800 x 480 Pixel
Display lighting	LED-backlight
Dimmable lighting	automatically 0 up to 350 cd/m ²
Status LED	operating LED (yellow)
Buzzer	yes (approx. 3 kHz frequency)
Luminance	400 cd/m ² , contrast: 350:1
Angle of view	-57° to +55° (hor) / -62° to +62° (vert)
Ambient light sensor	1 front side
Input unit	capacitive touch (RAL9005), optical bonded
CPU/clock frequency	ARM CPU, 1 GHz
Memory	min. 512 MB
Storage medium	internal flash drive min. 16 GB
Power supply	24 V DC up to 110 V DC (±30%)
Power consumption	10 W
Vehicle bus DAT2050kwc	1x CAN Bus: D-Sub 9-pin, female UNC 4/40
Vehicle bus DAT2050kwr	1x RS485, D-Sub 9-pin, female UNC 4/40
Ethernet interfaces	1x Ethernet, 1Gbit, interface: M12, x-coded, 8-pin, female
USB interfaces	1x USB interface: M8, 4-pin pins, female
Width	143 mm
Height	100 mm
Depth	approx. 113 mm
Weight	approx. 1.5 kg
Protection category front/rear	IP 65 / IP 40
Temperature range operation	-25 °C up to +70 °C
Temperature range storage	-40 °C up to +80 °C
MTBF value	approx. 106,000 h
Operating system	LINUX
Project software	customised
EN standards	EN50155, EN 50121-3-2, EN55011, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61373, EN45545-2:2013
CE	yes
Accessories	plug for power supply – D-Sub mixed layout, 2-pins Type: Conec 2W2C, heavy current

DAT2050

Thanks to its lean design DAT2050 can be applied as HMI in many fields. Even smallest details are sharply shown in a visualisation due to a high resolution of 800 x 480 pixels.

»DEUTA DAT1080/2080 –

Optional with IconTrust® and SelectTrust® up to SIL 3«

DAT1080/2080

- 8" WVGA terminals
- ARM, 500 MHz processor
- as redundant version in use for ETCS applications with STM/NTC (Specific Transmission Module)/(National Train Control)
- optional with patented IconTrust® safety technology

DAT1080/2080

The DAT can be used optionally as single display or as redundant double display to increase the availability.

With its compact housing shape, the DAT in the redundant double display variant is compatible with the standard 10" displays.

As an option the DAT series can be equipped with the patented IconTrust® technology as standard. IconTrust® monitors predefined areas on the TFT display, analyses the displayed image and compares the image data with the value of the initial input variable. In the event of deviations, IconTrust® triggers a safety-oriented response.

SelectTrust is the first technology worldwide to demonstrably secure correct manual input of information via touchscreen.



Absolutely safe

Equipped with IconTrust® & SelectTrust®, the DATS offers a maximum of safety.

DAT1080/2080

Display type	Colour TFT 8" WVGA
Display resolution	480 x 800 pixel
Display lighting	LED backlight
Dimmable lighting	0 to 500 cd/m2
Status LEDs	3 LEDs
Luminance	500cd/m², contrast: 450:1
Angle of view	-80° to +80° (hor) / -80° to +80° (vert)
Ambient light sensor	2 front face
Input unit	capacitive touch
CPU/clock frequency	ARM CPU, 1GHz
Memory	512MB, DDR RAM
Storage medium	Internal Flash Drive min. 4GB
Power supply	24V DC to 110 V DC (±30%)
Power consumption	max. 20 W
Vehicle bus	Diverse buses possible (MVB, CAN, Profibus, Ethernet)
Ethernet interfaces	2x Ethernet interfaces, standard: as per IEEE 802.3 10BaseT and 100BaseTx
USB interfaces	2x USB interfaces, standard: as per USB2.0, up to 480 MBit/s (for service purposes)
RS422/485 interfaces	1x RS 422/485, standard: as per IEEE RS422 or IEEE RS485
Audio	1x 8 W at 8 ohm (others as option)
Width	240 mm
Height	150 mm
Depth	< 100 mm, with plug
Weight	Approx. 3 kg
Protection category front/rear	IP 65 / IP 50
Temperature range operation	-25 °C to +70 °C
Temperature range storage	-40 °C to +85 °C
MTBF value	approx. 89,500 hrs.
Safe Supervision Function (optional)	safe display: IconTrust® Plus Generic, up to SIL 3 safe input: SelectTrust®, up to SIL 2
Operating system	LINUX
Project software	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
Accessories	Plug for power supply - 12-pole; redundant switch Scha 151 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 double display: Connecting cable vehicle bus DSUB9 4/40 UNC, ETH/ETH M12/M12

»DEUTA MFTR -

Redundant display solutions!«

- Two redundant 8" colour terminals
- 10.4" total surface
- ARM , 500 MHz processor
- optimised for ETCS and LZB



MFTR8/2

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

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.



MFTR8/2



MFTRS1080

Feature/Specification

	MFTR8/2 MFTRS1080
	consisting out of 2 DATS2080kwa respectively 2 DATS1080kwa
	for DAT2080kwa and DAT1080kwa
Display type	Colour TFT 8" WVGA
Display resolution	480 x 800 pixel
Display lighting	LED backlight
Dimmable lighting	0 to 500 cd/m2
Status LEDs	3 LEDs
Luminance	500cd/m², contrast: 450:1
Angle of view	-80° to +80° (hor) / -80° to +80° (vert)
Ambient light sensor	2 front face
Input unit	capacitive touch
CPU/clock frequency	ARM CPU, 1GHz
Memory	512MB, DDR RAM
Storage medium	Internal Flash Drive min. 4GB
Power supply	24V DC to 110 V DC (±30%)
Power consumption	max. 20 W
Vehicle bus	Diverse buses possible (MVB, CAN, Profibus, Ethernet)
Ethernet interfaces	2x Ethernet interfaces, standard: as per IEEE 802.3 10BaseT and 100BaseTx
USB interfaces	2x USB interfaces, standard: as per USB2.0, up to 480 MBit/s (for service purposes)
RS422/485 interfaces	1x RS 422/485, standard: as per IEEE RS422 or IEEE RS485
Audio	1x 8 W at 8 ohm (others as option)
Width / Height / Depth	240 mm / 150 mm / < 100 mm, with plug
Weight	Approx. 3 kg
Protection category front/rear	IP 65 / IP 50
Temperature range operation	-25 °C to +70 °C
Temperature range storage	-40 °C to +85 °C
MTBF value	approx. 89,500 hrs.
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Operating system	LINUX
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CE	Yes
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»Engineering competence!

DEUTA Know-How - unique and unbeatable!«

- System solutions that meet customer requirements, upon request with approvals and SIL certification
- Own board development
- Highly specialised expert knowledge
- High manufacturing depth due to outstanding process and product competence
- In-house application development



Own board development

DEUTA develops for every Multi-Functional Terminal an own motherboard solution that is based on a common platform. The DEUTA printed circuit board specialists pursue a sustainable product strategy for serviceable displays and long-term security of investment.

Precisely projected - MFTs in the SIL system

The Multi-Functional Terminals with IconTrust® together in interaction with the indicators, sensors and REDBOX® recorders form the DEUTA Safety System.

Every DEUTA Safety System is configured specific to project in accordance with the CENELEC standard DIN EN 50128. The system characteristic is variable and ranges from simple product combinations to sophisticated project characteristics up to SIL 4.

As the only provider in the worldwide market, DEUTA configures products of its own design and production to a safe speed system.

Upon request, DEUTA will also assume communications with the system expert. Our customers can count on DEUTA's experience and precision - which will save time and money.

