

DEUTA

Multi-Functional Terminals



DEUTA-WERKE 
Technology under Control



Ser. Nr.
0000000 651

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.

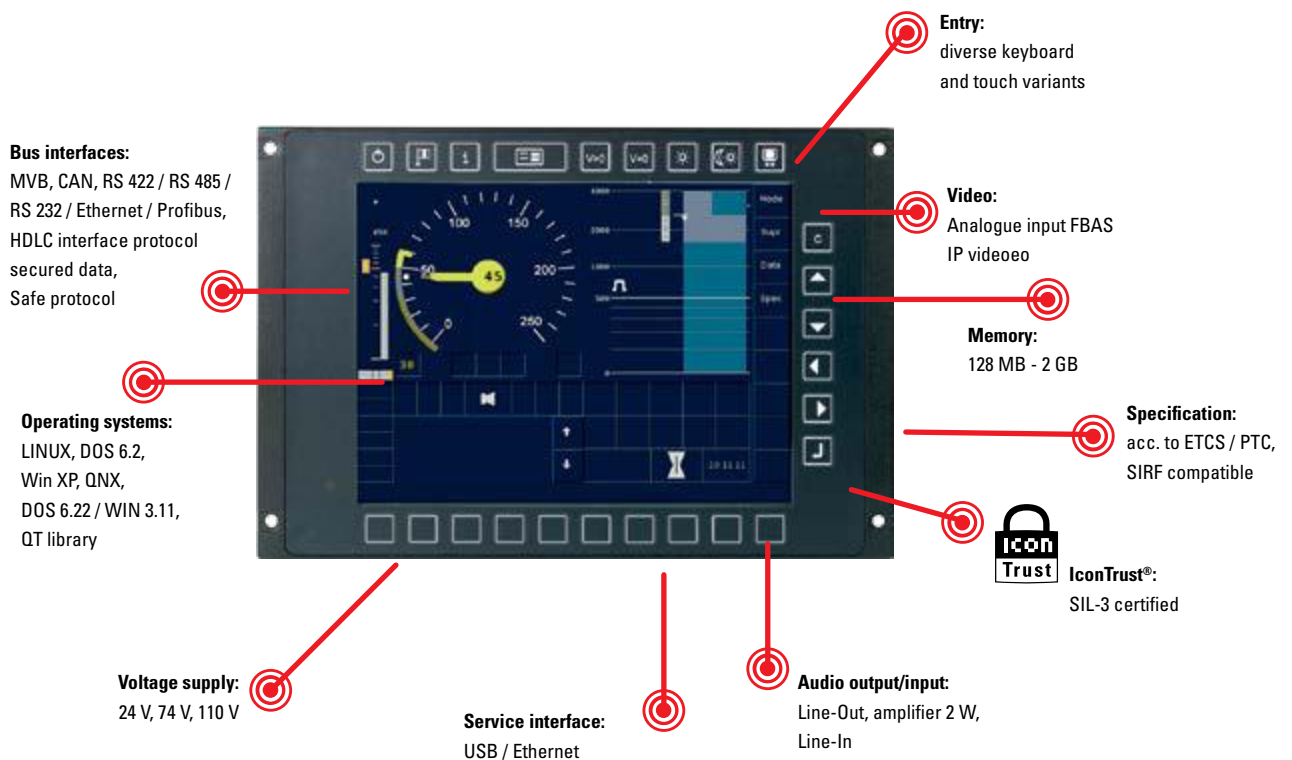
Tailor-made!



»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® -

You can trust!«

- Patented safety technology
- 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

What is IconTrust®?

IconTrust® is a stand-alone monitoring technology which is integrated as a small module with large safety effect into the safety-relevant display.

IconTrust® reliably checks safety-related data and immediately recognises deviations. A Multi-Functional Terminal equipped with **IconTrust®** will only display secure data you can trust.

Operating principle

IconTrust® monitors dedicated areas on the TFT panel. Screen sections with safety-critical information are configured to monitoring areas.

Even overlapping areas can be monitored exclusively and at the same time. 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®**.

Application

IconTrust® is the generic solution for all TFT displays which must satisfy SIL requirements. This includes, e.g., displays in driver's consoles and controller equipment in rail traffic.

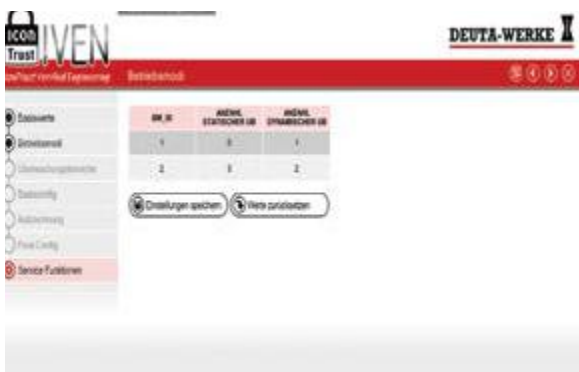
Adjustments outside the monitored areas to existing applications do not need to be verified again. Our customers can simply adjust the safety areas and contents with the **IVEN** configuration tool. This saves on costs for complex recertification.

»IVEN - IconTrust® Verified Engineering- reliable entries!«



With the **Iven** Engineering Tool, our customers independently configure the safety-critical and project-specific monitoring areas on the TFT panel - simply, quickly and clearly.

Iven offers a preview of the configured monitoring areas and checks the configuration for consistency. In the process, **Iven** records all process values with the corresponding screen photo, transfers the configuration to the **IconTrust®** module and automatically generates the PDF validation report.



»DEUTA MFT 111 -

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 MFT 111 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 MFT 111: 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 MFT 111 also fits into tight installation conditions. When equipped with the optionally available IconTrust, the MFT 111 is converted into the SIL terminal MFT S111 with a maximum of certified evaluated safety.



MFT 111

Feature/Specification	MFT 111
Display lighting	LED backlight
Dimmable lighting	0 to 350 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, 48 or 74 - 110 V (DC \pm 30%) (wideband optional)
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, or upon request 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	yes, 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 88.5 mm
Weight	approx. 3.6 kg
Protection class 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	OS LINUX, QNX™, Windows™
Applications	ETCS, diagnostics, brake control, etc.
SIL certificate	IconTrust®

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

»DEUTA MFT S11/2 -

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 MFT S11/2 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.





MFT S11/2

Feature/Specification	MFT S11/2
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®



Absolutely safe

Equipped with IconTrust®, the MFT S11/2 offers a maximum of safety.

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

»DEUTA MFT 11/2 -

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



Examples of the different variations of the MFT 11/2

Different variations in keyboard layout

The Multi-Functional Terminal MFT 11/2 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 MFT 11/2 is based on a single board PC with AMD-GEODE™ processor. An active matrix colour display (TFT) is used for the display.



MFT 11/2



MFT 11/2



MFT 11/2 S1

Feature/Specification	MFT 11/2
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 MFT 8/2 and 9/2 -

Solutions for special requirements!«

MFT 8/2

- 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

MFT 9/2

- 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



MFT 8/2

The MFT 8/2 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.

MFT 9/2

As a form-fit-function compatible solution, the MFT 9/2 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.





MFT 8/2



MFT 9/2

Feature/Specification	MFT 8/2 & 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	MFT 8/2: Colour TFT/8.4" (21.34 cm) MFT 9/2: 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	MFT 8/2: 1 x Video
Audio out	MFT 8/2: 2 x Line Out
Serial interfaces	MFT 8/2: 1 x RS 485, IBIS upon request MFT 9/2: 1 x RS 485
USB	MFT 8/2: 2 x USB1.1 (M8 a-coded ¹⁾) MFT 9/2: 2 x USB
Device address	MFT 8/2: 3 bit MFT 9/2: 3 bit + Digital I/O
Inputs/outputs	digital I/Os
Keypad device front	MFT 9/2: Short-stroke membrane keypad
Keypad backlight	MFT 9/2: LED
Touch screen	MFT 8/2: resistive
Front dimension (W x H)	MFT 8/2: 300 mm x 186 mm MFT 9/2: 376 mm x 201 mm
Mounting dimension (W x H x D)	MFT 8/2: 264 mm x 140 mm x 65 mm MFT 9/2: 308 mm x 162 mm x 65 mm
Weight	MFT 8/2: approx. 3 kg MFT 9/2: approx. 4 kg
Protection class front/rear	IP 65 / IP 54
Operating temperature	-25°C to 70°C
Temperature storage	MFT 8/2: -35°C to 85°C (full functionality) MFT 9/2: -25°C to 70°C
MTBF value	MFT 8/2: 105,000h MFT 9/2: 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 MFT 5/2 -

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



MFT 5/2

Compact displays with 6.5" had already been deployed in trams and metro projects since the mid 1990s. The first MFD 5 was delivered in 1996; the displays are now in their third generation. The use of the MFT 5 as successor to the MFD 5 increases the service life of the display in a form-fit-function compatible manner.



MFT 5/2

Feature/Specification	MFT 5/2
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 \pm 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 (ESD), CAN, DIN
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 MFT 6/2 -

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



MFT 6/2

The Multi-Functional Terminal MFT 6/2 with its 12.1" SVGA TFT display is the largest in the DEUTA product range. For much useful information in the driver's console.



MFT 6/2

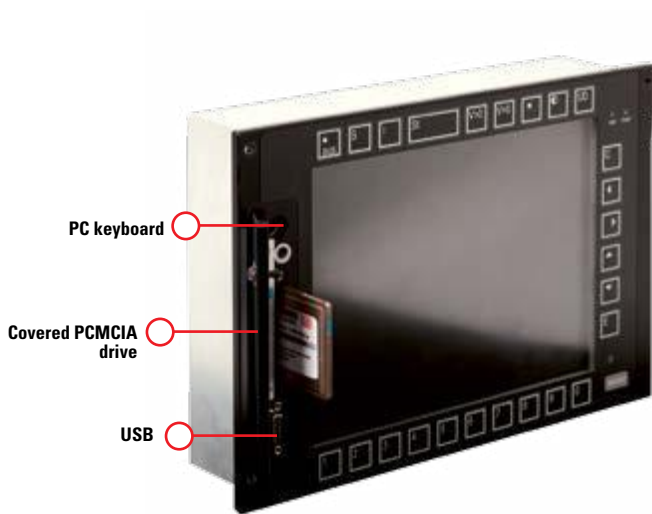
Feature/Specification	MFT 6/2
Display lighting	LED backlight
Dimmable lighting	0 to 350 cd/m ²
Status LEDs	2-3 device-dependent
CPU/clock frequency	Geode, LX 800, 500 MHz
RAM memory	256 MB
Flash memory	min. 2 GB
Flash-EPROM	1 MB
Video memory	4 MB
Extensibility	upon request
PC keyboard connection	USB 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 MFT 102 - EBUla Display -

flexible, powerful and low-maintenance!«

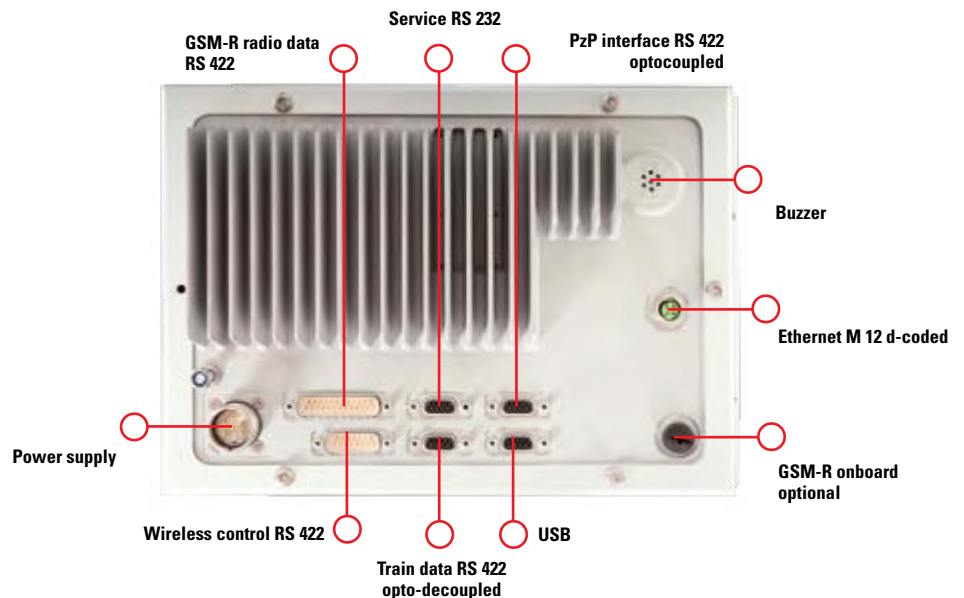
- 10.4" TFT with 640 x 480, 256 K colours, LED lighted
- AMD Fusion, Dual-Core processor 1 GHz
- Internal Flash disk with 2 GB
- Protection category: IP 54 front / IP 21 rear
- Environmental Controller
- Approved for the "EBuLa" application by the DB AG



Low-maintenance structure
The EBUla display has omitted the accumulator block, fan, CD-ROM and hard disk, thus making the MFT 102 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.





MFT 102

Flexible system

Easily expandable system with integrated PC 104 interface. Next to the main EBUa 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	MFT 102
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 EBUa 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 DST 1 050 Q - Smart Terminal -

Retrofit terminal with SIL 2 safety!«

- 5" colour TFT, 640 x 640 screen resolution / 1,000 cd/m² lighting
- ARM technology
- TFT indicator with additional functions
- Safety Integrity Level SIL 2 - SIL 4
- Safe Supervision Function: IconTrust® optional
- extremely compact, also ideal as fall-back level for information such as, e.g. Full Supervision, Speed or ETCS

Form-fit function

The DEUTA Smart Terminal 1 050 Q replaces analogue indicating units without requiring slot expansion.

Added information

Next to traditional analogue indication information, the DST 1 050 Q offers additional options such as, e.g., pressure, traction force or filling level. As an option to a clearly structured display, further useful information is combined for optimum use of the slot in the driver's console.

Added safety

With IconTrust® DEUTA Smart Terminals are converted into safe man-machine interfaces with SIL 2-capability. User software such as, e.g., ETCS, speed or Full-Supervision indicators can be updated quickly and easily.



DST 1 050 Q are form-fit-function compatible with ESG 14 cy



DST 1 050 Q

Feature / Specification	DST 1 050 Q
Panel cutout	138 ⁺¹ x 138 ⁺¹ mm
Installation depth	approx. 140 mm incl. connection
Weight	approx. 0.7 kg
Screen resolution	640 x 640
Display type / size	Colour TFT / 5"
Touch screen	Optional
Lighting	1000 cd/m ²
IconTrust®	Optional
Computer core	ARM technology
Mounting	at the housing
Protection category front	IP54
Protection category plug	IP40
Connection	1 x 9-pole D-Sub 1x 25 pole D-Sub
Operating voltage	24V DC ±30 %
Actuation	RS 485
Output	RS 485
Error message	via TFT display
Temperature range	-25°C to +70°C
Test voltage	1,000 V _{eff} , 50 Hz, 1 min
Vibration testing	EN 61373 category 1, class B
Device definition	EN 50155
Approval	–
Housing	Black anodised aluminium
Additional indicator (optional)	2 signal lamps, 1 LCD error display with software to a TFT
Operating system	LINUX

»DEUTA MFT R -

Redundant display solutions!«

MFT R 8/2

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

MFT R 11/2

- 6.5" colour TFT with 640 x 480, 18 bit, LED lighting
- Geode, LX 800, 500 MHz processor
- Short-stroke membrane keyboard
- optimised for C2 ATP



MFT R 8/2

Two redundant full-value 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-value, 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.

MFT R 11/2

The four most important parts of travel information are displayed as needed on the digital display of the MFT R 11/2. The train driver can manually switch between the TFT and the digital display. When upgrading to the MFT R 11/2, the 10.4" applications do not need to be adapted to the existing application.





MFT R 8/2



MFT R 11/2

	MFT R 8/2	MFT R 11/2
	consisting of 2 DATS2080kwe	
Feature/Specification	per DAT 2080kwe	
Display lighting	LED backlight	LED backlight
Dimmable lighting	0 to 350 cd/m ²	0 to 350 cd/m ²
Status LEDs	3	2-3 device-dependent
CPU/clock frequency	ARM, CPU, >500 MHz	Geode, LX 800, 500 MHz
RAM memory	512 MB	256 MB
Flash memory	minimum 4 GB	minimum 2 GB
Video memory		4 MB
Flash-EPROM	1 MB	1 MB
Extensibility	upon request	upon request
PC keyboard connection	USB keyboard	USB keyboard
Additional controller	Environment Controller	Environment Controller
Service Interface	USB and Ethernet	
Buzzer	yes	yes
Temperature management	yes	yes
Ambient light sensor	front side	front side
Power supply	24 - 110V (DC ± 30%)	24 - 110V (DC ± 30%)
Power consumption	typ. 22 W	typ. 22 W (for one DMI)
Display type/size	colour TFT / 8"	colour TFT / 10.4"
Display resolution, colour intensity	480 x 800, 18 bit	480 x 800, 18 bit
Ethernet	10/100 Base T as M12 d-coded ¹⁾	10/100 Base T as M12 d-coded ¹⁾
Vehicle bus	2x MVB	MVB or Profibus
Audio out	amplifier output 1 x 8W	
Serial interfaces	1 x RS 485, IBIS upon request	1 x RS 485/RS422, RS232 (CAN variant)
USB	2x USB 2.0 (M8 a-coded ¹⁾)	2x USB 2.0 (M8 a-coded ¹⁾) + 1x Feature Connector
Device address	3 bit	3 bit
Keypad device front	none	none
Keypad backlight	none	none
Touch screen	capacitive	capacitive
Weight	approx. 3 kg	approx. 4 kg
Protection category front/rear	IP 65 / IP 40	IP 65 / IP 54
Operating temperature	-25 °C to 70°C (full functionality)	-30°C to 70°C
Temperature storage	-25°C to 85°C	-25°C to 70°C
MTBF value	> 89.000 hrs.	> 100.000 hrs.
Operating system	LINUX, others upon request	LINUX (others upon request)
Applications	ETCS, diagnostics, brake control, etc.	ETCS, diagnostics, brake control, etc.
Safe Supervision Function	IconTrust®, SelectTrust®	
Feature/Specification	per MFT R 8/2	
Front dimension (W x H)	652 mm x 244 mm	407 mm x 245 mm x 62 mm
Mounting dimension (W x H x D)	372 mm x 211 mm x 80 mm	295 mm x 222 mm x 62 mm
Indicator light	EZ155b	

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

»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.

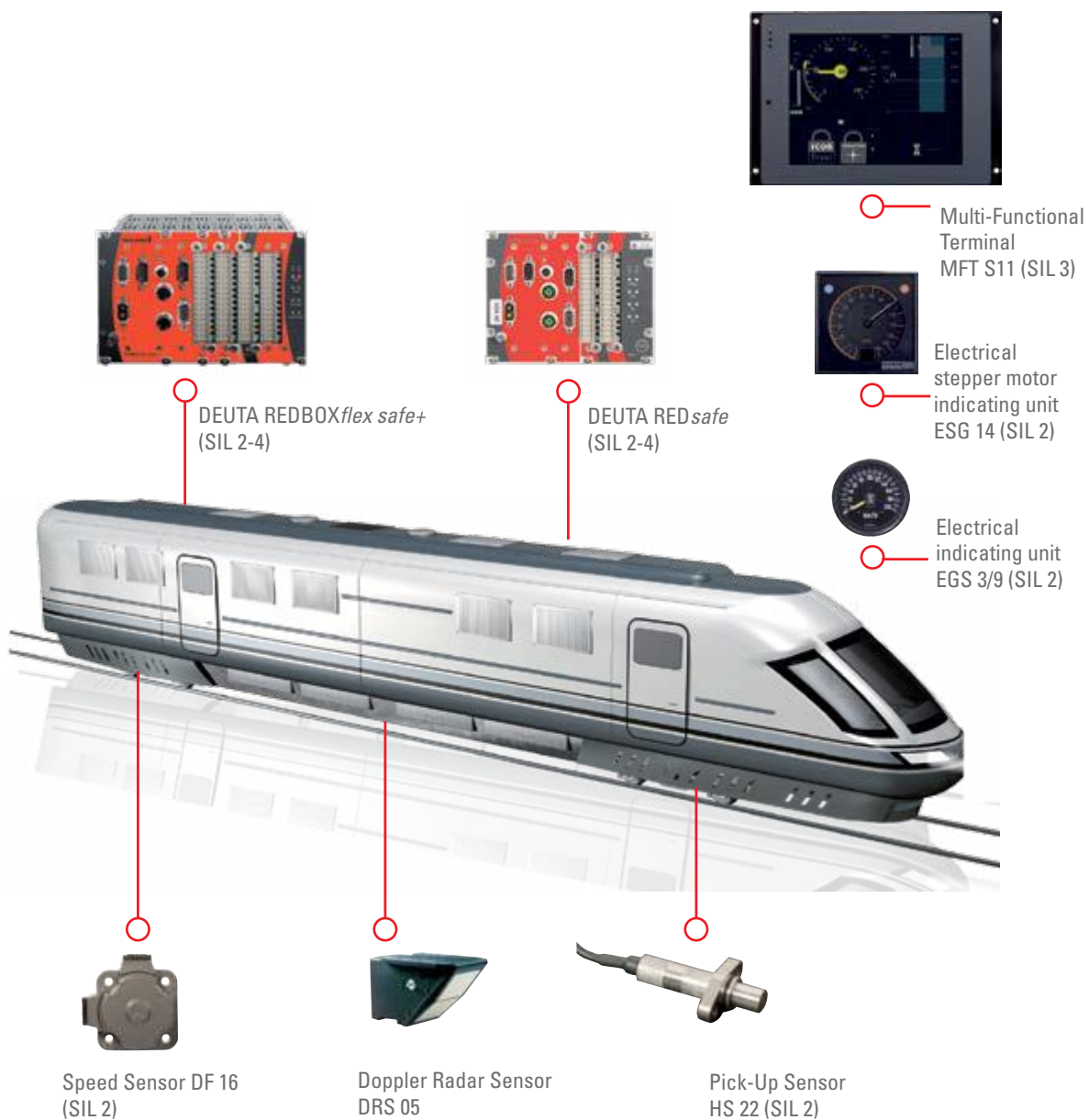
Precisely projected - MFTs in the SIL system

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.



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