



# VSX-advanced

## VSX Displays

### KEY FEATURES

- Designed and built to operate perfectly in harsh working conditions
- Important data of a machine can be visualized in many different ways
- Input options for operation via softkeys and/or a touch screen
- Flexible mounting variants
- The connection to the control system is realized with field bus systems
- Intuitive programming via the graphical interface of the development kit
- Functional safe: SIL2 profiles

### TECHNICAL DATA

- Available in 8", 10", 12" and 16" wide
- Cortex A9 Dual Core @ 800 MHz
- Display brightness up to 1300 cd/m<sup>2</sup>, viewing angle up to ±85°
- Operation via key and/or touch screen
- 2 CAN interfaces, 4 digital inputs, 2 digital outputs
- 2 analog camera inputs (PAL/NTSC), 1 displayable in parallel

### ACCESSORIES

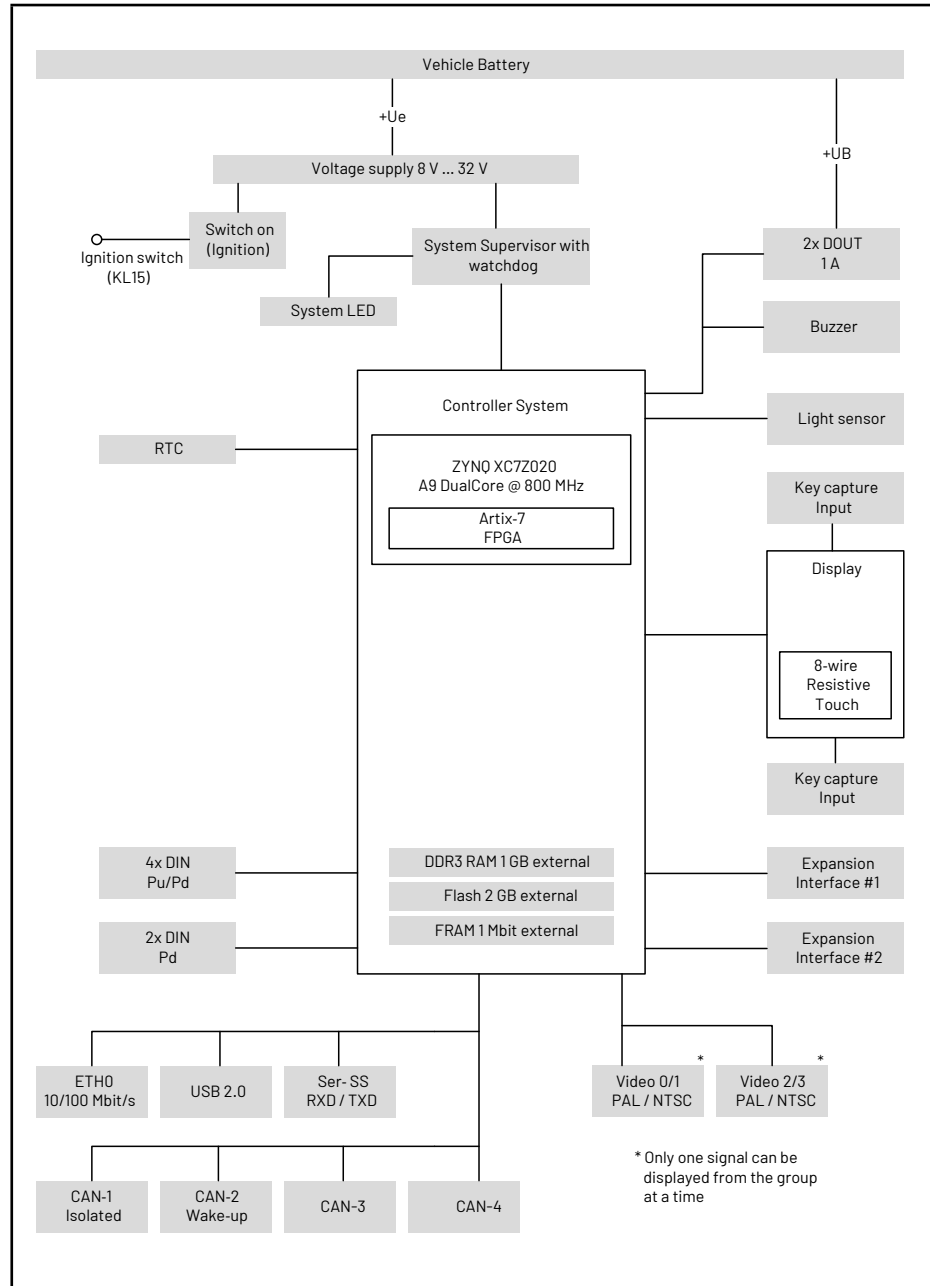
- Ethernet cable
- Video cable
- USB to M12 cable
- Mating plug set Superseal, 26 pol.
- Development connection cable (Banana connectors/SUBD), 2 m
- Connection Cable to unconnected wire
- Various RAM-Mount articles

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## BLOCK DIAGRAM



## TECHNICAL DATA

### Configuration

VSX-advanced-	8	10	12	10w
Screen size	8.4"	10.4"	12.1"	10.6"
Aspect ratio (Portrait/Landscape)	4:3	4:3	4:3	15:9
Brightness	1000 cd/m <sup>2</sup>	1000 cd/m <sup>2</sup>	1300 cd/m <sup>2</sup>	1000 cd/m <sup>2</sup>
Contrast	600:1	700:1	800:1	1000:1
Resolution	1024 x 768	1024 x 768	1024 x 768	1280 x 768
Viewing Angles	H ± 80° V + 80° / - 60°	H ± 85° V ± 85°	H ± 80° V ± 80°	H ± 85° V ± 85°
Glass finish	Standard 3H (GFG 7H optional)			
Operating option(s) – several possible	Touch (Keys optional, Encoder on request)			
MTTH (Mean Time To Half Brightness)	100.000 h			
Mounting Options:	Front mount/VESA mount			

### Processor and memory

Processor	Cortex A9 DualCore 800 MHz
RAM	512 MB DDR3 RAM 16-Bit
NAND-Flash	1 GB Flash with error correction ECC
FRAM	256 kbit

### Communication Interfaces

Ethernet 1	10/100 Mbit/s
CAN 1	Without galvanic isolation
CAN 2	With CAN WakeUp
USB Host	1x USB 2.0
Analog Video In 1, 2 (PAL/NTSC)	1 out of 2 displayable

## TECHNICAL DATA

### Communication Interfaces

Digital I/O	In (NPN/PNP)	4 x
	Out (1A)	2 x

### Miscellaneous

Real Time Clock	Battery buffered (10 years, external) (Gold cap buffered (24 h) Optional)
Buzzer	1 x
Streaming Ethernet Video	H.264 Hardware accelerated 4 x 4 CIF (Softwareoption)
OpenGL graphical effects and 3D	OpenGL ES 1.1 GPU Hardware acceleration (Softwareoption)
Expandability	On request
Temperature	- 30 °C ... +70 °C

### Safety option

SIL 2 HW-Plattform (optional)	SIL 2 Visualization/Touchscreen/Keys/Video/ Communication available with SIL 2 HW-platform and appropriate widgets
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## TECHNICAL DRAWING

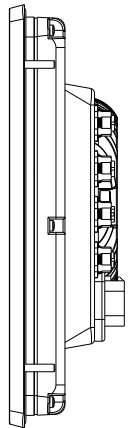
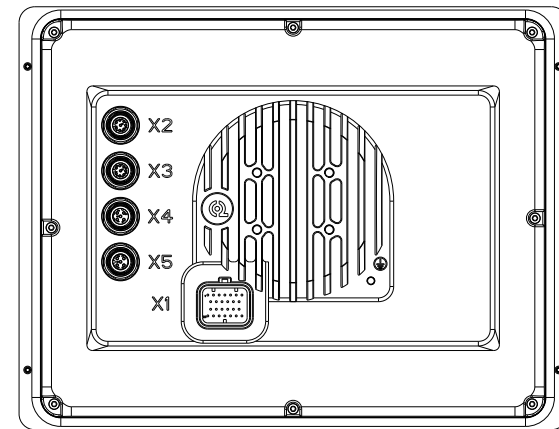
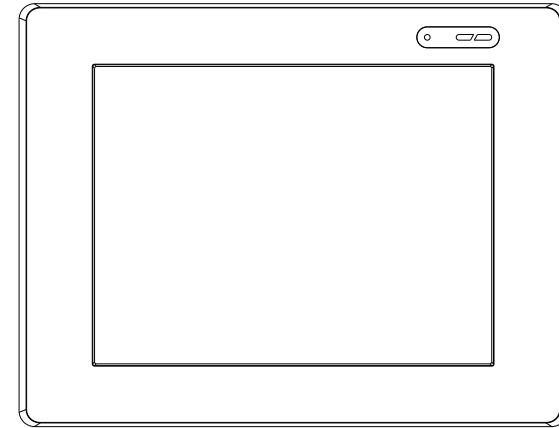
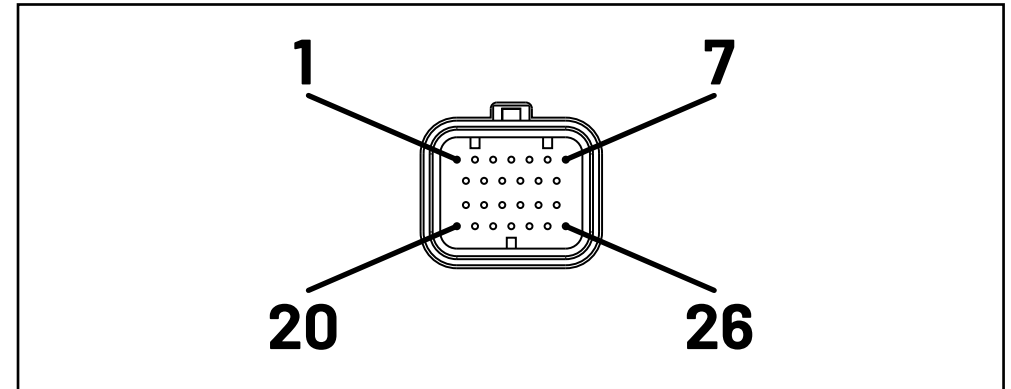


Illustration example, exact drawings on request

# PIN ASSIGNMENT VSX-advanced

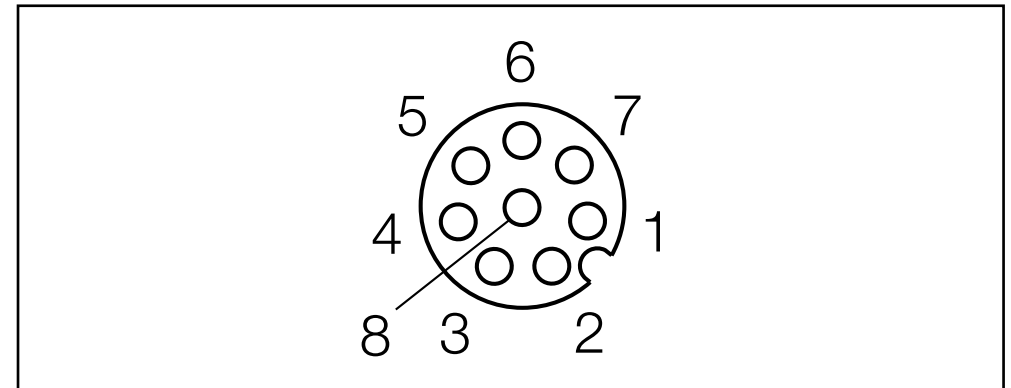
## Pin assignment of connector X1 sorted by pin numbers

X1 Pin	Signal description	X1 Pin	Signal description
1	Digital input DIN0 low/high side	14	Not used
2	Digital input DIN4 low/high side	15	Digital output DOUT1
3	Digital output DOUT0 GND	16	Supply voltage KL15+
4	Supply voltage UBAT+	17	CAN 2 low
5	CAN 1 high	18	Not used
6	Not used	19	RS232 RxD
7	External lithium battery for real time clock (RTC), battery minus (-)	20	Digital input DIN1 low/high side
8	Not used	21	Digital input DIN5 low/high side
9	Digital output DOUT0	22	Digital output DOUT1 GND
10	Supply voltage UE+	23	Supply voltage UBAT-GND for digital inputs
11	CAN 1 low	24	CAN 2 high
12	Not used	25	Not used
13	External lithium battery for real time clock (RTC), battery plus (+)	26	RS232 TxD



## Pin assignment of connector X2 sorted by pin numbers

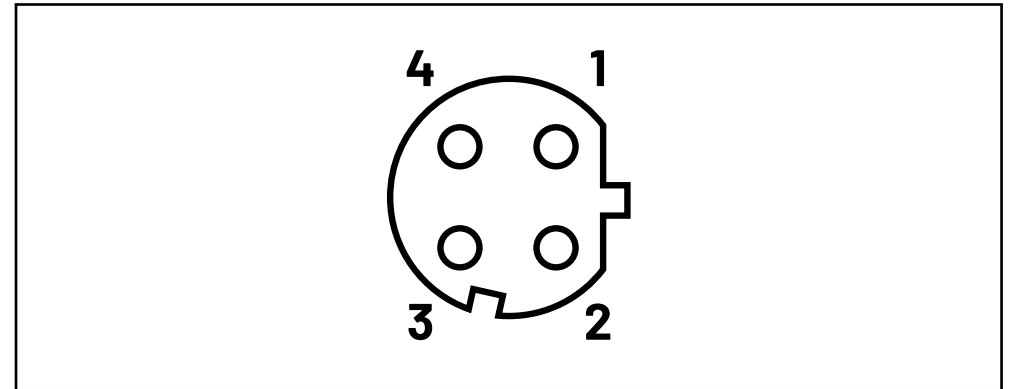
X2 Pin	Signal description
1	Analog Video In 1: Signal GND
2	Analog Video In 1: Signal +
3	Analog Video In 1: 12 V output (250 mA)
4	Analog Video In 1: 12 V output GND
5	Analog Video In 2: 12 V output GND
6	Analog Video In 2: Signal GND
7	Analog Video In 2: Signal +
8	Analog Video In 2: 12 V output (250 mA)
Housing	Outer conductor (shield)



## PIN ASSIGNMENT VSX-advanced

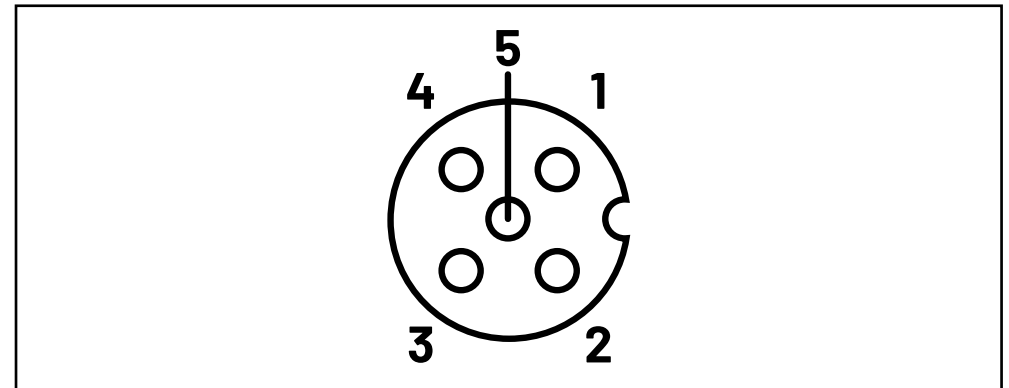
### Pin assignment of connector X4 sorted by pin numbers

X4 Pin	Signal description
1	TXp
2	RXp
3	TXn
4	RXn
Housing	Ethernet outer conductor (shield)



### Pin assignment of connector X5 sorted by pin numbers

X5 Pin	Signal description
1	5 V at 500 mA
2	USB-Dn
3	USB-Dp
4	Not Used
5	GND
Housing	Ethernet outer conductor (shield)



## DETAILED QUALIFICATIONS

### EMC industrial (CE)

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Immunity for industrial environments	DIN EN 61000-6-2:2006
Emission standard for residential, commercial and light industrial environments	DIN EN 61000-6-3:2011

### EMC automotive

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UN/ECE Regulation No.10 – Severity Level Class IV	ISO 7637-2:2004
Electrical transient conduction along supply lines only – Severity Level Class IV	ISO 7637-2:2011
Voltage transient emissions test	ISO 7637-2:2011
Conducted emissions - Voltage method – on Single leads/Power Supply Lines	CISPR25, DIN EN 55025
Conducted emission - Current probe method – on Signal lines/Communication Lines	CISPR25, DIN EN 55025
Radiated emissions from components - ALSE method (emissions antenna) 150 kHz to 2.5 GHz, 1 m, 120 kHz bandwidth	CISPR25, DIN EN 55025
Radiated immunity	ISO 11452-2:2004
Stripline: 10 kHz-400 MHz, 100 V/m	ISO 11452-5:2002
Antenna, ALSE: 200 MHz - 2 GHz, 100 V/m	
Electr. Transient transmission by capacitive and inductive coupling via lines other than supply lines - Severity Level Class IV	ISO 7637-3:2016
Road vehicles - Test methods for electrical disturbances from electrostatic discharge	ISO 10605:2008

### Electrical tests

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Road vehicles - Environmental conditions and testing for electrical and electronic equipment - Part 2: Electrical loads - Electric loads Code Letters: U=12V [C] / U = 24V [E]	ISO 16750-2:2012
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### Climatic and mechanical tests

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Road vehicles - Environmental conditions and testing for electrical and electronic equipment - Mechanical Loads Code Letters: [D/ E/ K/ L]	ISO 16750-3:2012
Surface strength/ scratch and abrasion resistance	ISO 16750-3:2012
Gravel bombardment	ISO 16750-3:2012
Vibration (sinusoidal)	DIN EN 60068-2-6:2008
Shock, Bump	DIN EN 60068-2-27:2010
Road vehicles - Environmental conditions and testing for electrical and electronic equipment - Climatic Loads Code Letters: [Z/ H]	ISO 16750-4:2010
Road vehicles - Degrees of protection (IP code) - Protection of electrical equipment against foreign objects, water and access - IP-Codes IP6kx, IPx5, IPx7	ISO 20653:2013
Road vehicles - Environmental conditions and testing for electrical and electronic equipment - Chemical Loads Code Letters: [on request]	ISO 16750-5:2010