



## Operating panel series GSt-A043





The original housing color may differ from the illustration shown here.

In addition to being equipped with modern technology and a low-reflection display that is easy to read in daylight, the operating device with its eye-catching color design emphasizes the contrast to the harsh environment of a construction machine in outdoor use. The intuitive operation of the navigation keys focuses on the optimal realization of the human-machine interface. Display brightness and key illumination can be adjusted by software. The flat, functional design fits perfectly into all booths and its customized look also makes a strong statement for the machine manufacturer.

- ❖ Specially developed for use in mobile machines
- ❖ Robust yet lightweight aluminum die-cast housing for outdoor use
- ❖ Installation via clamping bracket or assembly with a standard ball holder
- ❖ Display easy to read even in direct sunlight
- ❖ Very wide reading angle in all directions
- ❖ Short stroke keys with tactile feedback
- ❖ Key illumination in RGB
- ❖ Free programming with GSe-VISU®



GSt-A043-101 Side view:  
Extra slim housing design



GSt-A043-101 Rear view:  
Flexible RAM® Mounting (Accessories)

## Application example



## Technical specification

### Display and input media

Display	Colour-TFT
Format	16:9 (WQVGA), approx. 95 x 54 mm, 4,3" diagonal
Resolution	480 x 272 pixel
Backlight	1000 cd/m <sup>2</sup> (typical)
Contrast ratio	800:1 (typical)
Viewing angle	85°, 85°, 85°, 85° (Θ <sub>y+</sub> , Θ <sub>y-</sub> , Θ <sub>x+</sub> , Θ <sub>x-</sub> )
Cover lens	Mineral clear glass
Keys	8 tactile illuminated keys
Key illumination	LED, RGB, individually controllable and dimmable

### Mechanical data

Faceplate material	Aluminum die-cast, powder-coated
Housing material	Aluminum die-cast, powder-coated
Dimensions (W x H x D)	ca. 147 x 128 x 27 mm
Installation dim. (W x H)	139,5+0,5 x 120,5+0,5 mm
Weight	Approx. 500 g
Assembly	Surface mounting with RAM®-Mount Panel mounting with clamping bracket
Protection class	IP65 + IP67 <sup>1</sup>
Operating temperature	-30°C ... 70°C
Storage temperature	-30°C ... 80°C

### Electrical data

Supply voltage	VCC 8 ... 32 VDC
Nominal voltage	24 VDC
Power consumption	≤7W
Current consumption in Standby-Mode	UB = 12VDC <100µA UB = 24VDC <200µA
Fuse	External, value 3A
Processor	ARM® Cortex® A7
Memory	256 MB RAM   64 MB Flash   8 kB FRAM
Interfaces	2x CAN 1x Ethernet 1x USB 4x Video input 1x Ignition input 1x Digital output

<sup>1</sup> Only valid with correctly screwed on connectors or protective caps

**Electrical data**

1x RS485 (option on request)  
Possible interface variants see connector pinout and product variants

**Other equipment**

Temperature monitoring	Integrated sensor for measuring the device temperature
Supply voltage monitoring	Measuring circuit for monitoring the supply voltage
Brightness adjustment	Ambient light sensor in front panel for brightness adjustment of display and keys
Clock / battery	Real time clock (RTC), battery buffered (Year, month, day, week day, hour, minute, second)
Wake-On-Key	When not in use (e.g. in the outdoor area of a machine), the operating device can be set to a sleep mode. Pressing any key for approx. 3s or rising edge at IGNITION input restarts the unit.

**Software / Programming**

Operating System	GSe-OS® Linux based, fast boot operating system
Development Environment	C-programmable via GSe-VISU® Software

**Interfaces**

Interface	Protokolle und Spezifikationen
CAN0 ... 1	CAN Interface Version 2.0 A/B, 125 kBit/s up to 1 MBit/s acc. ISO 11898-1:2003 and ISO 11898-2:2003 Layer 2, GS-CAN, J1939, CANopen Slave, openSYDE External bus termination with 120 Ohm is required.
ETH	100BASE-TX IEEE 802.3u Data rate 10/100 Mbit/s Protocols: TCP/IP, UDP/IP, DHCP, OPC-UA, Modbus TCP, openSYDE, HTTP, FTP, MQTT, SSL
USB	USB 2.0 Hi-Speed, Data rate up to 480 Mbit/s, USB Host USB Power supply (out) 5 Volt Output current per interface ≤ 500 mA
Video <sub>IN0...3</sub>	4 FBAS-inputs, 1 V <sub>ss</sub> , 75 Ω (Inputs switchable, one video input presentable) Supported video standards: PAL and NTSC
IGN	Ignition input, digital input Input resistance 105 kOhm Switch-on level ~7,4 Volt Switch-off level Adjustable by software
D <sub>OUT</sub>	Digital output, High-Side-Driver, Supply via U <sub>B</sub> (as power supply for camera) Switching voltage U <sub>B</sub> Switching current 0 ... 1 A PWM capable Up to 1 kHz output frequency Protective circuit for inductive loads Integrated Current readback Integrated Protective device Short circuit proof
RS485	Protocol: Modbus RTU

**Test standards / Certification**

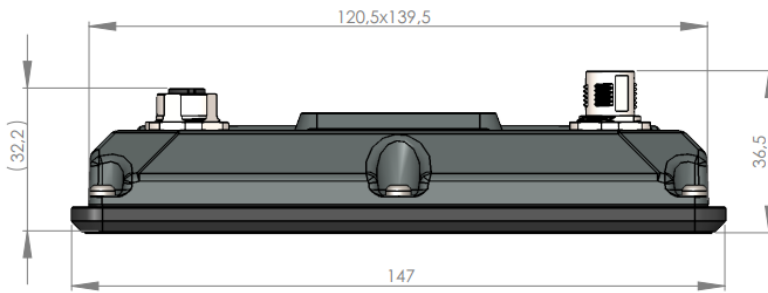
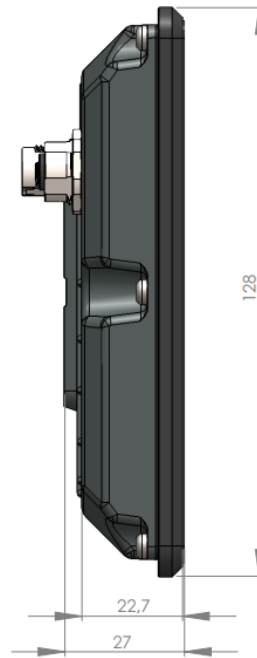
CE mark	Acc. EMC directive 2014/30/EU Acc. RoHS directive 2011/65/EU
EMC	EN 61000-6-2:2019-11 EN 61000-6-3:2011-09 EN 61000-4-2:2009-12 EN 61000-4-4:2013-04 EN 61000-4-5:2019-03 EMC Immunity for industrial environments EMC Emitted interference for residential areas ESD, Level 4: 15 kV Immunity against burst, Level4: 4 kV Immunity against surge, Level 3: 1 kV
Load Dump	ISO 16750-2:2012-11 Load Dump Without Suppression Test A 24V R <sub>i</sub> =1,0 Ohm, t <sub>d</sub> = 100 ms, U <sub>a,max</sub> = 170 V
Vibration	IEC 60068-2-64:2020 random 8h per axis 10 ... 299 Hz 1g 300 ... 499 Hz 0,05g 500 ... 2000 Hz 2g
Shock	EN 60068-2-27:2010-02 30g / 18ms; 5 shocks
Cold	EN 60068-2-1:2008-01 Test temperature -30°C   2h
Dry heat	EN 60068-2-2:2008-05 Test temperature 70°C   2h
Temperature change	EN 60068-2-14:2010-04 -30 °C ... +70°C, 20 Zyklen à 300 Min
Temperature shock	EN 60068-2-14:2010-04 -30 °C ... +70°C, 5 Zyklen à 120 Min
Damp heat	EN 60068-2-38:2010-06 Test Z/AD Test temperature 65°C / 93%RH with -10°C cold phase / 21 Days
E1 mark	UN/ECE-R10, certificate not available for all variants

**General accessories (not included)**

<b>Article Number</b>	<b>Description</b>
190111	Surface mounting set with RAM® ball holder
190112	Panel mounting set with clamping brackets
185320	GSe-VISU® Software development environment for applications

**Note:**  
The accessories listed here are not included in the scope of delivery of the device and must, depending on the type of installation, be ordered separately if required.  
Due to different variants, the possible cable accessories can be found in the description of the pin assignment

Mechanical dimensions



All dimensions are given in [mm].  
 Housing color (here: basalt grey RAL7012) and number of connectors may differ from the drawing shown here.

# Product variants

GSt- A 043 - 1 0 3

**Series name**

A-Series

**Display size**

043 = 4,3 inch

**Unit design**

1 = with optical bonding, GSe-OS  
 9 = without optical bonding, GSe-OS  
 A-Z = customer specific variant

**Housing colour**

0 = Basalt grey RAL7012  
 1 = Ruby red RAL3003

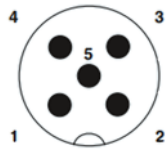
**Interface configuration**

0 = 1x M12: 1x CAN  
 1 = 2x M12: 1x CAN + Ethernet + USB  
 2 = 2x M12: 2x CAN + Video 4 in 1 + U<sub>B</sub> CAM  
 3 = 2x M12: 2x CAN + USB + Video 2 in 1

Standard-variants	Article-number	Bonding	CAN0	CAN1	Ethernet	USB	Video	Digital-Out	E1 certificate
GSt-A043-100	160515	✓	✓						✓
GSt-A043-900	160535		✓						✓
GSt-A043-101	160516	✓	✓		✓	✓			✓
GSt-A043-901	160530		✓		✓	✓			✓
GSt-A043-102	160517	✓	✓	✓			✓ (4)	✓	
GSt-A043-902	160536		✓	✓			✓ (4)	✓	
GSt-A043-103	160525	✓	✓	✓		✓	✓ (2)		
GSt-A043-903	160537		✓	✓		✓	✓ (2)		

## Pin assignment

### Pin assignment main connector (all variants)



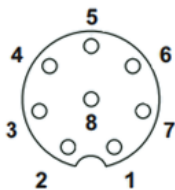
M12 A-coded 5 pin, male

Pin	Signal	Description
1	IGN	Ignition input (clamp 15)
2	U <sub>B</sub>	Power supply (clamp 30)
3	GND	Ground (clamp 31)
4	CAN_H	CAN0 High
5	CAN_L	CAN0 Low

### Cable accessories for main connector

Article Number	Description
190113	CAN Cable / Ub, 5p M12 -> open end 3m

### Pin assignment interface connector variant -xx1



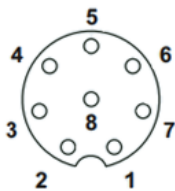
M12 A-coded, 8 pin, female

Pin	Signal	Description
1	USB_D-	USB Data-
2	USB_VBUS	USB power supply out
3	GND	(USB) Ground
4	Ethernet TPO_N	Ethernet Transmit -
5	Ethernet TPI_P	Ethernet Receive+
6	Ethernet TPO_P	Ethernet Transmit +
7	USB_D+	USB Data+
8	Ethernet TPI_N	Ethernet Receive -

### Cable accessories for interface connector variant -xx1

Article Number	Description
190114	GSt-A043 Y-Cable Ethernet / USB, 8p M12 -> RJ45/USB-A, 1.5m
190117	GSt-A043 Ethernet cable, 8p M12 -> RJ45, 1.5m
190118	GSt-A043 USB cable, 8p M12 -> USB-A 1.5m
190122	GSt-A043 Universal cable 8p M12 -> open end 3m

### Pin assignment interface connector variant -xx2



M12 A-coded, 8 pin, female

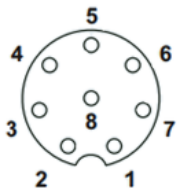
Pin	Signal	Description
1	Video <sub>IN</sub> 0	Video input 0
2	Video <sub>IN</sub> 1	Video input 1
3	GND	Ground
4	CAN1_H	CAN1 High
5	Video <sub>IN</sub> 2	Video input 2
6	CAN1_L	CAN1 Low
7	DOU <sub>T</sub> _UCam	Digital output
8	Video <sub>IN</sub> 3	Video input 3

### Cable accessories for interface connector variant -xx2

Article Number	Description
190119	GSt-A043 Video cable incl. Ub Cam, 8p M12 -> 4p Mini-DIN 1.5m
190120	GSt-A043 Y-cable Video/CAN incl. Ub Cam, 8p M12 -> p Mini-DIN / 5p M12, 1.5m
190121	GSt-A043 CAN cable, 8p M12 -> 8p M12 1.5m
190122	GSt-A043 universal cable 8p M12 -> open end 3m



**Pin assignment for interface connector variant -xx3**



M12 A-codes, 8 pin, female

Pin	Signal	Description
1	USB_D-	USB Data-
2	USB_VBUS (+5V DC)	USB power supply
3	GND	Ground
4	CAN1_H	CAN1 High
5	Video <sub>IN2</sub>	Video input 2
6	CAN1_L	CAN1 Low
7	USB_D+	USB Data+
8	Video <sub>IN3</sub>	Video input 3

**Cable accessories for interface connector variant -xx3**

Article Number	Description
190121	GSt-A043 CAN Cable, 8p M12 -> 8p M12 1.5m
190122	GSt-A043 Universal cable 8p M12 -> open end 3m

# Support and Contact

## Notes and warnings

Incoming goods inspection

This product has been produced, tested and packed with the utmost care. Nevertheless, we ask you to check the device and accessories immediately after receipt for possible transport damage and defects. The exact scope of delivery can be found on the delivery note. A damaged device should, if possible, be returned in its original packaging.

The following information must be attached to the device:

- a detailed description of the defect,
- your name and address

Electrical shock hazard

Make sure that the device is put into operation only by trained specialist personnel. The qualified personnel must have sufficient knowledge of the following areas:

- Automation technology
- Control Technology
- Control Engineering

When installing the device, comply with the relevant EN, DIN and VDE standards!

Danger to life due to incorrect input or incorrect operation

Our operator panels are only suitable for operating, monitoring and controlling processes. In order to prevent dangerous conditions on machines or systems after incorrect entries via the HMI device, malfunction or failure of the HMI device, suitable measures must be taken by programming or designing the HMI device.

Caution! Malfunction due to interferences

Before connection, make sure that the supply and data cables are protected against EMC influences.



We reserve the right to make technical changes without prior notice. Printing errors and changes are reserved.



## Contact

Graf-Sytec GmbH & Co. KG  
 Neue Wiesen 12  
 D-78609 Tuningen

Tel: +49 (0) 7464 98 66 0  
 Fax: +49 (0) 7464 98 66 770  
 Mail: info@graf-sytec.de  
 URL: www.graf-sytec.de

Technical Support

Tel: +49 (0) 7464 98 66 255  
 Mail: support@graf-sytec.de

Order Processing

Tel: +49 (0) 7464 98 66 222

Data Sheet Version

3.3 released 05-26-2023