ifm electronic

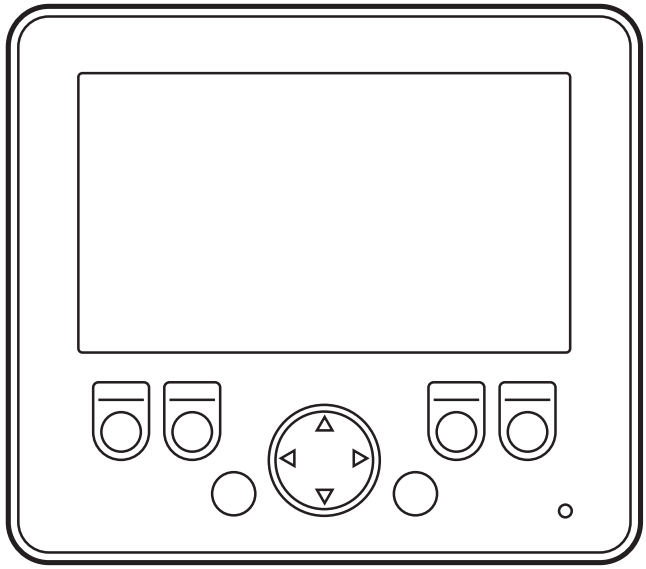
CE

Installation instructions
BasicDisplay XL

UK

ecomat100

CR0452



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Contents

This document is the original instructions.

1 Preliminary note

This document applies to devices of the type "BasicDisplay XL" (art. no.: CR0452). It is deemed as a part of the unit.

This document is intended for specialists. These specialists are people who are qualified by their appropriate training and their experience to see risks and to avoid possible hazards that may be caused during operation or maintenance of the device. The document contains information about the correct handling of the device.

Read this document before use to familiarise yourself with operating conditions, installation and operation. Keep this document during the entire duration of use of the device.

UK

Adhere to the safety instructions.

1.1 Symbols used

► Instructions
> Reaction, result
[…] Designation of keys, buttons or indications
→ Cross-reference


Important note
Non-compliance can result in malfunction or interference.


Information
Supplementary note

1.2 Warning signs used

⚠ WARNING
Warning of serious personal injury.
Death or serious irreversible injuries may result.

⚠ CAUTION
Warning of personal injury.
Slight reversible injuries may result.

NOTE
Warning of damage to property.

2 Safety instructions

2.1 General

These instructions contain texts and figures concerning the correct handling of the device and must be read before installation or use.

Observe the operating instructions. Non-observance of the instructions, operation which is not in accordance with use as prescribed below, wrong installation or incorrect handling can seriously affect the safety of operators and machinery.

2.2 Target group

These instructions are intended for authorised persons according to the EMC and low-voltage directives. The device must only be installed, connected and put into operation by a qualified electrician.

2.3 Electrical connection

Disconnect the device externally before handling it. If necessary, also disconnect any independently supplied output load circuits.

If the device is not supplied by the mobile on-board system (12/24 V battery operation), it must be ensured that the external voltage is generated and supplied according to the criteria for safety extra-low voltage (SELV) as this voltage is supplied without further measures to the connected controller, the sensors and the actuators.

The wiring of all signals in connection with the SELV circuit of the device must also comply with the SELV criteria (safety extra-low voltage, safe electrical isolation from other electric circuits).

If the supplied SELV voltage is externally grounded (SELV becomes PELV), the responsibility lies with the user and the respective national installation regulations must be complied with. All statements in this document refer to the device the SELV voltage of which is not grounded.

The connections may only be supplied with the signals indicated in the technical data and/or on the device label and only the approved accessories of ifm electronic may be connected.

2.4 Tampering with the device

In case of malfunctions or uncertainties please contact the manufacturer. Any tampering with the device can seriously affect the safety of operators and machinery. This is not permitted and leads to the exclusion of any liability and warranty claims.

3 Functions and features

BasicDisplay XL is a programmable graphic display for controlling, parameter-setting and operation of mobile machines and plants.
Communication with other system components is ensured via a CAN interface.

Application-specific extensions and adaptations are possible in conjunction with additional products of the modular ecomatmobile Basic products.

⚠ WARNING

The device is not approved for safety-related tasks in the field of operator protection.

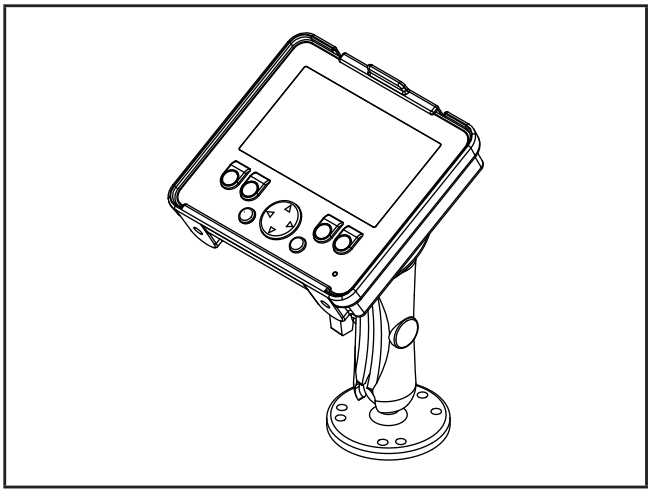
NOTE

The device is intended for installation in vehicle bodies, not in engines.

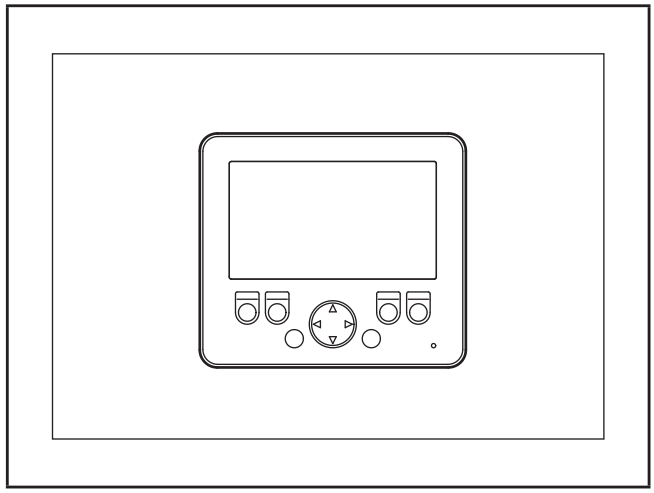
3.1 Features at a glance

- 4.3" colour display
- 6 freely programmable backlit function keys
- Navigation key for cursor function
- CAN interface
- Freely programmable in accordance with IEC 61131-3 with target visualisation

3.2 Application examples



Display with RAM® mount set



Display in panel

3.3 ecomatmobile Basic (examples)

- BasicController (art. no.: CR040x)
  Mobile controller, freely programmable to IEC 61131-3
  2 CAN interfaces (incl. interface for BasicDisplay CR0451 or BasicDisplay XL CR0452)
  Configurable inputs/outputs

- BasicRelay (art. no.: CR0421)
  Freely wirable relay and fuse carrier for 6 automotive relays and 10 automotive fuses
- Connection cable (art. no.: EC0454)
  For 1 BasicController CR040x and 1 BasicDisplay CR045x
- Connection cable (art. no.: EC0455)
  For 2 devices BasicController CR040x and 1 BasicDisplay CR045x
  (→ 5.3.1 Example accessories)
- RAM® mount set (art.-no.: EC0406)
  For BasicDisplay XL CR0452

For information about the available ecomatmobile Basic series see:
www.ifm.com → Product line → Systems for mobile machines
or directly
www.ifm.com → Data sheet search → e.g. CR0452 → Accessories

4 Installation

4.1 General installation instructions

4.1.1 Types of mounting and required accessories

Mounting type		Required accessories	Article no.
Installation	e.g. in panel cutout	Mounting frame	EC0404
RAM® mount	e.g. as desktop unit that can be aligned in various directions	RAM® mount set	EC0406
Setup	e.g. on a control panel	–	–

4.1.2 Items supplied

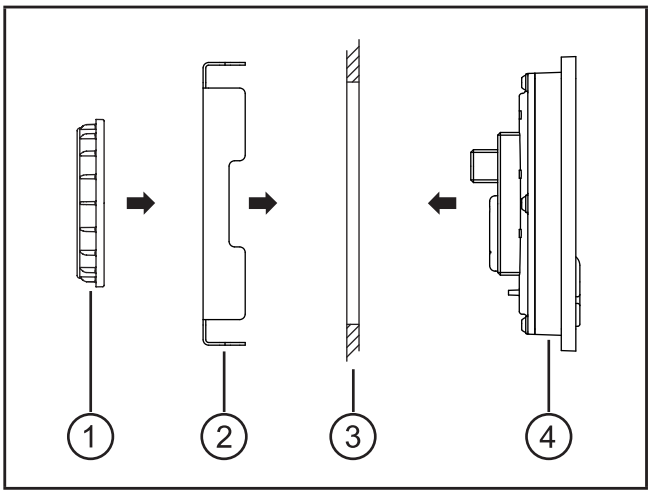
The device is supplied with an M52 nut.
This nut is needed for panel and surface mounting.

You can find more information about the available accessories at:
www.ifm.com → Data sheet search → CR0452 → Accessories

4.2 Panel mounting

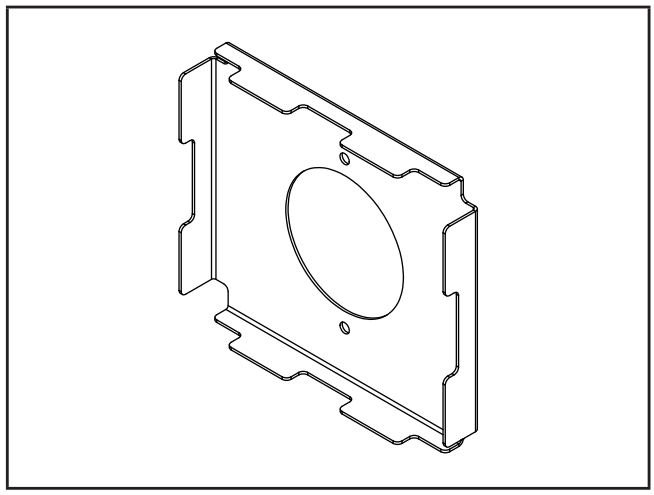
Suitable for material thicknesses up to 3 mm.

- ► Make a cut-out.
  Cutout dimensions for panel mounting (→ 8 Technical data)
- ► Remove the M52 nut from the device.
- ► Insert the device into the cutout.
- ► Place the mounting frame onto the device from the back.
- ► Screw the M52 nut onto the device and tighten by hand.



Mounting principle

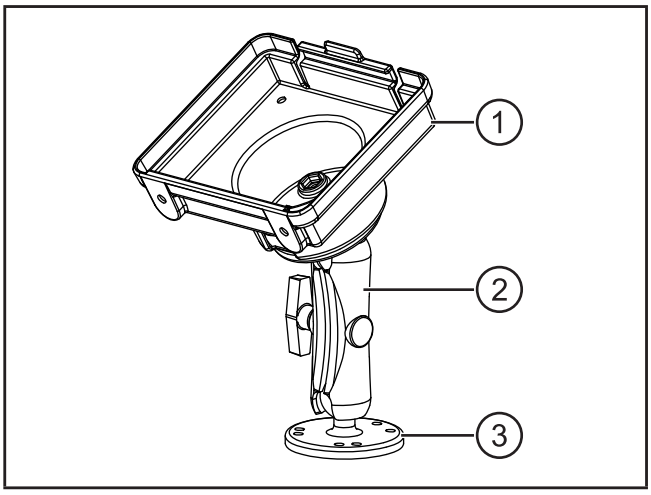
1: M52 nut
2: Mounting frame
3: Panel
4: BasicDisplay XL



Mounting frame EC0404

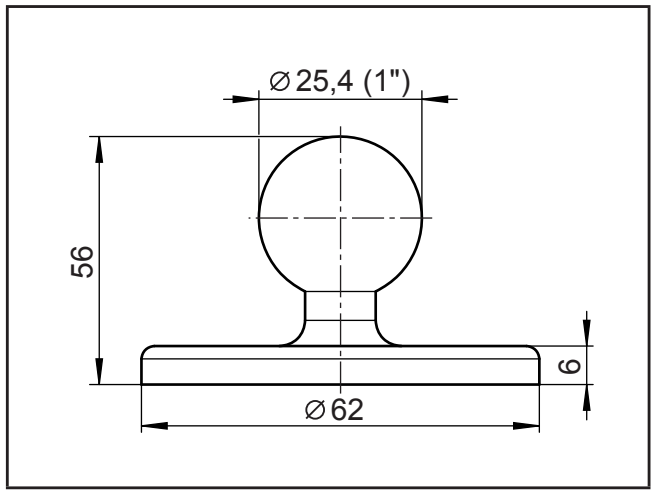
4.3 RAM® mount

Using the RAM® mount set, available as accessories, the device can be used as a firmly mounted desktop unit. Two balls allow a variable orientation of the unit.



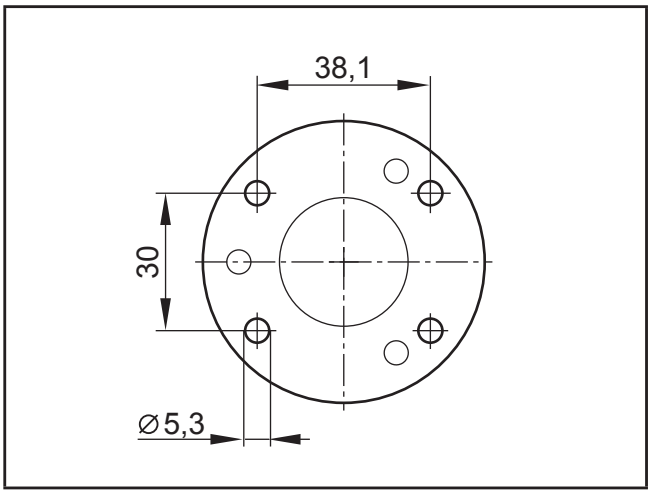
RAM® mount set EC0406

1: Display carrier
2: Mounting arm with fastening screw
3: Mounting plate with ball (2 pcs)

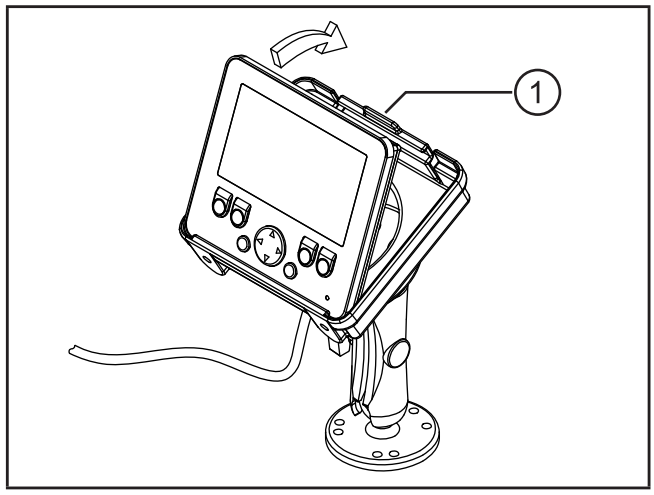


Mounting plate with ball

► Screw the mounting plate onto an even surface.
Tightening torque: 5 ±0.5 Nm
► Srew second mounting plate to the display carrier.
► Slightly loosen the fastening screw of the mounting arm.
► Place the mounting arm onto the balls and tighten the fastening screw.



Hole dimensions for mounting plate



Display carrier

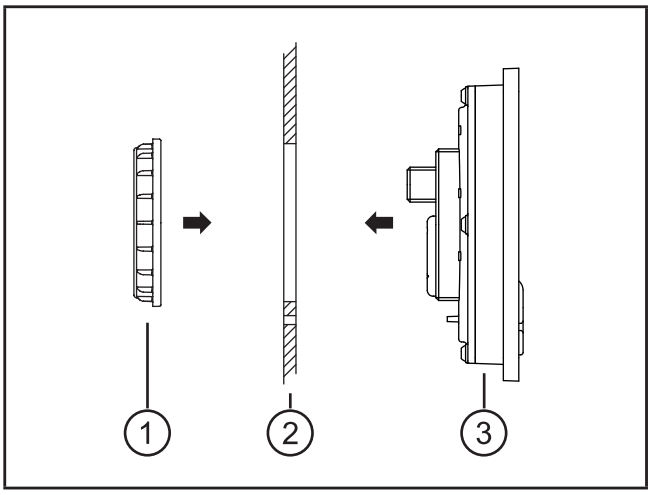
1: Snap-in

► Insert the device in the display carrier and clip it in place.
In the lower area the display carrier has a hole for the plug and cable pass-through.

4.4 Surface mounting

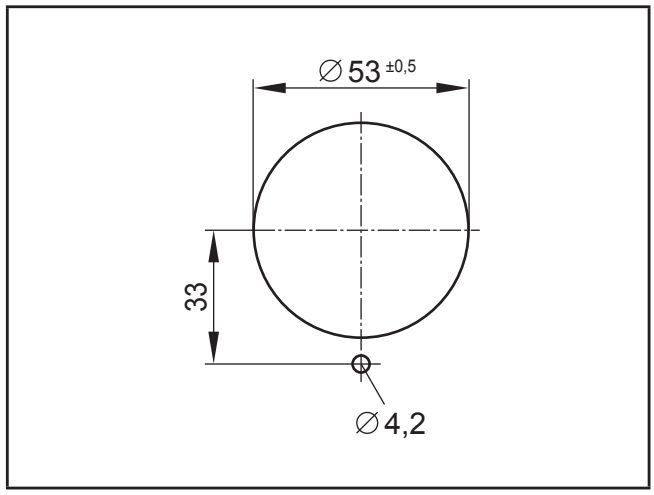
Suitable for material thicknesses up to 3 mm.

- ► Make a round cutout and hole for the locating pins.
- ► Remove the M52 nut from the device.
- ► Insert the device into the cutout.
- ► Screw the M52 nut onto the device and tighten by hand.



Mounting principle

1: M52 nut
2: Control panel
3: BasicDisplay XL



Cutout and hole for locating pins

Surface mounting does not allow for a seal between the device and the panel.

5 Electrical connection

5.1 General electrical connection

Wiring (→ 8 Technical data)

► Connected cables must be provided with a strain relief.

M12 connector: Max. tightening torque 1,5 Nm.

5.2 Fuse

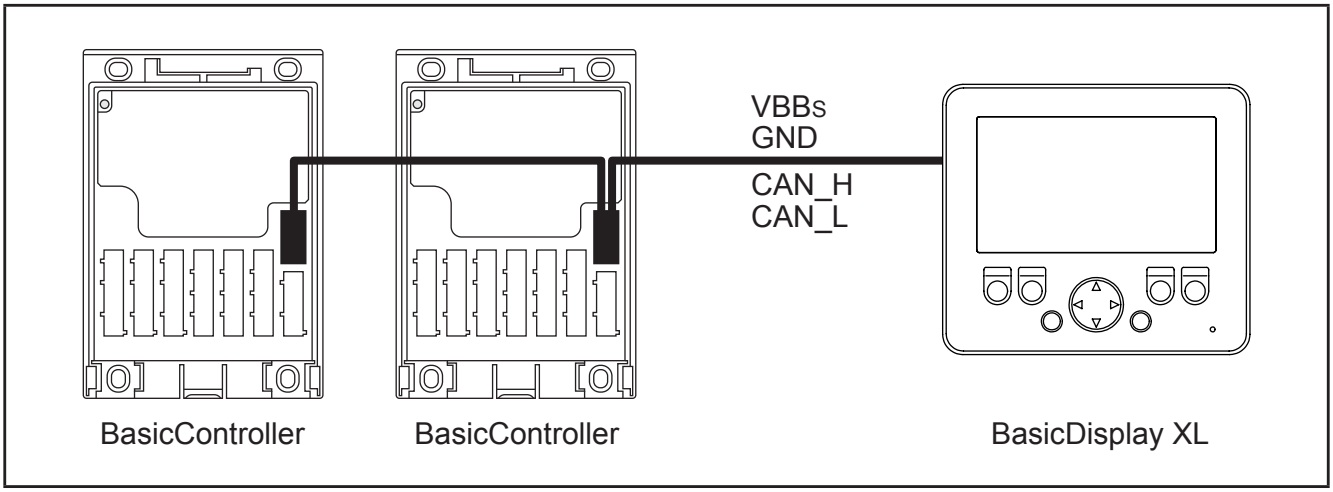
► Protect supply voltage.

Potential	Description	Pin no.	Fuse
VBB $_S$	Supply voltage	2	≤ 2 A time-lag

5.3 Connection accessories

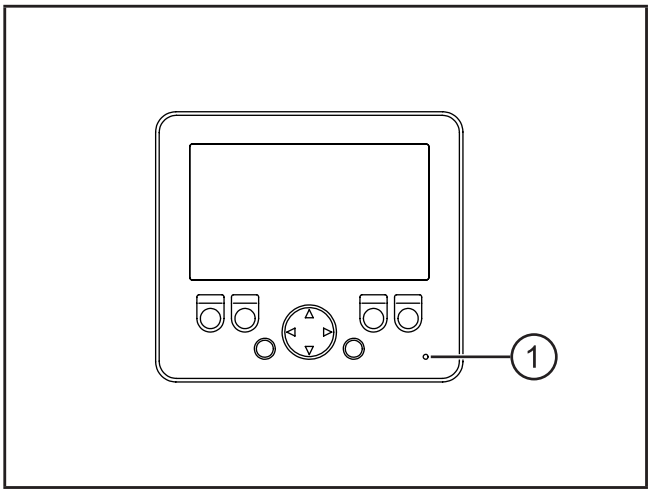
You can find more information about the available accessories at:
www.ifm.com → Data sheet search → e.g. CR0452 → Accessories

5.3.1 Example accessories



Connection cable EC0455

6 Display elements



1: Status LED

Operating states (→ 8 Technical data)

7 Set-up

7.1 Programming

The user can easily create the application software by means of the IEC 61131-3 compliant programming system CODESYS 2.3.

⚠ WARNING

The user is responsible for the safe function of the application programs which he created himself. If necessary, he must additionally carry out an approval test by corresponding supervisory and test organisations according to the national regulations.

7.2 Required documentation

In addition to the CODESYS programming system, the following documents are required for programming and set-up of the device:

- Programming manual CODESYS V2.3
  (alternatively as online help)
- System manual BasicDisplay XL
  (alternatively as online help)

The manuals can be downloaded from the internet:
www.ifm.com → Data sheet search → CR0452 → More information

CODESYS and BasicDisplay XL online help:
www.ifm.com → Service → Download → Systems for mobile machines*

*) Download area with registration

7.3 Required hardware

A CAN interface for the connection to a PC or a notebook is required to load the application program to the device.

Example:

- CAN/RS232 USB interface CANfox (art. no.: EC2112)
- Adapter cable for CANfox (art. no.: EC2113)

You can find more information about the available accessories at:
www.ifm.com → Data sheet search → CR0452 → Accessories
or directly
www.ifm.com → Data sheet search → EC2112

8 Technical data

CR0452

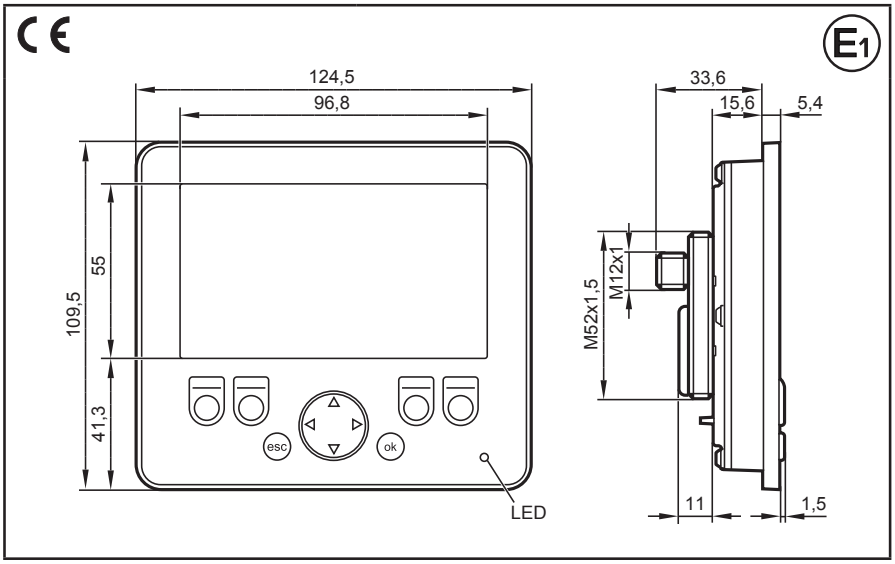
BasicDisplay XL

4.3" colour display

6 freely programmable backlit function keys

Navigation key for cursor function

8...32 V DC



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Technical data	Programmable display with graphic capabilities, can be used with BasicController or as stand-alone display
Display	
Display	TFT LCD colour display, transmissive
Format	95.0 x 53.9 mm (active area), 4.3" diagonal
Resolution	480 x 272 pixels
Aspect ratio	16 : 9
Surface	Polyester film, reinforced with glass (mineral glass) in the visible area of the device
Colours	256 (8 bits)
Background illumination	LED (lifetime ≥ 40,000 h; at 25°C)
Brightness	≥ 400 cd/m², typically 440 cd/m² (adjustable 0...100%, increments 1%)
Contrast ratio	≥ 300:1, typically 450:1
Character sets	Preinstalled: Arial, Lucida Console (fixed font sizes) for further information see the BasicDisplay XL manual www.ifm.com → Data sheet search → CR0452 → More information
Mechanical data	
Dimensions (W x H x D)	124.5 x 109.5 x 39 mm
Cutout for panel mounting (W x H)	114 ± 0.5 x 99 ± 0.5 mm
Cutout for surface mounting (Ø)	53 ± 0.5 mm
Hole for locating pins (Ø)	4.2 mm (33 mm distance to the centre of the cutout)
Housing material	Plastic (black)
Pushbuttons	6 function keys (silicone keyboard) with tactile feedback freely programmable (softkey function) Life cycle ≥ 750,000 activations
Navigation key	Cursor function (up, down, left, right) with tactile feedback Life cycle ≥ 750,000 activations
Background illumination operating elements	LED (brightness adjustable 0...100%, global control)
Protection rating	IP 67 (on the front panel when mounted, otherwise IP 65)
Operating/storage temperature	-20...65° C / -30...80° C
Weight	0.22 kg

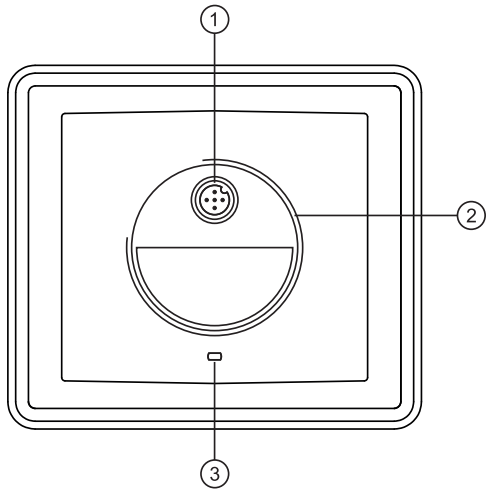
CR0452	Technical data
Electrical data	
Operating voltage	8...32 V DC
Current consumption	100 mA (at 24 V DC; 100% background illumination)
Overvoltage Undervoltage detection Undervoltage shutdown	36 V for t ≤ 10 s at U_B ≤ 7.8 V at U_B ≤ 7.0 V
Processor	Freescale PowerPC 5517E, 50 MHz
Memory (total)	592 Kbytes RAM / 1536 Kbytes Flash / 1 Kbyte MRAM
Memory allocation	See BasicDisplay XL system manual www.ifm.com → Data sheet search → CR0452 → More information
CAN Baud rate Communication profile	CAN interface 2.0 A/B, ISO 11898 20 Kbits/s...1 Mbit/s (default 250 Kbits/s) CANopen, CiA DS 301 version 4, CiA DS 401 version 1.4 or SAE J 1939 or free protocol
Software/programming	
Programming system	CODESYS version 2.3 (IEC 61131-3)
Graphic functions	Via integrated target visualisation
Other features	
Status LED	Two-colour LED (red/green)
Operating states (LED)	

Colour	Status	Description
–	permanently off	no operating voltage
Orange	1 x on	initialisation or reset checks
Green	5 Hz	no operating system loaded
	2Hz	application is running (RUN)
	permanently on	application stopped (STOP)
Red	10 Hz	application stopped (STOP with error)
	5 Hz	application stopped due to undervoltage
	permanently on	system fault (fatal error)

Test standards and regulations		
CE marking	EN 61000-6-2: 2005	Electromagnetic compatibility (EMC) Immunity
	EN61000-6-4 2007 +A1: 2011	Electromagnetic compatibility (EMC) Emission standard
	EN 61010-1: 2010	Safety requirements for electrical equipment for measurement, control and laboratory use
e1 marking	UN/ECE-R10	Emission standard Immunity with 100 V/m
Electrical tests	ISO 7637-2: 2004	Pulse 1, severity level: IV; function state C Pulse 2a, severity level: IV; function state A Pulse 2b, severity level: IV; function state C Pulse 3a, severity level: IV; function state A Pulse 3b, severity level: IV; function state A Pulse 4, severity level: IV; function state A Pulse 5, severity level: III; function state C (data valid for the 24V system) Pulse 4, severity level: III; function state C (data valid for the 12 V system)

UK

CR0452	Technical data	
Climatic tests	EN 60068-2-30: 2006	Damp heat, cyclic upper temperature 55°C, number of cycles: 6
	EN 60068-2-78: 2002	Damp heat, steady state test temperature 40°C / 93% RH, Test duration: 21 days
	EN 60068-2-52: 1996	Salt spray test severity level 3 (motor vehicle)
Mechanical tests	ISO 16750-3: 2012	Test VII; Vibration, random mounting location: vehicle body
	EN 60068-2-6: 2008	Vibration, sinusoidal 10...500 Hz; 0.72 mm/10 g; 10 cycles/axis
	ISO 16750-3: 2012	Bumps 30 g/6 ms; 24,000 shocks
Tests for railway applications	EN 50155-12-2: 2008	Electronic equipment used on rolling stock
	EN 50121-3-2: 2006	Electromagnetic compatibility (EMC)
Back of the unit		



1: M12 connector
2: M52 thread for fixing nut
3: Locating pins

Connection	M12 connector, A-coded, 5 poles

Wiring

Supply, CAN		
	1 2 3 4 5	n.c. 8...32 V DC GND CAN_H CAN_L

9 Maintenance, repair and disposal

9.1 Maintenance

The device does not contain any components that need to be maintained by the user.

9.2 Cleaning the housing surface

► Disconnect the device.
► Clean the device from dirt using a soft, chemically untreated and dry cloth.
► In case of heavy dirt, use a damp cloth.

The following agents are not suited for cleaning the device:
chemicals dissolving plastics such as methylated spirit, benzine, thinner, alcohol, acetone or ammonia.

Micro-fibre cloths without chemical additives are recommended.

9.3 Repair

► The device must only be repaired by the manufacturer.
Observe the safety instructions (→ 2.4 Tampering with the device)

9.4 Disposal

► Dispose of the device in accordance with the national environmental regulations.

10 Approvals/standards

Test standards and regulations (→ 8 Technical data)

The EC declaration of conformity and approvals can be found at:
www.ifm.com → Data sheet search → CR0452 → More information → Certificates