Beijer

ELECTRONICS

M70

Installation Manual

English

M70 Installation Manual

Foreword

The handheld operator panel M70 is a portable operating and display device with rugged design and Windows-CE compatible electronics.

Using a high-performance Intel PXA270 processor and providing a serial interface or Ethernet, the M70 is ideal for a great variety of applications.

The touch screen and graphic elements in color offer intuitive operation.

High safety is ensured by the emergency stop switch and the enabling switch.

Everything for your HMI running

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1   Safety Precautions

Both the installer and the owner and/or operator of the handheld operator panel must read and understand this installation manual.

1.1   General

– Only qualified personnel may install or operate the handheld operator panel.

– The handheld operator panel must be installed according to the installation instructions.

– The handheld operator panel is designed for installation where the following conditions are fulfilled:

  • no high explosive risks

  • no strong magnetic fields

  • no direct sunlight

  • no large, sudden temperature changes

– Never allow fluids, metal filings or wiring debris to enter any openings in the handheld operator panel. This may cause fire or electrical shock.

– The handheld operator panel fulfills the requirements of article 4 of EMC directive 89/336/EEC.

– The handheld operator panel meets the protective class III in accordance with EN61131-2 and EN50178.

– When connecting the handheld operator panel, make sure that all voltages connected to the handheld operator panel are safety extra low voltages and isolated from the low voltage supply system by a safety transformer or a similar facility. All supply circuits connected to the handheld operator panel must be protected with a fuse of a maximum of 3.15 A.

– Storing the handheld operator panel where the temperature is lower/higher than recommended in this manual can cause the LCD display liquid to congeal/become isotopic.

– The LCD display liquid contains a powerful irritant. In case of skin contact, wash immediately with plenty of water. In case of eye contact, hold the eye open, flush with plenty of water and get medical attention.

– The supplier is not responsible for modified, altered or reconstructed equipment.

– Use only parts and accessories manufactured according to specifications of the supplier.

– Peripheral equipment must be appropriate for the application and location.

– The figures in this manual serves an illustrative purpose. Because of the many variables associated with any particular installation, the supplier cannot assume responsibility for actual use based on the figures.

– The supplier neither guarantees that the handheld operator panel is suitable for your particular application, nor assumes responsibility for your product design, installation or operation.

1.2 During Use

– Keep the handheld operator panel clean.

– Do not use too much force or sharp objects when touching the keys, display etc.

– Do not lay the handheld operator panel down with the operating side facing down, since this may cause unintentional activation of the handheld operator panel, or damage the operating elements.

Emergency Stop Button

– Not fully functional emergency stop devices may have fatal consequences! Emergency stop switches which are red-yellow marked must be effective under all circumstances in all operating modes of a machine or plant.

– Store handheld panels with not operational red-yellow emergency stop switches on a place where the operator cannot see it, so that he cannot mistake the device.

– Resetting an activated emergency stop facility must not result in uncontrolled start-up of machines or installations.

– The emergency stop button does not replace other safety facilities.

– The emergency stop button on the handheld operator panel does not replace the emergency stop buttons to be mounted directly on the machine.

– Some mechanical errors in emergency stop switches can be recognized at operation only.

– Test the function of the emergency stop switch if the handheld operator panel has been exposed to mechanical shock (e.g. fallen on the ground).

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Enabling Switch

– The enabling switch is only suitable as safety function if the operator activating the enabling switch recognizes the dangerous situation in time so that he can immediately take the necessary measures to avoid such situations.

– As additional measure reduced speed of the movement can be necessary. The allowed speed must be determined by means of a risk assessment.

– The enabling switch is only used to enable commands for performing dangerous movements. The commands themselves must be activated by a separate operating element (key on handheld operator panel).

– Only the person who operates the enabling switch is allowed to work in the dangerous area.

Note:
The enabling switch is hardware dependent, and are separated from the software running in the operator panel. The panel will function normally, regardless of the status of the enabling switch. See section *Enabling Switch* for information.

1.3   Service and Maintenance

– Only qualified personnel should carry out repairs.

– The agreed warranty applies.

– Before carrying out any cleaning or maintenance operations, disconnect the equipment from the electrical supply.

– Clean the display and surrounding front cover with a soft cloth and mild detergent.

1.4   Dismantling and Scrapping

– The handheld operator panel or parts thereof shall be recycled according to local regulations.

– The following components contain substances that might be hazardous to health and the environment: electrolytic capacitor and display.

2 Hazard and Risk Analysis

For manual control of machines in special operating modes, where safety depends on the timely reaction of the operating staff, it is absolutely essential that the operator can overlook the operating area.

The handheld operator panel has the advantage that the operator can get very close to the control panel. At the same time, the danger of misuse increases with mobility since, in remote locations where it is not possible to observe the operating area, machine movements can also be set in motion with the handheld operator panel, knowingly or unknowingly. The machine operator has to find the right compromise between necessary flexibility and a reasonable limitation of the working range when selecting the cable length for the handheld operator panel.

If the machine or equipment is operated with the handheld operator panel, care must be taken at this time to ensure that operation can only be controlled by the handheld panel and cannot be operated from any other point on the equipment. The hazard zone may only be entered by the person who is operating the handheld panel. If it should be necessary for more than one person to work in the hazard zone at the same time, each person present requires an enabling device and machinery movement may only be allowed after all the enabling devices have been activated.

For the right projecting of the handheld operator panel, a hazard and risk analysis must be carried out. In addition to chapter *1 Safety Precautions*, the following safety aspects is to be considered:

– Which is the correct cable length for limitation of work space?

– Is an emergency stop button necessary and permissible?

– Is the safety category for the application sufficient?

The handheld operator panel may be operated in faultless condition only and the operating instructions must be observed.

Moving around with a cable connected device also requires consideration. To avoid damage to the cable or the cable sheath, the cable must not be squeezed or laid over sharp edges.

See also chapters *5 Emergency Stop* and *6 Enabling Switch*.

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3   Description of Parts

Key switch

Emergency stop switch

USB memory stick
protection cover

Touch stylus
(integrated in housing)

4 function keys

Color display with touch
screen

Power LED

4 function keys

4 function keys

Two 3-position enabling
switches, twin circuit

Multigrip handle

Cable entrance area

Strain relief and bend protection
for connection cable

Blind plug for cable outlet not used
(to meet protection degree IP 65)

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4 Connection

4.1 Cable Entrance Area

Summer

USB-Client (S12)

Dip switches
Configuration RS-422-A or RS-232-C
(default RS-422-A but only RS-232-C
is supported)

RS-232-C (S11)
for data exchange

ETHERNET (S4)
for data exchange

Serien-Art.-Nr. Etikett

Main Plug (S22)
Powersupply,
Enabling device,
E-Stop

Reset button
Restarts device.
All unsaved data will be lost

Strain Relief of Cable
for connecting cable
(on left or right side).
ATTENTION:
Use blind plug on
cable outlet not used.

Sealing Plug
Must be used
to ensure
impermeability!

Note:
When the cable entrance area is open, the M70 is sensitive to electrostatic discharge.

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Cable Routing in Cable Entrance Area

Cable routing makes it possible to adapt the M70 to suit either a right- or left-handed user better.

After opening the cable entrance area, the connecting lines can be routed as described in the following section. Before opening the M70 please pay attention to the safety instructions below.

Instructions for opening the cable entrance area:
– Place the M70 with the display facing down onto a plane and clean table (preferable on ESD pad) and take care not to damage the M70 and its operating elements.

– For opening and closing the cable entrance area a Phillips size 2 screwdriver is used.

Instructions for modifications in the cable entrance area:
– Unplug the main connector (S22) by pulling on its wires with your fingers. Do not use any sharp objects.

– For unplugging the RJ-45 jack (S11or S4), actuate the locking lever:
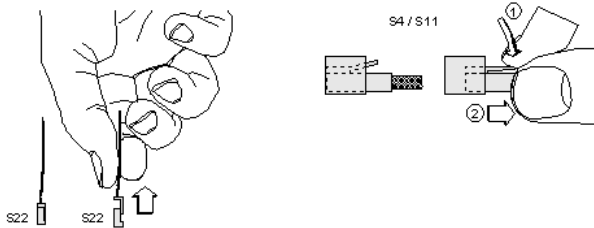
Make sure that the connectors S22 and S4 / S11 correctly snap in when you plug them in. Otherwise the emergency stop functionality (S22) or the correct shielding (S4 / S11) might not be given anymore.

Instructions for closing the cable entrance area:
– Make sure that the sealing is clean, not damaged and correctly positioned in the cable entrance area.

– Make sure that no cables are squeezed in.

– Make sure that the cover of the cable entrance area is attached again with all 6 screws (torque: 0.4 - 0.5 Nm).

Otherwise the protection degree cannot be guaranteed.

4.2   RS232C Connection

The serial interface is used as an RS232C interface. The dip switches has to be set according to below for RS232C communication:

B4   B5   B3   B2

The COM-SIO connector S11 in the cable entrance area of the M70 is used.

Note:
The RS232C connection cannot be used simultaneously with an Ethernet connection.

4.2.1   RS232C Wiring Diagram
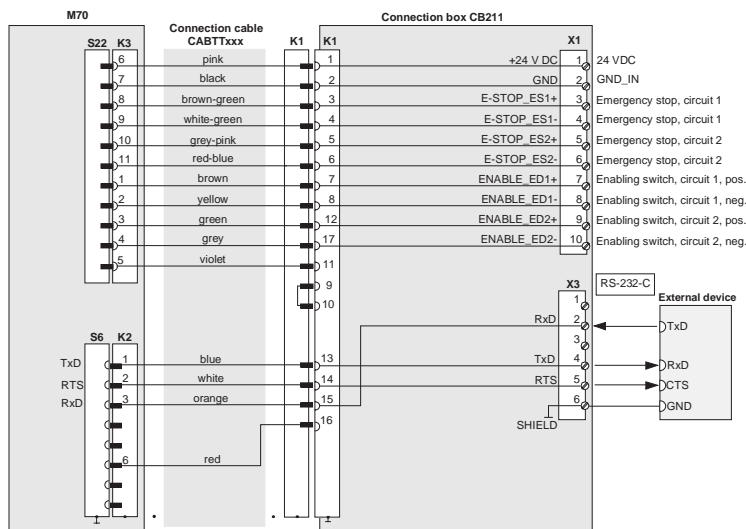
4.2.2 RS232C Cable Outlet

The drawing below illustrates the cable outlet when the RS232C interface is used.

right   left
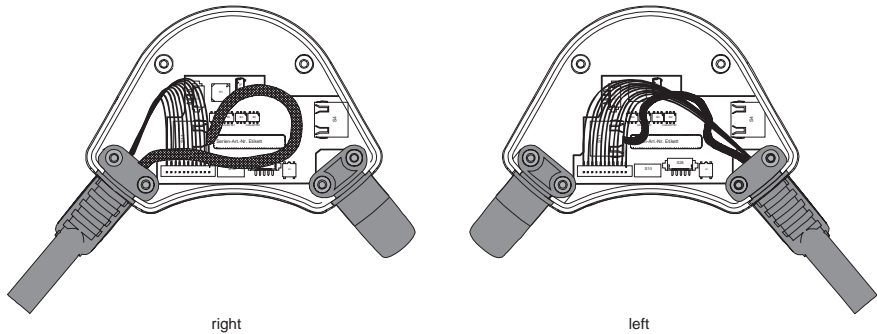
4.3   Ethernet Connection

The M70 is equipped with an Ethernet interface based on the 10 Base T specification and suitable for half-duplex mode.

The Ethernet connector S4 (marked ETHERNET) in the cable entrance area of the M70 is used.

The following interface parameters are defined and cannot be changed:

– 10 Mbit/s

– TCP/IP protocol

If the M70 and the control do not communicate via a point-to-point connection, it may happen that the keypad data, for example, are transmitted with a delay. To avoid this, it is advisable to establish the connection via an Ethernet switch which enables a point-to-point connection.

The positions of the dip switches in the cable entrance area are not relevant for this interface.

Note:
The Ethernet connection cannot be used simultaneously with an RS232C connection.

4.3.1 Ethernet Wiring Diagram
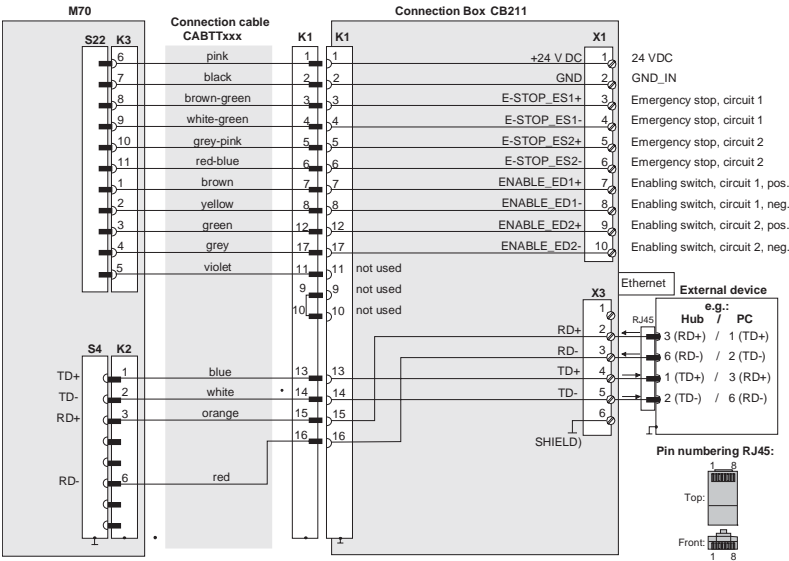
4.3.2 Ethernet Cable Outlet

The drawing below illustrates the cable outlet when the Ethernet interface is used.

right   left

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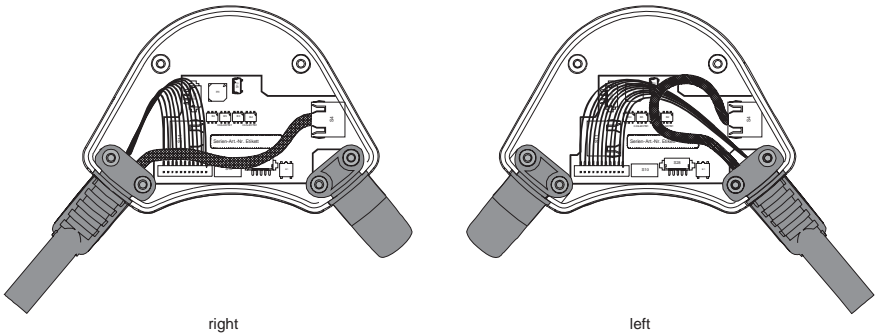
5 Emergency Stop

Not fully functional emergency stop devices may have fatal consequences! Emergency stop switches which are red-yellow marked must be effective under all circumstances in all operating modes of a machine or plant.

The emergency stop switch used on the M70 features two circuits. The contacts are normally closed.

The emergency stop switch of the M70 meets the requirements of the EN 418. It must be designed as an emergency stop of category 0 or category 1 (see EN 60204-1) on the basis of the risk assessment for the machine. The connection of the positive-break contacts to an appropriate monitoring system must meet the safety category which is defined by means of the risk assessment (in accordance with EN 954-1) of the machine.

Please see chapter *1 Safety Precautions* for safety precautions regarding the emergency stop switch.

Note for maintenance:
The emergency stop switch must be tested cyclic (every 6 months). Watch the machine stopping after the emergency stop switch had been pushed.

The manufacturer guarantees a lifetime of > 50,000 switching cycles.

See also chapter *2 Hazard and Risk Analysis*.

6   Enabling Switch

The M70 is equipped with two enabling switches, one at the left and one at the right side of the device. This allows a left- and right-hand operation of the enabling switch. Both enabling switches are equivalent and parallel switched, which means that for enabling, only one of both enabling switches must be activated.

Note:
The enabling switches are hardware dependent, and are separated from the software running in the operator panel. The panel will function normally, regardless of the status of the enabling switches.

Please see chapter *1 Safety Precautions* for safety precautions regarding enabling switches.

The enabling switch consists of a 3-position operating element and an separated evaluation electronics. An essential feature are the continuous two-channel circuits beginning from the actuating elements up to the connecting terminals. For the evaluation circuits different technologies and circuits are used. Due to the electronic switching contacts, their lifetime does not depend on the load provided the nominal values of the load (ohmic, inductive and capacitive) are not exceeded.

The switching elements of the enabling switches are protected against reversed polarity. The outputs of both circuits are protected against short circuits and overload.
Circuit 1: thermal protective circuit
Circuit 2: fold back line

The actuating element consists of two symmetrically arranged slides. The position of these slides is detected by electrical switches and transmitted to the evaluation electronics.

Positions of enabling switch:

Position	Function	Enabling switch	Contacts
1	Home position	Not pressed	Enabling outputs are open
2	Enabling	Pressed	Enabling outputs are closed
3	Panic	Pressed strongly	Enabling outputs are open

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6.1 Examples of Connecting the Enabling Switch to Hardware

Connection with PILZ PST1 Control Relay
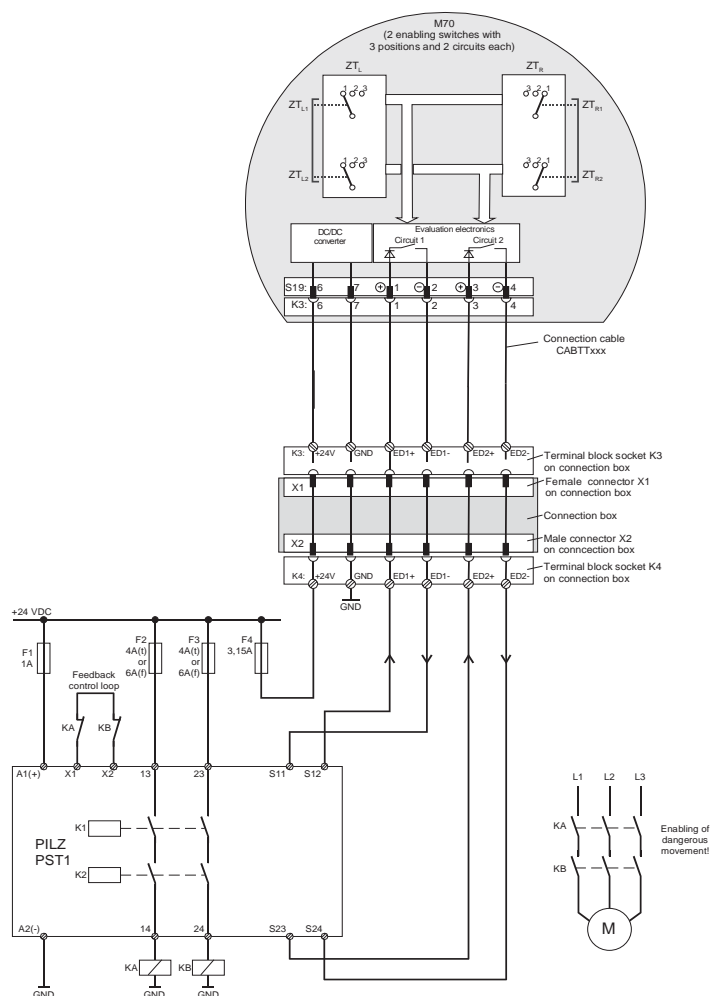
Note: All contacts of KA and KB must be forced-guided!

Connection with ELAN SRB-NA-R-C.27/S1 Control Relay

Notes: 1) All contacts of KA and KB must be forced-guided.
        2) S4 and S1 on the rear side of the component must be set to the position 0.
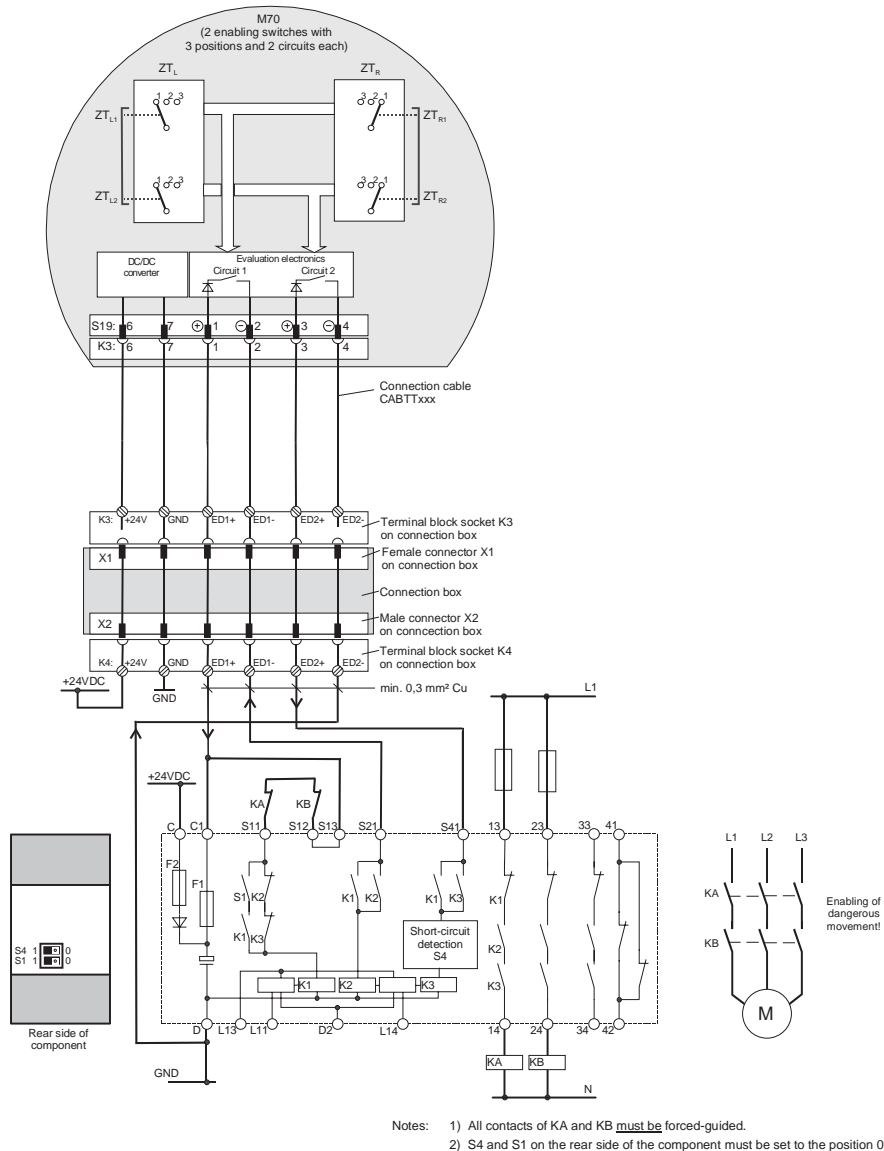
See also chapters *2 Hazard and Risk Analysis* and *14.4 Pin Description of X1 Terminal Block*.

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7   Touch Screen

The touch screen is to be operated with a finger or with the included touch stylus. Never use sharp objects, such as a screwdriver, for operating the touch screen.

The touch screen is already calibrated when the M70 is delivered.

If a recalibration is required for any reason (humidity of air, temperature, etc.), turn the key to the left, and follow the instructions on displayed on the screen.

It is also possible to use the Service Menu for calibration. See section *8.2 Service Menu*.

7.1   Screen Saver

To extend the lifetime of the background lighting the screen saver is activated after 15 minutes.

It is possible to set a different screen saver activation time, or to disable it, under **Setup/Terminal Options** in the configuration tool for the operator panels.

Note:
The screen saver does not make the screen totally dark; it is still possible to see objects on the screen. When the screen saver is activated, the screen has to be touched once in order to inactivate the screen saver and to receive operator input.

Note:
The Dim back register (available from **Setup/System Signals** in the configuration tool for the operator panels) cannot make the display of the M70 totally dimmed.

---

8 Key Switch

The key switch can be set in three positions.

Key switch position	Function
Left	Enables touch screen calibration
Center	Normal use
Right	Opens the service menu

8.1 Touch Screen Calibration

The left-hand key switch position can be used if the touch screen has lost its orientation or if the Service menu for some reason is unavailable. Follow the instructions on the screen to calibrate the touch screen.

8.2 Service Menu

The right-hand key switch position opens the **Service Menu**.

8.2.1 Network Settings

Select the **Network Settings** option to make settings for TCP/IP, network services (SMTP client) and network accounts (also available from the configuration tool for the operator panels).

8.2.2 Erase Project Memory

This option erases the project memory.

8.2.3 Update System Program from Memory Card

Insert a USB memory stick with a new system program and follow the instructions. The system program can also be updated via the configuration tool for the operator panels.

Note:
The M70 requires a *.cab file of another type than other operator panels in the same series. The *.cab files for the other panels may not be used in the M70.

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8.2.4 Calibrate Touch Screen

Follow the instructions on the screen to calibrate the touch screen. See also *8.1 Touch Screen Calibration*.

8.2.5 Update Image

Select the **Update Image** option to open up the ImageUpdate tool.
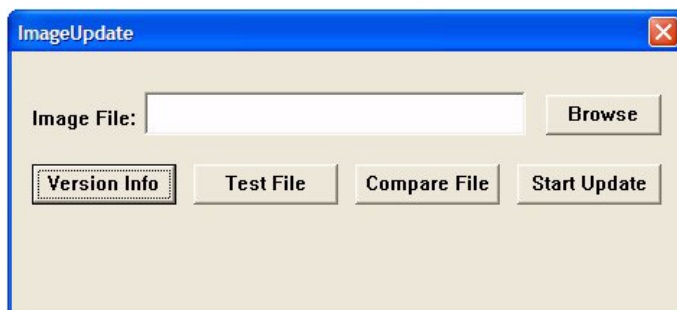
Insert a USB memory stick with a new image (*.bin file). The buttons have the following functions:

Browse
Select the image file. **Hard Disk drive** represents the USB memory stick.

Version Info
Presents the image version number of the installed image, and the image version number of the selected file.

Test File
Checks the selected file for validity.

Compare File
Compares the selected file with the installed image.

Start Update
Starts the image update. The progress status is displayed in a progress bar.

Note:
Do not remove the power or the USB memory stick from the panel during the up-date.

After a completed update, the panel is automatically restarted.

9   USB Memory Sticks

The USB connector is located under a protection cover on the M70.

Note:
The protection degree IP 65 is not guaranteed while the protection cover is open.

9.1   Connecting a USB Memory Stick

Follow the steps below to connect a USB memory stick:

1. Open the protection cover.

2. Plug in the USB memory stick until it snaps.

The USB memory stick will be detected immediately.

Never unplug the USB memory stick during read/write operations.

After removing the USB memory stick, the protection cover must be closed completely to obtain the IP 65 protection degree.

9.2   Recommended USB Memory Sticks

The following USB memory sticks have been tested and are recommended for the use in the M70:

Manufacturer	USB stick	Type	Size
Kingston	Kingston Data Traveler	USB 2.0	128 MB or more
Transcend	Transcend JetFlash	USB 2.0	128 MB or more

USB memory sticks from other manufacturers have not been tested, and can cause problems.

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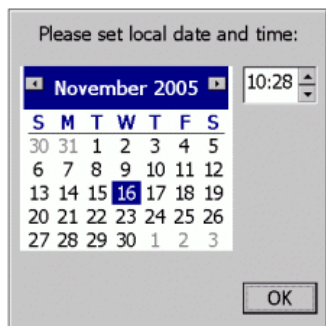# 10   Configuration Tool for the Operator Panels

The M70 panel project is configured using the configuration tool for the operator panels. Function keys, touch keys and a number of other objects, as well as panel settings, are available in the configuration tool. Please see the reference manual for the configuration tool for information. Not all functions in the configuration tool are supported by the M70.

11 Start-up Procedure

Perform the following steps when starting the M70.

1. Connect the cables for RS232C or Ethernet communication.

2. Connect the M70 to the power supply.

3. A dialog for setting of date and time is displayed.

```
Please set local date and time:

 ◄  November 2005  ►      10:28 ▲▼

  S   M   T   W   T   F   S
 30  31   1   2   3   4   5
  6   7   8   9  10  11  12
 13  14  15  16  17  18  19
 20  21  22  23  24  25  26
 27  28  29  30   1   2   3

                          OK
```

4. If time and date are of importance of the application, set date and time, and click **OK**. See section *11.1 Date and Time Handling in the M70*.

5. Wait for the dialog to disappear (regardless if date and time were set or not).

6. The system program will start in approximately 40 seconds, and the application is ready to use.

11.1 Date and Time Handling in the M70

Date and time are not stored in the M70, since the real time clock has no battery backup. If date and time are of importance in the application, for example to log data or for trends, they have to be set every time the M70 is turned on.

If date and time are not set at start-up, M70 will start with default values.

To set the clock during runtime, a maneuverable clock object can be included in the panel project.

12 Technical Data

M70 specifications

Parameter	M70
Size, diameter height (incl. handle)	250 mm 114 mm
Seal	IP65 (when USB host cover is closed).
Keyboard material	Membrane keypad with tactile feedback.
Front panel	Touch screen: Polyester on glass, 1 million finger touch operations.
Housing	Double-walled ABS housing. Withstands grease, oil, lubricants, alcohol, etc.
Flammability class	UL 94-V0
Weight	1.25 kg (incl. emergency stop and key switch, excl. cable)
Serial port RS232C	9-pin D-sub contact, male with standard locking screws 4-40 UNC.
Ethernet	10 Mbit/s
USB	USB 1.1 host interface USB 1.1 client interface
Flash memory for application	64 MB
Real time clock	Without battery backup
Power consumption at rated voltage	9.6 W (400 mA at 24 V DC) Normal: 0.4 A Maximum: 0.9 A
Display	TFT-LCD. 640 x 480 pixels, 64K color. Analog-resistive touch screen. Background lightning: 2 CCFT cold cathode tubes with 50,000 h lifetime at 25 °C in continuous operation.
Active area of display, W x H	6,5" (132x 98 mm)

Parameter	M70
Power supply	+24 V DC (voltage tolerance 19.2 - 30 V DC according to EN 61131-2). CE: The power supply must conform with the requirements for SELV or PELV according to IEC 950 or IEC 742. UL: The power supply must conform with the requirements for class II power supplies.
Key switch	3 positions - internal connection
Ambient temperature	0 ° to +50 °C
Storage temperature	-20 ° to +70 °C
Relative humidity	5 - 95% non-condensed
Vibration resistance (operation)	10 Hz ≤ f < 57 Hz with 0.15 mm 9 Hz ≤ f < 150 Hz with 2 g (IEC 60068-2-6)
Shock resistance (operation)	25 g / 11 ms (IEC 60068-2-27)
EMC tests on the operator panel	EC Council Directive relating to machinery 98/37/EC and its amendment 98/79/EC: EN 418 EN 954-1 EN 60204-1 EC Council Directive relating to electromagnetic compatibility 89/336/EEC and its amendments 92/31/EEC and 93/68/EEC: EN 61131-2
UL	UL508, UL1740

Additional emergency stop switch specifications

Parameter	Emergency stop switch
Connection	Twin circuit - external connection
Rated voltage	24 V DC
Min. current	10 mA (each contact)
Max. current	1000 mA (each contact)
Utilization category	DC-13 (in accordance with IEC 60947-5-1)

Additional enabling switch specifications

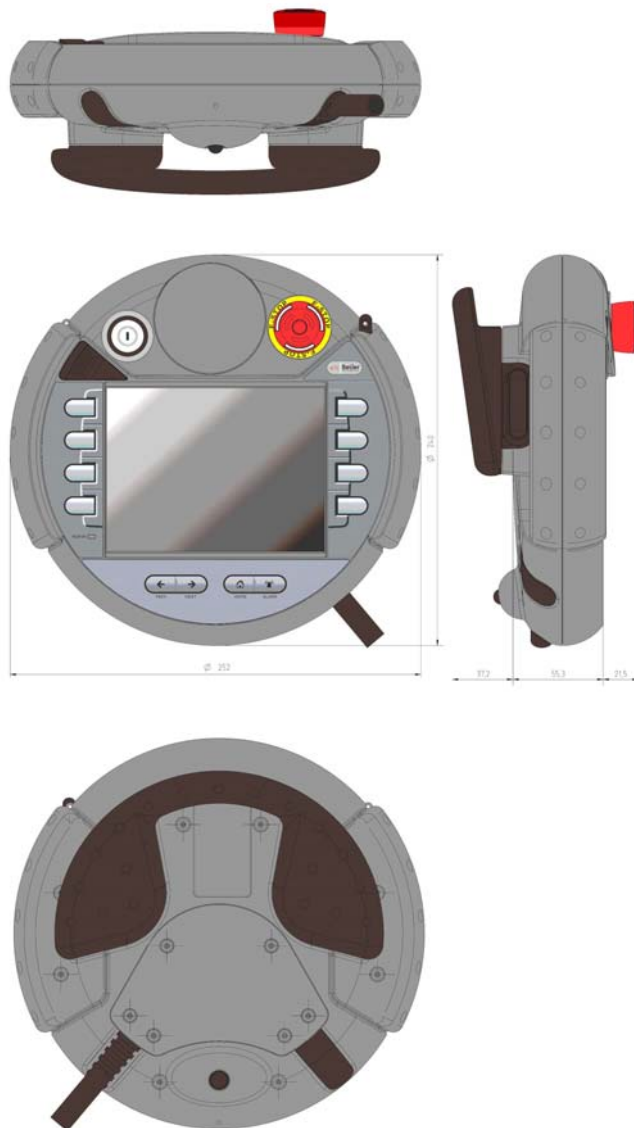The M70 has two 3-position enabling switches.

Parameter	Enabling switch	
Connection	Twin circuit - external connection	
Output type	Solid-state output	
Rated voltage	24 V DC (voltage tolerance 19.2 V DC to 30 V DC according to EN 61131-2)	
Rated current	500 mA (max.)	
Max. current up to output cutoff	Circuit 1	1.5 A
	Circuit 2	0.8 A
Max. inductive load	Circuit 1	145mJ / 1.16 H @ 24 V DC, 500 mA (comparable with DC13 according to EN 60947-5-1)
	Circuit 2	145mJ / 1.16 H @ 24 V DC, 500 mA (comparable with DC13 according to EN 60947-5-1)
Reverse polarity protection	Circuit 1	Yes
	Circuit 2	Yes
Short circuit and overload protection	Circuit 1	Yes (by integration in output-FET)
	Circuit 2	Yes (by protective circuit)
Operating cycle	2nd position	105
	3rd position	5 x 104
Actuating force	From 1st position to 2nd position 5 N typically From 2nd position to 3rd position 20 N typically	

Cable specifications of CABTTxxx connection cable

When planning the power supply, take into account the voltage drop on the M70 connection cable.

Parameter	CABTTxxx
Specification of power supply lines in CABTTxxx	Cross section: AWG24 (0.24mm²) Material: zinc-coated copper strand Line resistance:= 90 Ohm/km (= 145 Ohm/mile)
Nominal supply voltage directly on the handheld panel (without CABTTxxx)	+24 V DC (fully operational in the range: 19.2 - 30 V DC).
Maximum interruption time of supply voltage	≤ 10 ms (lt. IEC 61131)

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13   Outline Drawings

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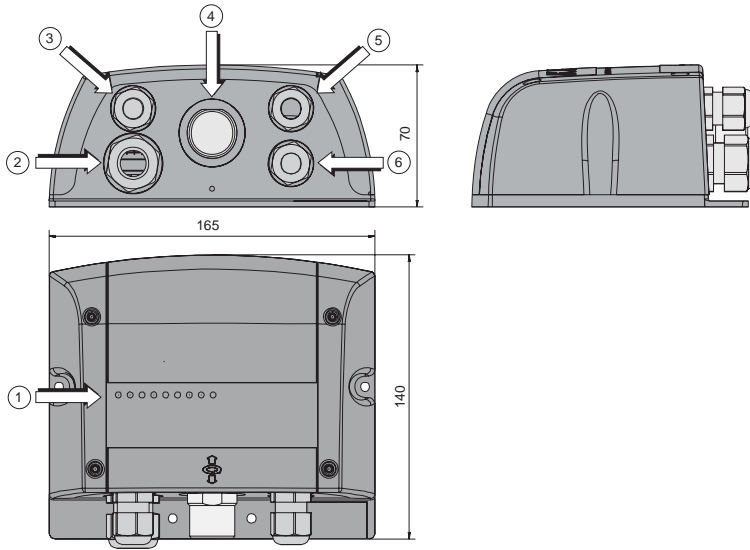✉ sales@vicpas.com
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14 Connection Box

The connection box CB211 is used for integration of the M70 in the machine/ system. It is suitable for wall mounting.

The connection box is described below:

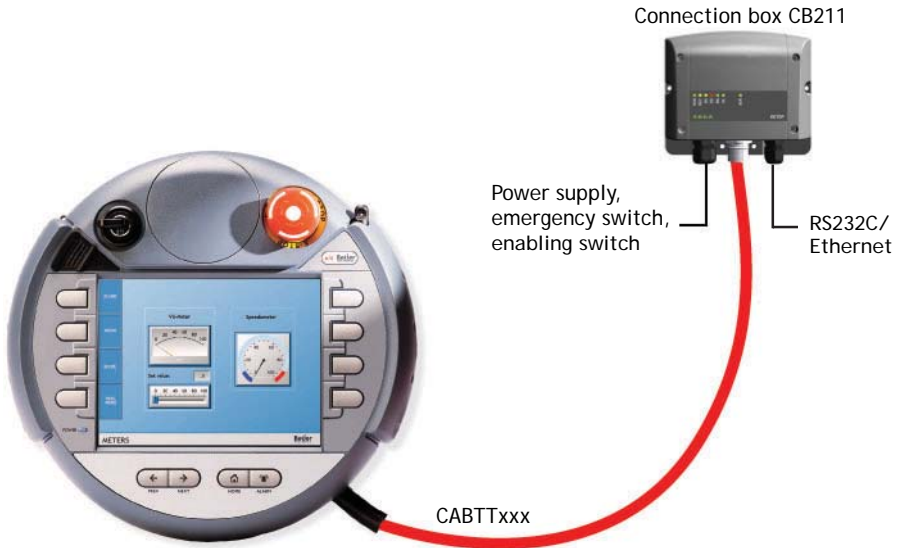| Parts of connection box, numbers according to drawing above			
1	Status and error LEDs	4	Coninvers female connector for M70 connection cable
2	PG gland (M20) for voltage supply, enabling switch and emergency stop	5	PG glands (M16)for data lines
3	PG gland (M16) for separate functional ground (status as supplied with dummy plugs)	6	PG glands (M16) for data lines (status as supplied with dummy plugs)

14.1 Technical Data of Connection Box

Parameter	Connection Box CB211
Rated supply voltage	24 V DC (voltage tolerance 19.2 V DC to 30 V DC according to EN 61131-2)
Maximum interruption time of supply voltage	≤ 10 ms (lt. IEC 31131)
Power consumption with M70 without M70	3.6 W (150 mA at 24 V DC) 10.8 W (450 mA at 24 V DC)
Inrush current	Max. 5.6 A (by implemented inrush current limiter)
Protective class	Class III equipment (in accordance with EN 61131-2 and EN 50178)
Housing construction	Double-walled ABS housing Withstands grease, oil, lubricants, alcohol, etc.
Flammability class	UL94-V0
Dimensions, W x H x D	160 x 140 x 70 mm
Weight	0.5 kg
Protection degree	IP65
Display	Status LEDs
Operating temperature	0 °C to 50 °C
Storage temperature	-20 °C to +70 °C
Relative humidity	5% to 95% non-condensed
Vibration resistance (operation)	5 < f < 9 Hz 7 mm 9 < f < 150 Hz 2g (IEC 60068-2-6)
Shock resistance (operation)	15 g / 11 ms (IEC 60068-2-27)

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14.2 Connecting M70 to Connection Box

Connection between the M70 and the connection box is made according to the illustration below.

Connection box CB211
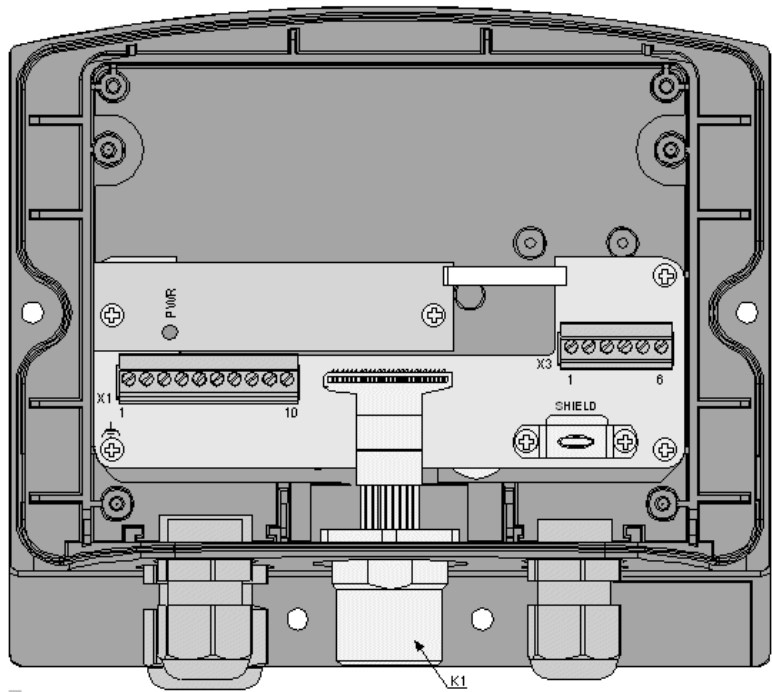

Power supply, emergency switch, enabling switch

RS232C/ Ethernet

CABTTxxx

Minimum Bending Radius of Cable

The drawing below shows the minimum distance required outside and inside the control cabinet.

min. 130 mm / 5.118 in

K1
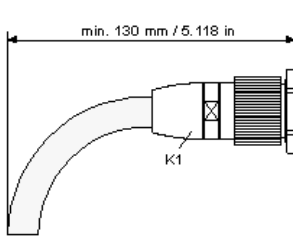
14.3 Interior View of Connection Box

Parts of connection box, marking according to drawing above			
K1	17-pin female connector (Coninvers) for CABTTxxx connection cable	X3	Terminal block for data lines
X1	Terminal block for power and control lines (enabling switch and emergency stop)	SHIELD	Cable shield clamp with connection surface for cable shield of data lines (not used for strain-relief of the cable!)

14.4 Pin Description of X1 Terminal Block

Pin 1	24 V DC	Pin 6	Emergency stop, circuit 2
Pin 2	GND_IN	Pin 7	Enabling switch, circuit 1, pos.
Pin 3	Emergency stop, circuit 1	Pin 8	Enabling switch, circuit 1, neg.
Pin 4	Emergency stop, circuit 1	Pin 9	Enabling switch, circuit 2, pos.
Pin 5	Emergency stop, circuit 2	Pin 10	Enabling switch, circuit 2, neg.

For connection details such as Ethernet and RS232C wiring diagrams, see chapter *4 Connection*.

14.5 Technical Data of the Connection Terminals

The following technical data apply to the X1 and X3 connector terminal blocks already available in the connection box:

Parameter	Connection box
Connection capacity rigid flexible wire gages	0.14-1.5 mm² 0.14-1.5 mm² 28-16 AWG
Connection capacity flexible with wire end ferrules without plastic sleeve with plastic sleeve	0.25-1.5 mm² 0.25-0.5 mm²
Grid dimension	3.81
Insulation length	7 mm²
Tightening torque	0.22-0.25 Nm

PHOENIX Order Data

Gateway terminal block	PHOENIX type	Part no.
X1	MCVR 1.5/6-ST-3.81	1827169
X3	MCVR 1.5/7-ST-3.81	1827172
X4, X4B	MCVR 1.5/10-ST-3.81	1827208

Note:
Consider the connection capacity of the terminal blocks when selecting connection cable.
Multi-line connections (2 wires in one terminal) are not allowed. Use the X4B terminal block for continuing the field bus.

A screwdriver with the following specifications are used to connect the wires to the terminal blocks:

– Blade: 0.4 x 2.5 x 80 mm

– Length: 160 mm

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15   Cables and Accessories

Cables and wall mounting kit can be ordered from the M70 supplier.

15.1 Connection Cable

The following cables are available for connection between the M70 and the connection box:

– CABTT50 (5 m)

– CABTT100 (10 m)

– CABTT150 (15 m)

15.2 Wall Mounting Kit

– WB095