

Technical Manual Interlock Control System

You can find the current version of our manual on our website under «Downloads»:
<https://en.dictator.de/products/interlock-control-systems/peripheral-system/>

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Basic Manual

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Additional Information

Programming of RFID Terminals

<input type="checkbox"/> Detailed programming instruction	RFID01-06
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Connection of Locking Devices

<input type="checkbox"/> Bar magnet	V01
<input type="checkbox"/> Electric strike Roureg 3	V02
<input type="checkbox"/> Electric strike for escape doors AA332.80-F91	V03
<input type="checkbox"/> Electric strike for fire protection escape doors	V04
<input type="checkbox"/> Electric strike for swing doors	V05

Connection of Doors in Escape Routes

<input type="checkbox"/> Emergency exit terminal	ElfVTR01/02
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Other Additional Controls and Advices

<input type="checkbox"/> Connection of time control unit	ZM01/02
<input type="checkbox"/> Connection of door operators	TA01/02
<input type="checkbox"/> Global Emergency-Open	GNA01
<input type="checkbox"/> Discretion Circuit	Diskr01
<input type="checkbox"/> Mounting of cover prepared for a lead seal	PH01
<input type="checkbox"/> Jumper "Plus" control terminal	Plus01/02/03

Safety Instructions



The installation and operation of electric interlock control systems is subject to the relevant legal stipulations for the installation and operation of electric installations. They have to be maintained and if necessary controlled by a person instructed by the manufacturer.

Before opening covers or disassembling components of the interlock control system these have to be separated from the power line, i.e. the power packs have to be isolated electrically!

The power supply has also to be interrupted before all adjusting and connection works on components of the system, i.e. the power pack(s) have to be isolated electrically.

In case there are to be integrated components provided by the customer (e.g. access control systems, locking systems, large surface switches etc.) it has to be checked with DICTATOR in advance if these devices meet the relevant requirements.

Before placing the system into operation, check if all screw and plug connections are firmly tightened/attached.

Establishing the "Programming Matrix"

Listing of the Required Dependencies of the Doors

1. step: Number the doors of the interlock system consecutively.

2. step: In the following table there is noted for every door of the interlock system which other door(s) of the system have to be locked when the respective door is open.

Example: When door 1 is open the doors 3 and 5 have to remain locked. All other doors of the interlock system are free, i.e. they could be opened. Therefore for door 1 is entered in the column "Doors that then have to remain locked" only no. 3 and 5.

Door open (basis door)	Doors that then have to remain locked
Door 1	
Door 2	
Door 3	
Door 4	
Door 5	
Door 6	
Door 7	
Door 8	

3. step: Enter the dependencies of the above table in the matrix below. The codes to be entered (see "legend" below on the left) are also the required positions of the DIP switches of the control terminal which is installed in the corresponding basis door. *Following the above example the programming of the DIP switches of door 1 would be as follows:*

DIP switches door 1: + 0 - 0 - 0 0 0

Matrix to Determine the Positions of the DIP Switches

Legend:

- +** Defines the door for which the dependencies are set (basis door).
- This door is locked when the basis door is open.
- 0** This door may be opened even when the basis door is open.

Door number Number of basis door	Permissible state of the other doors of the interlock system depending on the open basis door							
	1	2	3	4	5	6	7	8
1	+							
2		+						
3			+					
4				+				
5					+			
6						+		
7							+	
8								+

"Programming" the Control Terminals

Adjusting the Values of the Matrix (see previous page)

By default all 8 DIP switches (see marked area in the diagram below) are in the middle position **0**.

First you should **mark** every control terminal with the **number of the door** it is intended for. There is enough space for this e.g. on the round yellow label.

Then the DIP switches are brought to the positions determined for this door number.

Example: It is the control terminal for door 1. In total the interlock control system comprises 5 doors. When door 1 is open, doors 3 and 5 have to be locked, doors 2 and 4 are irrelevant for door 1.

Door number Number of basis door	Permissible state of the other doors of the interlock system depending on the open basis door							
	1	2	3	4	5	6	7	8
1	+	0	-	0	-	0	0	0

IMPORTANT:
The interlock control system has to be electrically isolated before any works on the control terminals are performed.

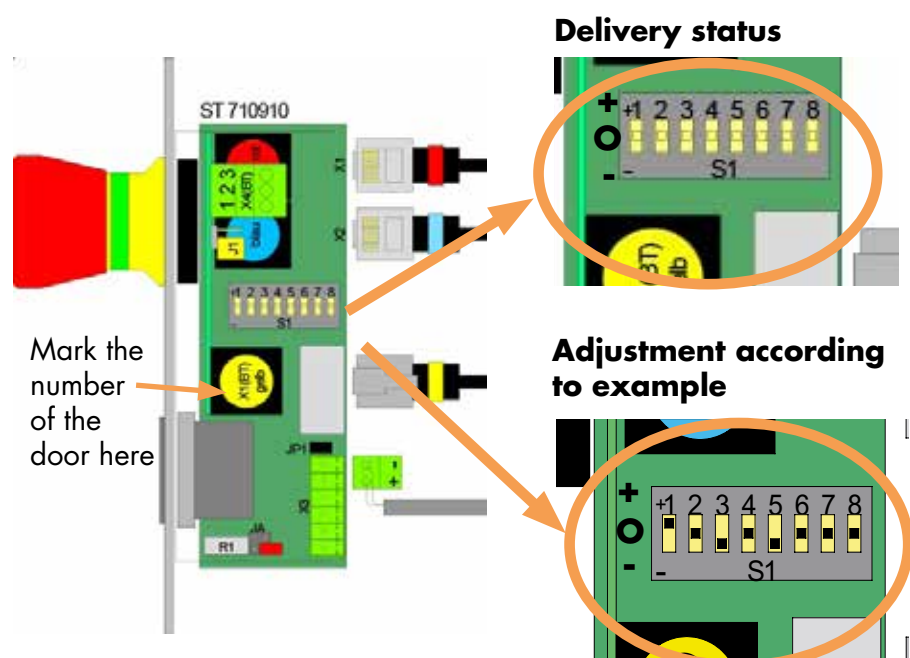


Therefore DIP switch 1 is turned up to the position +, the DIP switches 3 and 5 are turned down to the position - and the DIP switches 2 and 4 remain in the position 0. The free DIP switches 5 - 8 (not assigned to a door) remain in the position 0, too.

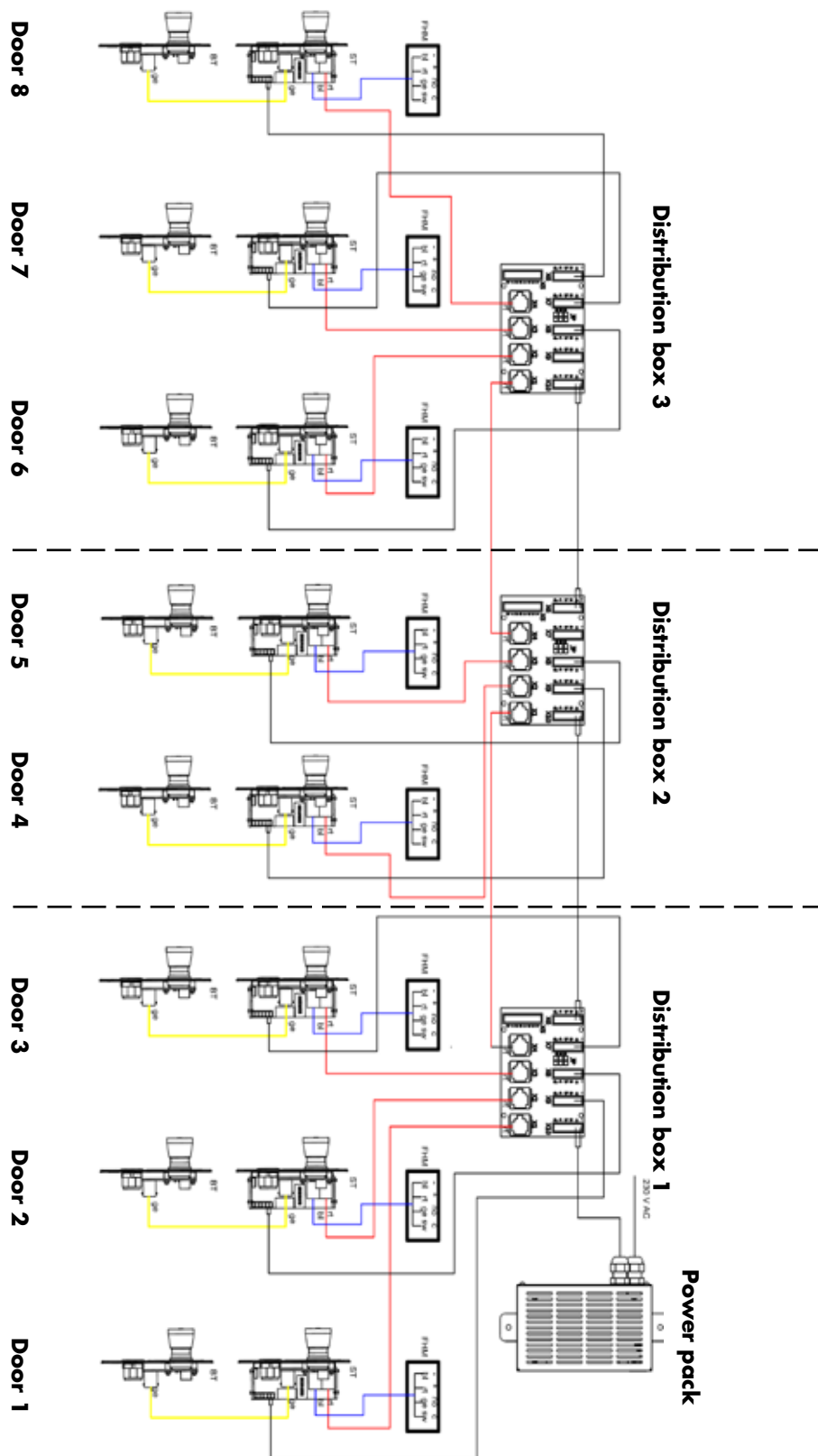
IMPORTANT (especially with modifications): To memorise the new settings the whole system has to be switched off and then turned on again.

Legend:

- +** Defines the door for which the dependencies are set (basis door).
- This door is locked when the basis door is open.
- 0** This door may be opened even when the basis door is open.

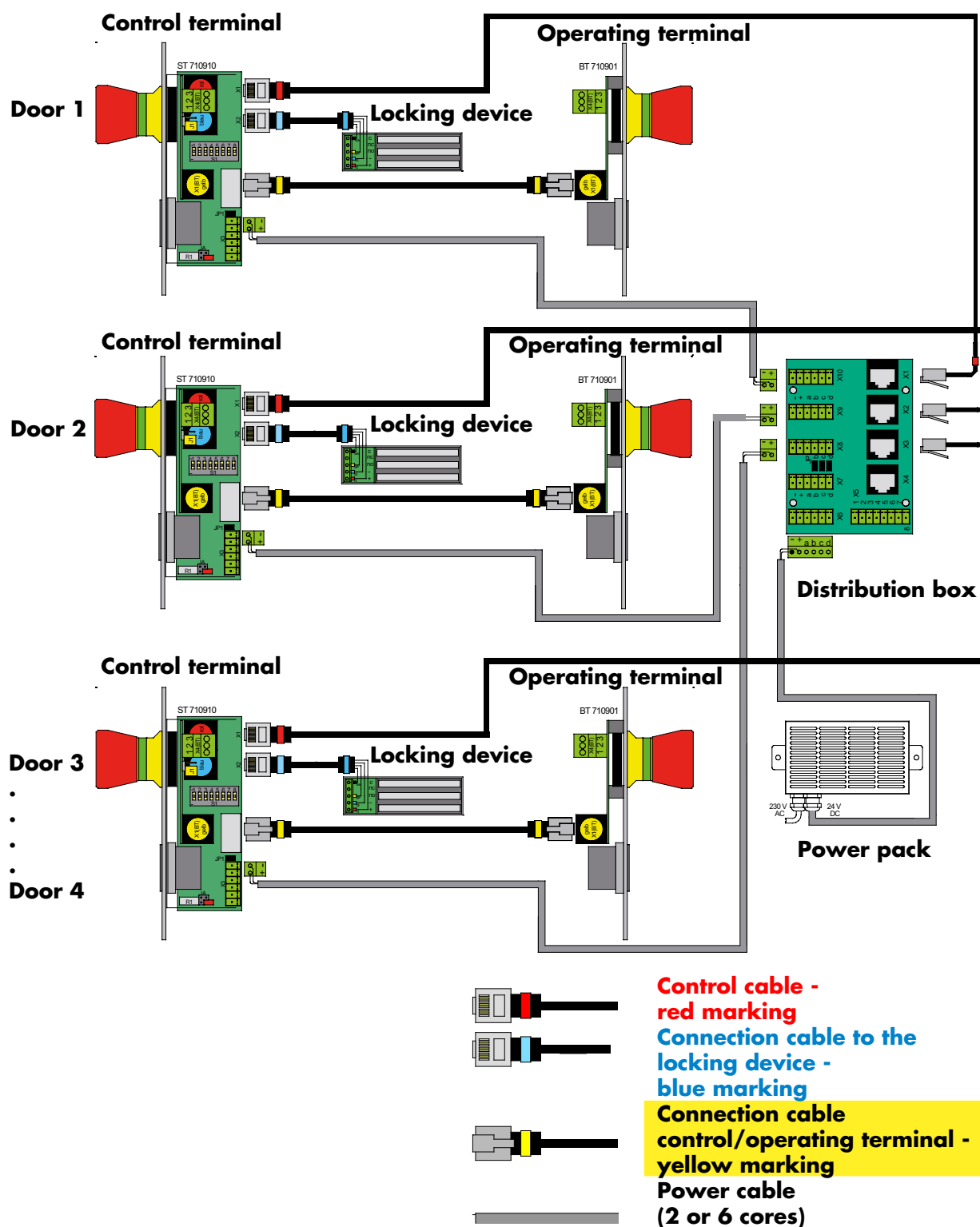


Example Connection Diagram of a Standard System with 8 Doors and 3 Distribution Boxes



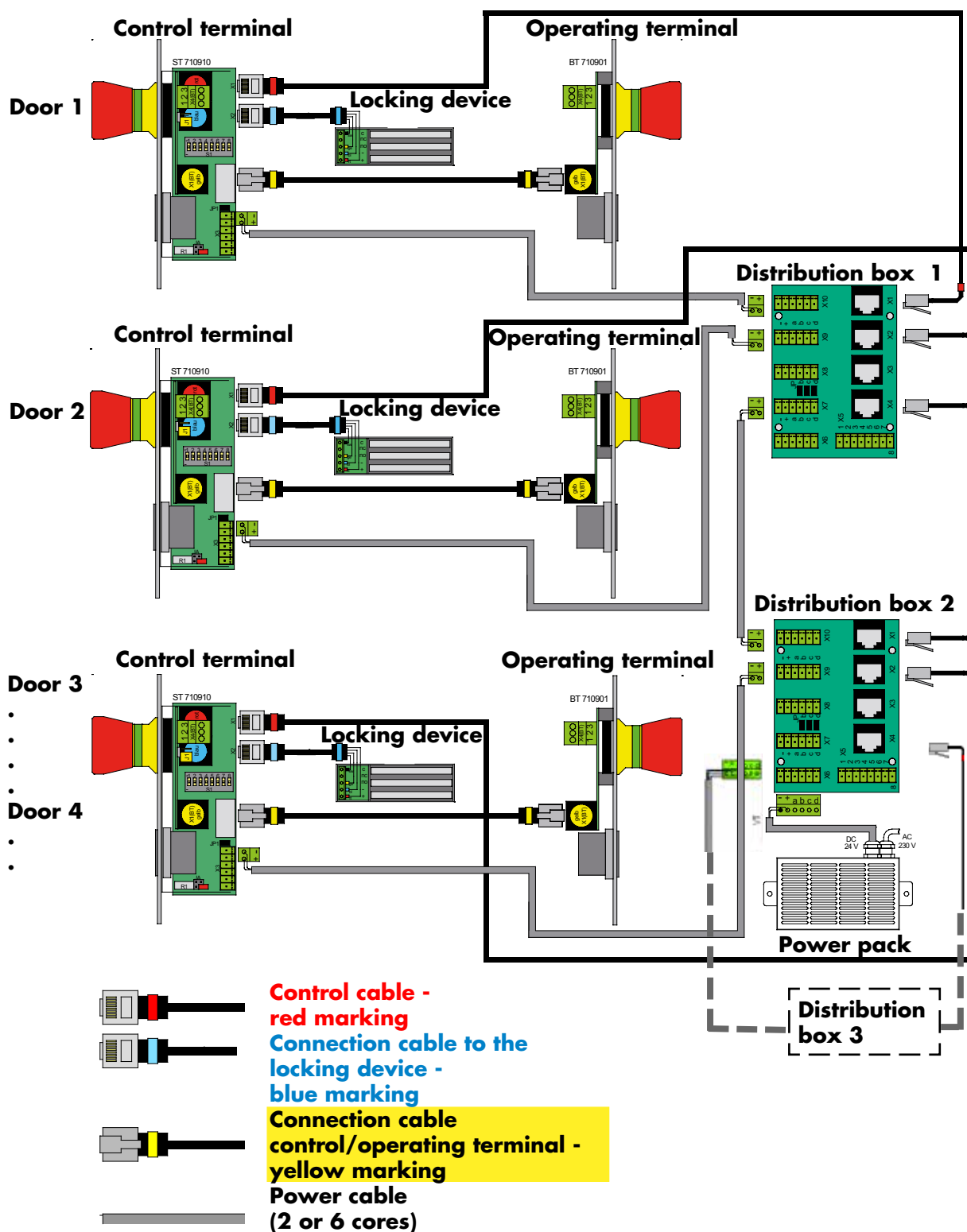
Basis Connection Diagram with 1 Distribution Box

There can be connected to a distribution box a maximum of 4 doors.
The following diagram shows which cable connects which components.



Basis Connection Diagram with Several Distribution Boxes

If there are used two or more distribution boxes, these are also connected with the pluggable cables of the interlock system. The power pack can be connected to any distribution box of the system.

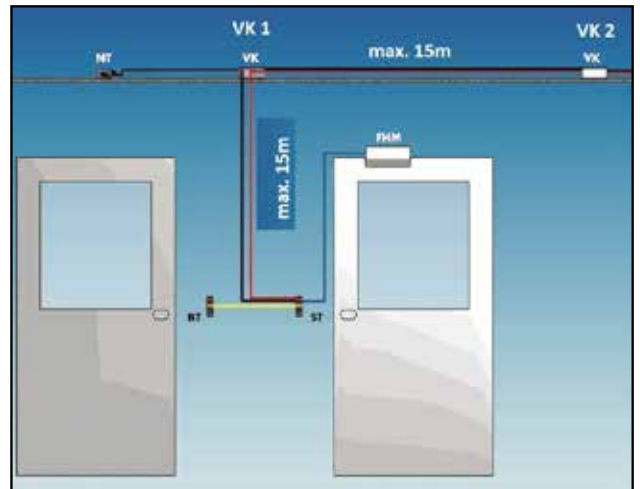


General Mounting Instructions Distribution Box

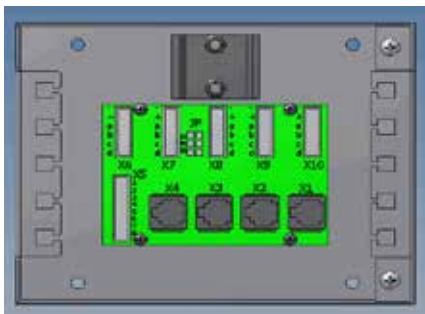
Place of Installation

When choosing the places where to install the distribution boxes you should consider the following:

- Mounting only in dry places (IP rating IP 20)
- Distance to the doors to be connected: the **distance** between distribution box and terminal or the distribution boxes may not exceed **15 m**. The power cables are available with 3, 5, 10 and 15 m, the control cables with 3, 5 and 10 m. If you need a control cable of 15 m, you simply join one of 10 m and one of 5 m with the help of the connector (part no. 710943).



Choosing the Connection Sockets



With a simple standard interlock system the sockets for the cables can be chosen freely (exception: there are special functions to be realised).

Sockets X6, X7, X8, X9, X10: These are intended for plugging in the power cables (to the control terminals as well as from distribution box to distribution box). If the 2 core cable is used for the system, it has to be plugged in at +/- .

Sockets X1, X2, X3, X4: These are for the control cables (red) (to the control terminals as well as from distribution box to distribution box).

Socket X5: This terminal strip is for realising special functions as there are e.g. the discretion circuit (see page Diskr01), the connection of the time control unit (see pages ZM01/02), the connection of measuring and control systems provided by the customer (locking until a certain air pressure or quality of the air has been achieved) etc.

IMPORTANT: With a standard interlock system you are free to choose the plug-in positions as you like. Nevertheless, for clarity and future tracking of the connections you should choose a consistent proceeding (e.g. control cable to terminal of door 1 in X1 and power cable to door 1 in socket X10). In any case you should enter the respective allocation in the plan that sticks in the top cover of the distribution box and also mark the number of the corresponding door or distribution box on the coloured self-adhesive circles on the cables.



General Mounting Instructions Distribution Box - cont

Number of Doors that can be Connected

Basically there can be connected **4 doors to one distribution box** of a simple interlock system.

Condition:

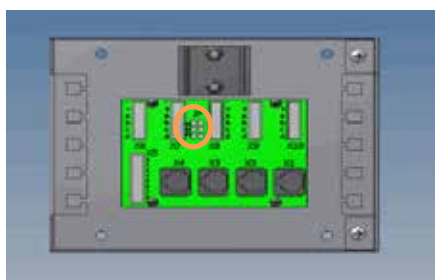
- There are in total only 4 doors.
- The doors can be connected to the distribution box with cables of 15 m maximum.
- There are no special functions required as for example a global emergency-open.

In all other cases the number of doors that can be connected depends on the requirements of the interlock system and the number of used distribution boxes (see also example connection diagram for a standard system with 8 doors and 3 distribution boxes on page B07).

Cable Introduction

After unscrewing the top cover (Attention: one side of the top cover has ears that stick in the casing) the cables to be connected are put on the lateral cable support brackets. To make sure there is no strain on the cables they are fixed with tie wraps to the holes in the cable support brackets. When the connection work is finished the top cover is put back and fixed again. The blocks of cellular material on the cover protect the interior of the distribution box against dust.

Function of the Jumpers in the Distribution Box



In the distribution box VK3 there are three jumpers between the sockets X7 and X8: 11, 12 and 13. These three jumpers bridge the contacts b, c and d between the sockets X6/X7 and X8/X9/X10.

If, for example, the information "door locked" of door 1 and of door 2 the information "release time exceeded" have to be processed, door 1 has to be connected to X6 or X7 and door 2 to X8, X9 or X10. By removing the jumper 12 (contact c) interrupts the circuit and both informations can be processed separately.

With very particular and complex interlock systems it can be necessary to branch off some corresponding leads for the power supply in the power cable to the next distribution box. If this applies to your system, please contact our technical department.

Plug-In Position for Additional Relays

Above the sockets for the cables there is a top hat rail type TS35/7,5 according to EN 60715 in the distribution box. Here can be placed besides the relay for the global emergency-open (see page GNA01) also the relays for other special functions.

General Mounting Instructions Power Pack

Mounting of the Power Pack

IMPORTANT:
The power pack may
only be opened by an
electrician!



When choosing the place for the power pack you should consider the following:

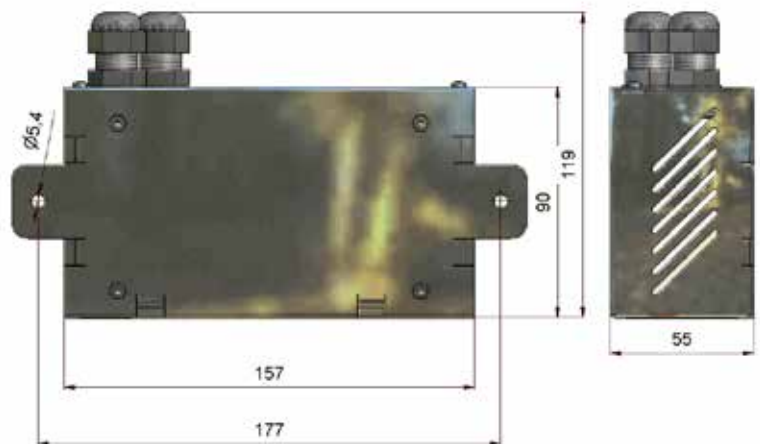
- Mounting only in dry places (IP rating IP 30)
- With operating temperatures (-10 °C to +50 °C are permissible) below 0 °C it has to be made sure the power pack doesn't ice over.
- The lateral ventilation slots have to remain uncovered and the circulation of the air may not be obstructed.
- **The power pack is complete with all plugs and doesn't have to be opened for mounting.**

The length of the connectorised, plug-in cables influences the choosing of the mounting place:

Maximum distance to a 230 VAC socket-outlet: 1.5 m

Maximum distance to a distribution box of the system: 2.0 m

The power pack is fixed with M5 screws at the two lateral ears.



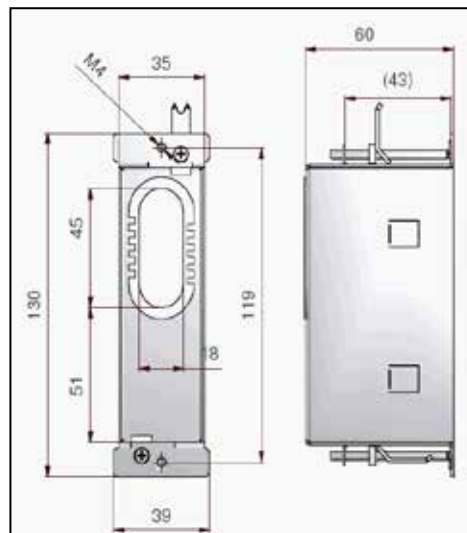
IMPORTANT: If the interlock system comprises several distribution boxes, the connection cable of the power pack with the 6 core plug can be plugged in in any of the distribution boxes (sockets X6 - X10)!

General Mounting Instructions Terminals

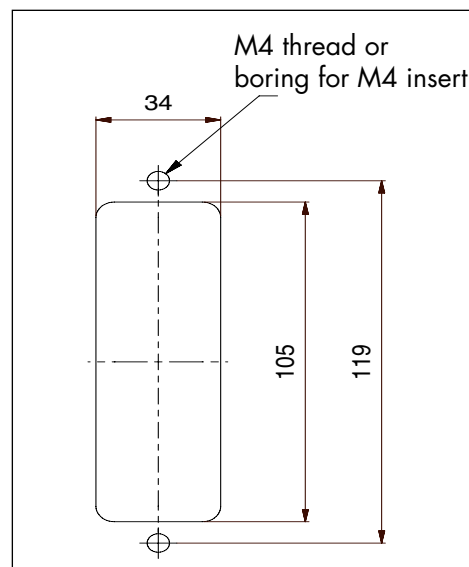
Mounting of the Control/ Operating Terminals, the Time Control Unit

The control or operating terminals are usually **"flush"** mounted directly in the door frames. Especially in clean room areas the front plates should be flush with the frame surface.

The standard flush box (part no. 710829 (see adjoining dimensioned drawing)) is suitable for mounting the control or operating terminal and the time control unit. The emergency exit terminal requires due to its greater height the special flush box with the part no. 710834.

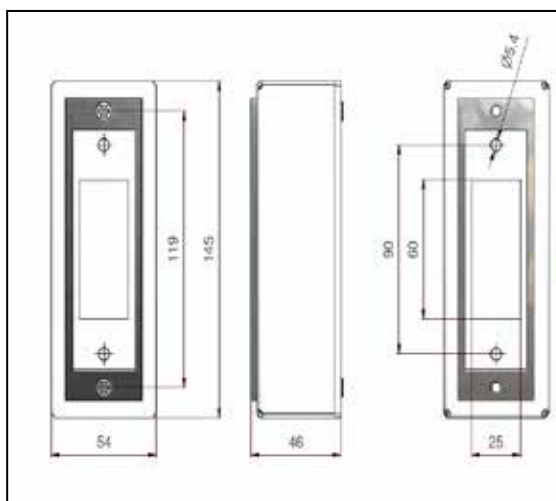


In case the terminal shall be mounted **directly in the frame - without flush box -**, there has to be made an opening according to the adjoining drawing. The front plate of the terminal, however, will then bear on the frame profile, i.e. it protrudes a little.



For those cases where a flush mounting or an installation in the frame is not possible, there are **surface** boxes available. They are powder-coated. They are designed for the cables entering from behind.

The adjoining drawing shows the surface box for the control/operating terminal and the time control unit.

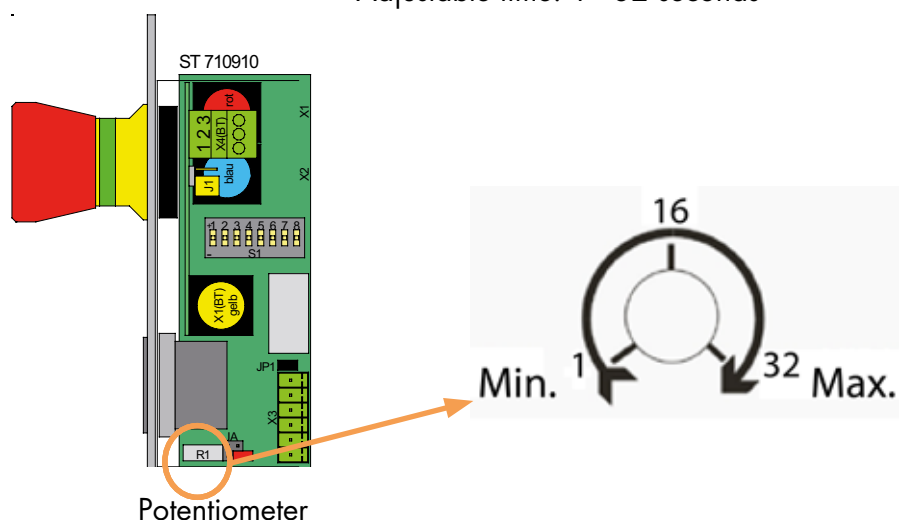


General Instructions Control Terminal

Potentiometer to Adjust the Release Time

After pressing the piezo-type key on the control/operating terminal the door is released during an adjustable time. This time is adjusted with the potentiometer of every control terminal. It determines the span of time after pressing the operating key during which the door can be opened. As soon as this period has passed the door is locked again. It doesn't matter if the door had really been opened. The period of time to be adjusted is influenced among others by the fact the interlock being one for persons or material or whether there should also be linked a surveying function with this span of time (see Positioning of jumper JA on page B017/018 and pages Plus01/02/03).

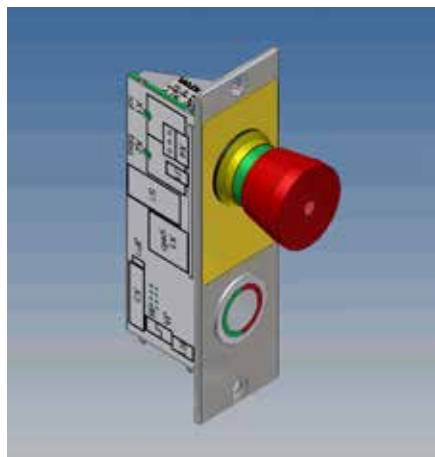
Adjustable time: 1 - 32 seconds



Saving of Adjustment Changes in the Control Terminal

After every modification of adjustments in the control terminal the whole system has to be switched off for a short time and then turned on again. Otherwise the modified settings will not be applied. This applies to the above described changing of the time the door is released as well as to modifications of the door dependencies by the DIP switches.

Illuminated Indication on the Operating Key (Piezo-Type)



General Instructions Control Terminal - cont.

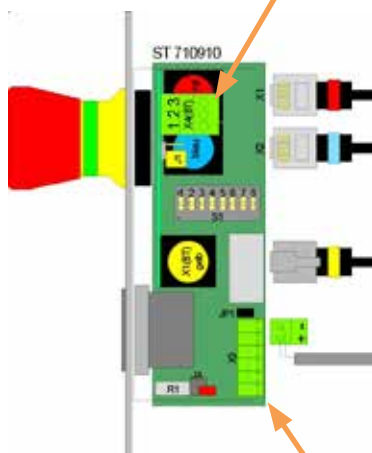
The status of the door (open or locked) is indicated by the illuminated ring around the operating key. The indications have the following meaning:

- **Illuminated ring "green"**: The door is locked properly. It can be unlocked by pressing the piezo-type key and thus be opened.
- **Illuminated ring "red"**: The door is locked properly. At the moment it cannot be opened because it is locked by another open door. The colour of the indication will change to "green" only when the other door will have been closed.
- **No illumination of the ring**: This always happens when there is no feedback from the locking device to the control terminal. *Normal function*: the door is released or open.

Error status:

- the door is open although it is not released
- the emergency shut-off is activated
- the system is out of order
- the feedback contact of the locking device doesn't connect (e.g. the counter plate adheres not completely to the magnet)

Connections to the Control Terminal



Terminal strip X4

There can be connected large surface switches or access controls to this terminal strip (condition: they have a potential-free contact).

Normal function:

X4/1 - X4/2 jumpered (by default)
X4/2 - X4/3 open

Connection of large surface switch (having equal rights as the piezo-type key):

X4/1 - X4/2 jumpered
X4/1 - X4/3 connection of a large surface switch

Connection of access control

Option 1: The access control assumes the function of the piezo-type key
X4/1 - X4/3 connection of the access control

Option 2: The access control releases the piezo-type key which then has to be pressed to unlock the door (under the condition that the ring illumination is green)

X4/1 - X4/2 connection of the access control

IMPORTANT: When an access control is connected, the jumper between X4/1 and X4/2 has to be removed. The cable between terminal and access control may not be longer than 5 meters (see also page B024).

Terminal strip X3

The power cable is connected to the terminal strip X3.

IMPORTANT: The cable with the 2-pin connector has to be plugged in in the positions -/+ . The 6-core cable with 6-pin connector cannot be plugged in in a wrong position.

General Instructions Control Terminal - cont.

Emergency-Open Switch

In case of danger the door can be unlocked by pushing the illuminated emergency-open switch even though being locked. After having been pressed the button remains locked in the pushed position.

To reset the interlock control system, the emergency-open switch has to be unlocked by turning it. After a short delay the interlock control system will be working again.

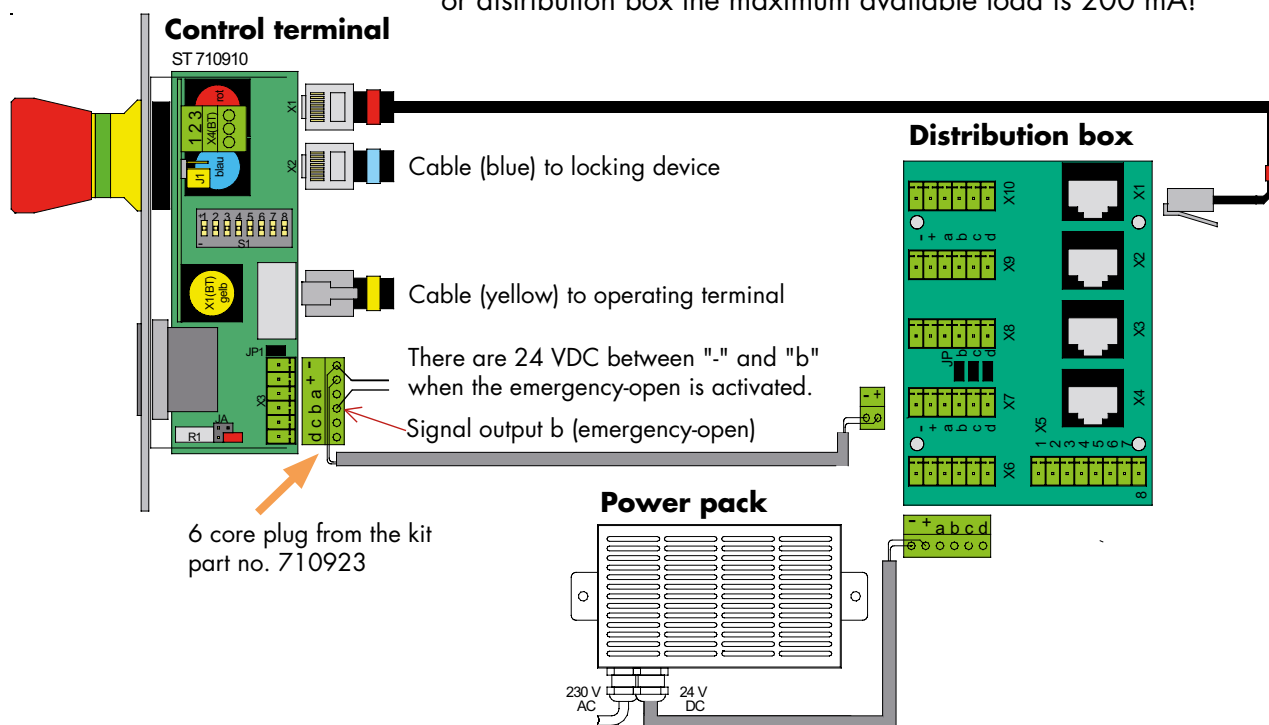
Normally the emergency-open switch unlocks only the respective door (local emergency-open). But it is also possible to install emergency-open switches that, when being pressed, unlock all doors of the interlock system (global emergency-open). Please see also information on page GNA01.

Relaying the emergency-open switch having been pressed with local emergency-open or per door with global emergency-open

If pressing the emergency-open switch on a door with potential (24 VDC) should be passed on, this is realised according to the following circuit diagram. Here the information is tapped directly in the control terminal. For this purpose you also need one 6 core plug connector (from the kit part no. 710923). The 2 core plug is disconnected from the power cable and the files are then connected to the 6 core plug (+ and -).

It is also possible to tap the information in the distribution box. In this case there can only be connected two doors to the distribution box and a 6 core power cable is required. On request we will gladly send you the wiring diagram.

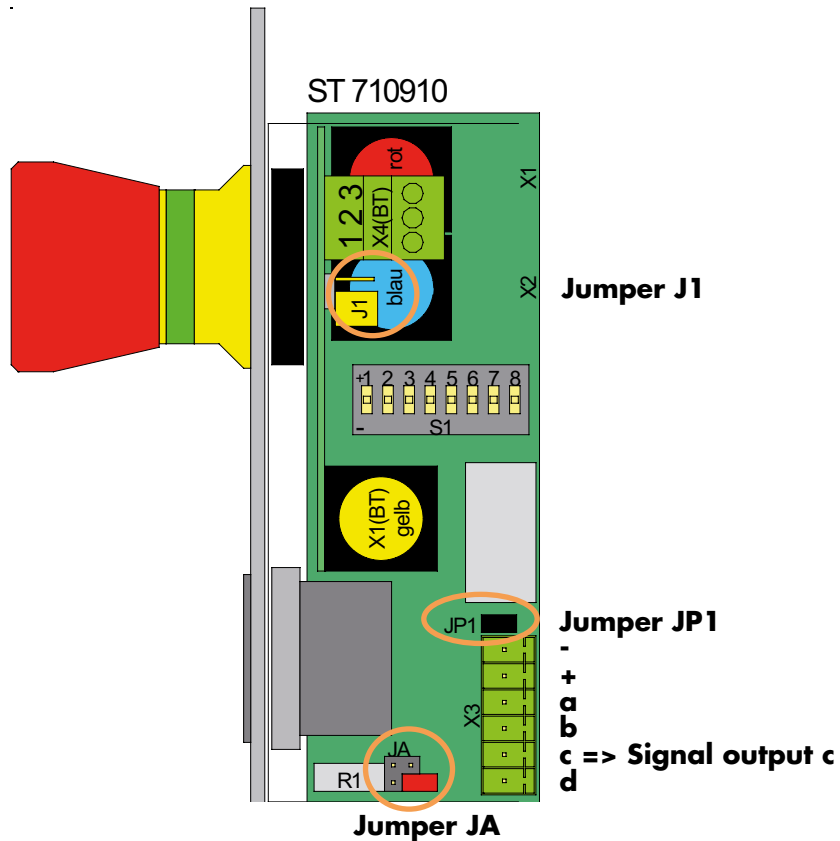
IMPORTANT: On the signal outputs a, b, c and d of the control terminal or distribution box the maximum available load is 200 mA!



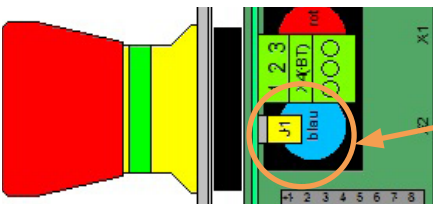
General Instructions Control Terminal - Basic Version: Positioning of the Jumpers

Jumper of the Control Terminal "Basic"

Please use a precision
mechanic flat nose plier to
remove or reposition the
jumpers.



Functions of the Jumpers



Jumper J1

By default the Jumper J1 is plugged on 1 pin and also has to remain in this position.

EXCEPTION: The jumper has to be plugged on both pins when the control terminal is used as a **stand-alone terminal**, i.e. there is connected no operating terminal.

Jumper JP1

By default the jumper JP1 is always plugged in and has to remain there.

EXCEPTION: In the interlock control system there is realised a global emergency-open (when pressing the emergency-open switch on one door all doors of the interlock system will be released). In this case in all control terminals of the system the jumper JP1 has to be removed (see also function global emergency-open on page GNA01). For this function the 6 core power cable is required.

Jumper JA

The jumper JA allows to adjust certain functions for the signal output "c" (see next page). The default position of jumper JA is shown in the above picture.

IMPORTANT: If you use the signal output c, you always have to employ the 6 core power cable.

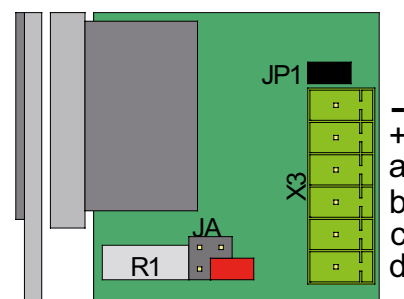
The signal output c is
scanned **in the
distribution box** on the
terminals "+" and "c".

General Instructions Control Terminal - Basic Version: Positioning of the Jumpers - cont.

Jumper JA - Possible Positions and Functions Feasible with them

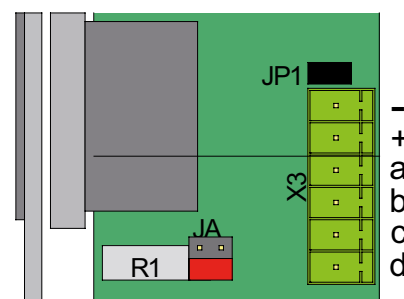
Position 1

Signal: door open
(active: 24 V applied)
The door is not locked by the locking device, i.e. the feedback contact is open.



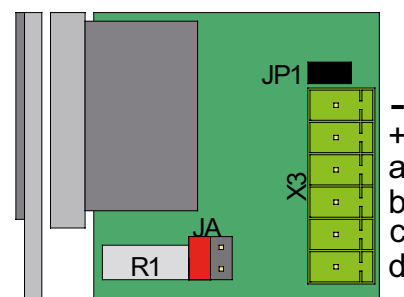
Position 2

Signal: time exceeded during which the door can be opened
(active: 24 V applied)
This signal is used e.g. to control the maximum time span during which the door can be opened, e.g. with a particular air quality).



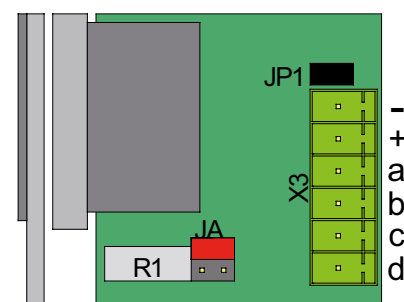
Position 3

Signal: door locked
(active: 24 V applied)
A door of the interlock system is open which is depending on this door.



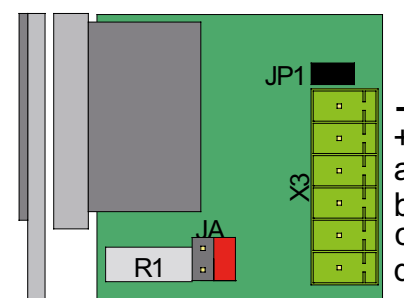
Position 4

Signal: door locked and open
(active: 24 V applied)
Due to the adjusted dependencies the door would have to be locked but nevertheless is open, i.e. there is no feedback of the locking device. This can happen e.g. with a defective locking device.



Position 5

Signal: door released
(active: 24 V falling off)
This door is released and the time during which the door can be opened has not yet run out.



General Instructions Operating Terminal

Connection Operating Terminal

The operating terminal is connected with the yellow pluggable flat cable to the control terminal. The operating terminal requires no adjustments.

Without any difficulty there can be combined a control terminal with/without emergency-open switch with an operating terminal without/with emergency-open switch.

If there is no operating terminal connected (***stand-alone installation of the control terminal***), only the position of the jumper J1 is changed in the control terminal (see page B017).

Technical Data of the Components**Control Terminal**

Supply voltage	24 VDC +/-15 %
Power consumption <u>with</u> e.-open <u>without</u> emergency-open	max. 50 mA max. 40 mA
IP rating	IP 20 (operating key IP 65)
Switching capacity per output	250 mA, make contact (NO)
Operating key	piezo-type key with red/green illuminated ring
Emergency-open switch	push-to-lock mushroom-type palm-button, illuminated
Emergency-open contact set	1 make contact (NO): 500 mA
Operating temperature	-10 °C to +40 °C

Operating Terminal

Supply voltage	24 VDC +/-15 %
Power consumption <u>with</u> e.-open <u>without</u> emergency-open	max. 30 mA max. 15 mA
IP rating	IP 20 (operating key IP 65)
Operating key	piezo-type key with red/green illuminated ring
Emergency-open switch	push-to-lock mushroom-type palm-button, illuminated
Emergency-open contact set	1 make contact (NO): 500 mA
Operating temperature	-10 °C to +40 °C

Emergency Exit Terminal

Supply voltage	24 VDC +/-15 %
Power consumption	max. 80 mA
IP rating	IP 20
Emergency-open switch	push-to-lock mushroom-type palm-button, illuminated
Emergency-open contact set	2 break contacts (NC): 2.8 A
Input hazard alert system	break contact
Output signaller (e.g. horn)	24 VDC, max. 1.4 A
Operating temperature	-10 °C to +40 °C

Distribution Box

IP rating	IP 20
Strain relief for the cables	fixing with tie wraps
Top hat rail	type TS35/7.5 according to EN 60715

Technical Data of the Components - cont.

Time Control Unit

Supply voltage	24 VDC +/-15 %
Power consumption time control unit	max. 20 mA
Power consumption additional display - extension circuit module	max. 2 mA
Power consumption time control unit - additional display	max. 10 mA
IP rating	IP 20
Operating temperature	-10 °C to +40 °C
Periods	16 different periods adjustable 0, 15, 20, 25, 30, 35, 40, 50, 60, 120, 180, 240, 300, 420, 540, 660 seconds) max. period 2.75 hours
Number of doors to be controlled	6 cleanroom and max. 6 "blackroom" doors

Power Packs

Voltage	100 - 240 VAC / 46 - 63 Hz
Power consumption max.	0.9 A (version 2.7 A) 1 A (version 5 A)
Output voltage	24 VDC (+/-10 %)
Output current	2.7 A (65 W) respectively 5 A (120 W)
IP rating	IP 30 (only for dry surroundings)
Operating temperature	-10 °C to +50 °C



EU Declaration of Conformity

This Declaration of Conformity is only valid as complete appendix, including power packs (part nos. 710762, 710763, 710780, 710718, 710782, 710783)

Manufacturer

DICTATOR Technik GmbH
Gutenbergstraße 9
86356 Neusäß, GERMANY

Product Description

Control and operating terminals

710759 Control terminal ST1
710761 Control terminal ST3
710764 Control terminal ST 1 ZK
710767 Control terminal ST 1 oN
710768 Control terminal ST 1 SA
710775 Control terminal ST 1 SA oN
710800 (I) Control terminal ST P
710801 (I) Operating terminal BT P
710802 (I) Control terminal SToN P
710803 (I) Control terminal BToN P
710825 Control terminal ST U
710826 Operating terminal BT U
710827 Control terminal SToN U
710900 (I) Control terminal ST3 Plus
710901 (I) Operating terminal BT3
710902 (I) Control terminal ST3oN Plus
710903 (I) Operating terminal BT3oN
710904 Operating terminal BTZ for central controller
710905 Operating terminal BTZoN for central controller
710910 (I)) Control terminal ST3 Basic
710912 (I)) Control terminal ST3oN Basic
710833 Emergency-open terminal FT P
710860 Emergency-open terminal FT3

710980 Control terminal ST3 T RFID
710981 Operating terminal BT3 T RFID
710982 Control terminal ST3 ToN RFID
710983 Operating terminal BT3 ToN RFID
710984 Operating terminal BTZ T RFID
710985 Operating terminal BTZ ToN RFID
710986 Control terminal ST3 T Plus RFID
710987 Control terminal ST3 ToN Plus RFID

Distribution boxes, central controllers, accessories

710807 Distribution box VK1
710821 Distribution box VK2
710922 Distribution box VK3
710920 Central controller RJ
710924 Central controller SK
710769 Time control unit ZS
710805 (I) Time control unit ZS
710806 (I) Secondary display ZA
710808 Extension module ZE

DICTATOR

The provider herewith declares that the mentioned components of the interlock control system comply with the listed EU directives and the relevant Community harmonization legislation – including their changes valid at the date of this declaration.

A) EU directives

- 2014/35/EU low voltage directive
- 2014/30/EU EMC directive
- 2011/65/EU RoHS directive

B) The following harmonized European standards have been applied:

- **EN 60950-1:2006+A11+A1+A12:** : Information technology equipment - Safety - part 1: General requirements
- **DIN EN 61000-6-2:2006-03:** Electromagnetic compatibility (EMC) - part 6-2: Generic standards – Immunity to interference for industrial sectors (IEC 61000-6-2:2005)
- **DIN EN 61000-6-4:2011-09:** Electromagnetic compatibility (EMC) - part 6-4: Generic standards – Transient emissions for industrial sectors (IEC 61000-6-4:2006 + A1:2010)

C) The following other standards and directives have been applied:

- **VDE 0701:** Maintenance, changing and testing of electrical devices

Addendum to the EMC directive 2014/30/EU:

When there are effects of bursts, for improving the HF shielding we recommend to use a mains filter (type: Schaffner FN 2070 6 06 or similar) in the mains cable of the power pack or to earth the casing of the power pack also externally.

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Neusäß, 9 May 2016



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Troubleshooting



Before opening covers or disassembling components of the interlock control system these have to be separated from the power line, i.e. the power packs have to be isolated electrically!

The power supply has also to be interrupted before all adjusting and connection works on components of the system, i.e. the power pack(s) have to be isolated electrically.

Ring on the terminals is not illuminated.

IMPORTANT: This is not always a fault. Normally the ring is not illuminated whenever there is no feedback from the locking device to the control terminal, i.e. the door is released or open.

But if this state does not apply, this may indicate an error.

Error status:

- The door is open although it is not released.
- The emergency-open is pressed.
- The system is out of order.
- The feedback contact of the locking device does not switch (e.g. the counter plate rests not completely on the magnet).

The operating terminal is connected but doesn't work.

The operating terminal has been connected with the yellow flat cable to the control terminal, but when pressing the piezo-type key or the emergency-open switch nothing at all happens: Check the position of jumper J1 on the corresponding control terminal. The jumper has to be placed on **one** pin only, not on both (see page B016).

A door is equipped with a control terminal only (no operating terminal), but it doesn't work.

If a control terminal is used as stand-alone terminal, i.e. there is no operating terminal on the other side of the door, the jumper J1 of the control terminal has to be placed on **both** pins (see page B016).

Piezo-type key is illuminated but without function.

If the piezo-type key is illuminated but pressing doesn't release the door: Check the terminal strip X4 of the control terminal. In this terminal strip there has to be placed a jumper between X4/1 and X4/2.

There is no power supply at a terminal.

No 24 VDC power supply: If there is used a 2 core power cable, please check whether it has been plugged in in the sockets +/- in the control terminal as well as the distribution box!

The indication of the terminal shows red but should be green according to the adjusted dependencies.

- Check the connections in the control terminal (Do the colours of the connection cables coincide with those of the sockets?).
- To detect a possibly defect control terminal put all DIP switches to "0" and return them one by one to their correct position. When connecting the defect terminal the failure will happen again. This terminal has to be replaced.

Troubleshooting - continuation

The door unlocks on its own - without the piezo-type key having been pressed.

- Check whether surges can cause parasitic coupling on the power pack or by induction directly on the connection cables to the terminals. If necessary, install a mains filter (type: Schaffner FN 2070-6-06 or similar) in the mains cable of the power pack or in addition externally earth the casing of the power pack. Or equip cables which are exposed to particularly strong induction voltage with a clamp-on ferrite.

The locking devices don't work properly.

- Check whether the locking devices are suitable for 24 VDC or whether the jumper of the bar magnets has been placed on 24 VDC.
- Check whether the counter plate of the bar magnets lies completely and even on the bar magnet - without any mechanical tensions (check possibly with a separate counter plate). If necessary, correct the mounting of the bar magnet and the counter plate.
- Check with electric strikes whether the door latch functions properly (with too tight seals it may happen that the latch cannot engage correctly).
- Check the feedback contact (there has always to be connected the make contact NO). With bar magnets with Hall sensor the feedback contact can be checked only under tension. Electric strikes should be switched mechanically and also be checked with a measuring instrument. The functioning of a separate magnetic contact should be controlled with a permanent magnet.

The interlock control system doesn't work at all or not reliably.

- Check the power pack: Fuse okay, is the output power supply sufficient for the connected devices?
ATTENTION: Before any works, always isolate the devices electrically!!!
- Are the jumpers in the control terminals and the distribution boxes placed correctly?
- Check the secure and firm connection of the cables to the locking devices.
- Measure if there apply 24 VDC (power pack, terminals, locking devices).

When closing the door at the end of the release time, the locking device is locked shortly and then immediately released again.

Check whether in the terminal strip X4 of one of the terminals (control/operating terminal) of this door an access control or a large surface switch is connected. In this case the connection cable provided on site may not be longer than 5 meters.

In case it is longer than 5 meters, the leads connected in terminals 1 and 3 (terminal strip X4) have to be guided apart from each other or a relay has to be interconnected (at a maximum distance of 5 meters cable length to the terminal strip X4).