

## Interlock control system

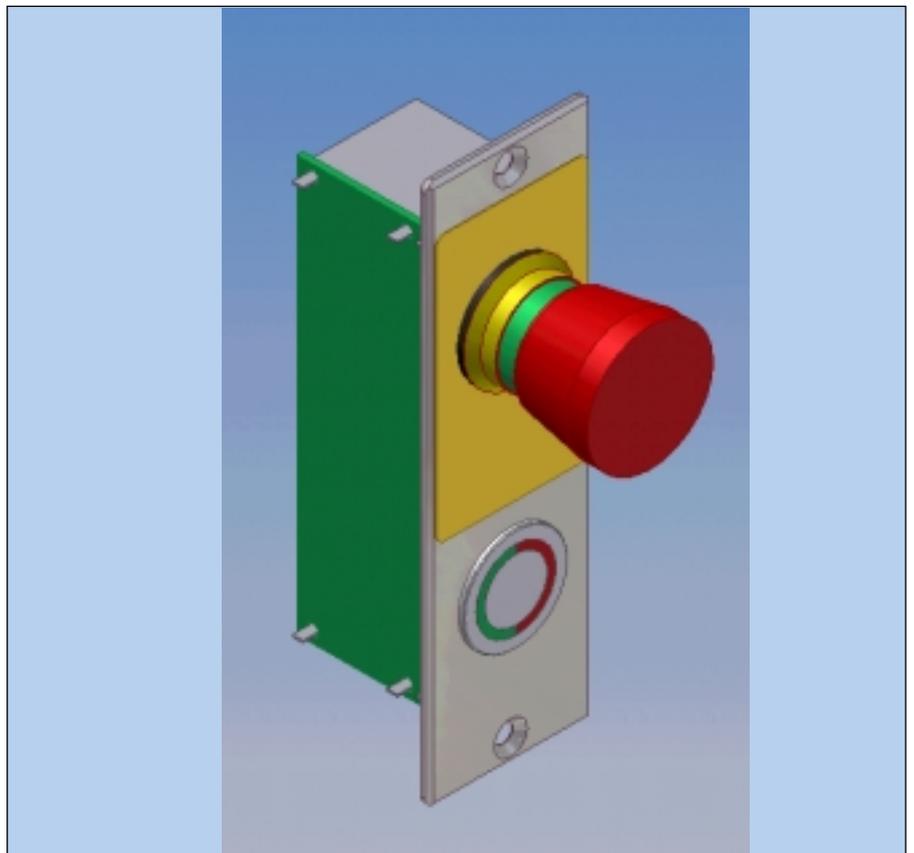
e.g. for clean rooms or laboratories

Quite often one of the requirements of clean-room technology or laboratories is, that certain doors may only be opened if others are closed. The DICTATOR interlock control system is **the ideal solution to link units of up to 10 doors**.

The dependencies between different doors are programmed directly in the respective control modules on each door using a **very easy adjustable matrix control system**. This is done with DIP-switches representing the different doors. The dependences / links between the doors can **also be changed on site at a later stage**, not requiring any special programming know-how.

The interlock control terminal is provided with a **potentialfree make-break contact**. This permits e.g. to pass on the information on each door to a central control system.

The DICTATOR interlock control system is a **modular system** and therefore extremely **flexible** and easy to adapt to different sizes of door units and requirements.



### Components

Interlock control terminal with push button, illuminated ring green/red and Emergency-Open switch (incl. timer, DIP-switches, control board, potentialfree contact)

Operating terminals (for the opposite side of the door, supplementing the control terminal) either only with push button or push button and Emergency-Open switch

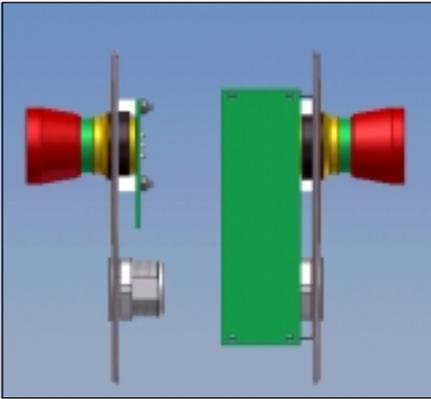
Locking units:

- TVR1 door lock or

- Bar magnets (with feed-back contact)

230VAC/24VDC power pack, stabilized, 2,7 A or 5 A





## Interlock control system - System, components

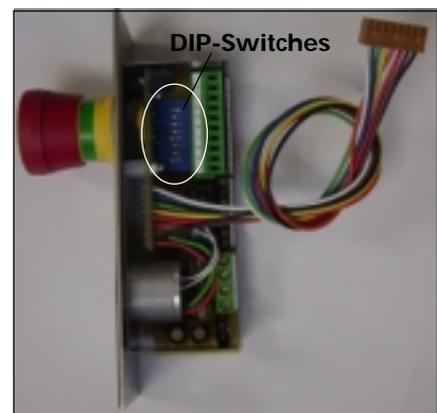
The interlock control system is designed for a **maximum of 10 doors**. A very simple to adjust matrix control permits to determine the link between the different doors on site. And also to change the links and dependencies later on.

If the interlock unit consists of less than 10 doors, the remaining DIP-switches are just not used. These units can however be enlarged later on to the maximum of 10 doors without having to change the interlock control terminals on the existing doors.

## Functioning

The interlock control system permits to link up to 10 doors. The dependencies between the different doors of the unit are set with 10 DIP-switches per door. For details of the adjustment please see page 08.012.02. There you will find also a matrix, where you can enter the links of your unit.

A potentiometer permits to adjust for each door for how long (0 - 45 sec) it remains unlocked after the push button has been pressed. When this time has elapsed the door will be locked again and cannot be opened unless the push button is pressed again. The period of time to adjust depends amongst others e.g. on the use of the door: interlock systems for materials or persons



## Components

The main characteristics of Dictator interlock control system is its lack of a central complex control system. It splits up the functions to small control modules on each door. This reduces considerably the wiring of the whole installation.

### Interlock control terminals with Emergency-Open switch and push button

For each door one interlock control terminal is required. This terminal consists of the Emergency-Open switch, a push button and the control circuit board. The DIP-switches are located on this board. Furthermore there are the potentiometer to determine the duration of unlocking (0 - 45 sec.) and the potentialfree make/break contact.

The control circuit board is fixed as a kind of back pack to the front plate of the control terminal. Normally the door frame profiles offer enough space to permit a flush installation of the interlock control terminal.

### Operating terminals

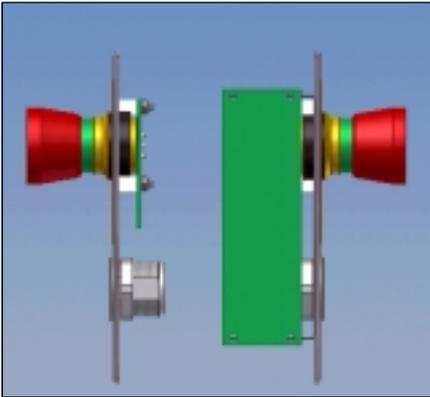
Normally an additional "normal" operating terminal is required for the opposite side of the door. This consists either just of the push button or the push button and the Emergency-Open switch.

### Central power pack

The 24VDC-power supply of the terminals and the locking units is assured by a central power pack. They are available either with 2,7 A or 5 A, depending on the components used in the interlock unit and their power consumption.

### Locking unit

The doors of the interlock unit can be locked with the Dictator TVR1 door lock or bar magnets. The TVR1 door lock is recommended due to its very low power consumption and its very high locking force.



### Interlock control system - Terminals

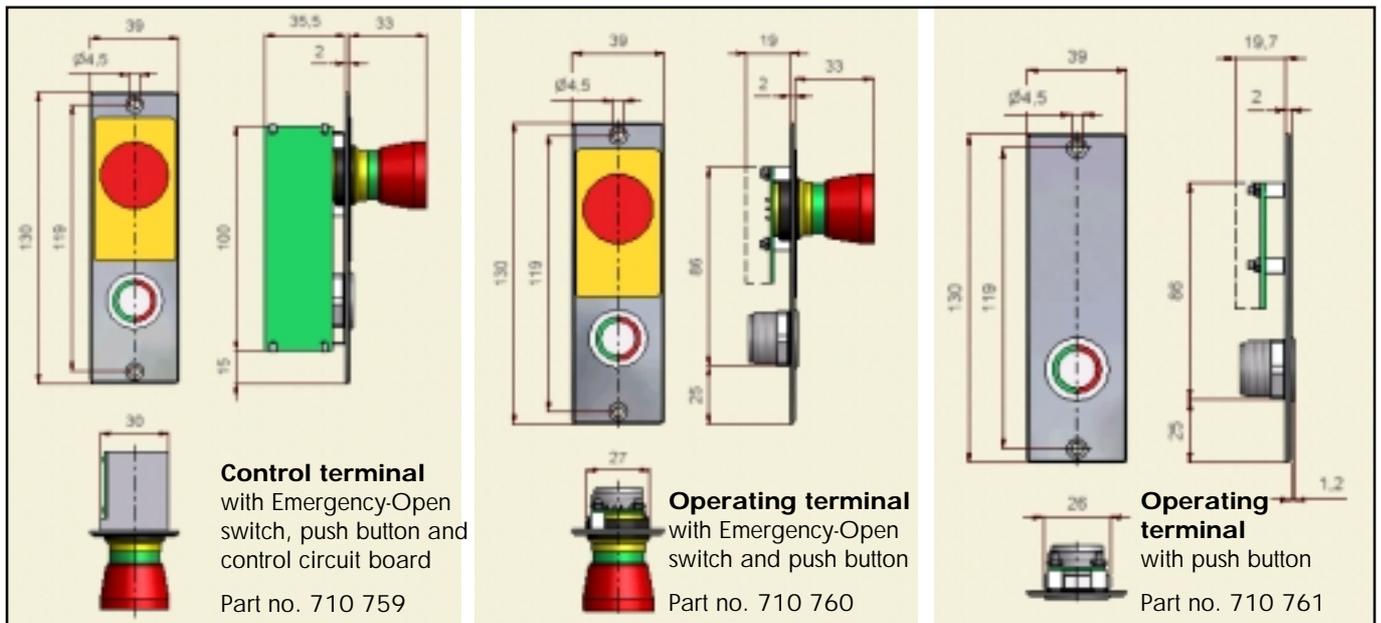
Apart from the locking unit the terminals are the main component of the DICTATOR interlock control system. Normally there are two terminals required on each door. The **interlock control terminal** with the circuit board is installed **on one side of the door**. **On the opposite side** there is required just an **operating terminal**, either just with push button or with an additional **Emergency-Open switch**.

The DICTATOR meet the requirements for clean-room equipment. For push button a special piezo-type push button is used, that reacts already on very little pressure. The push button is surrounded by an illuminated ring, one half red, the other half green. Both front plate and push button are made of stainless steel.

### Technical data

Power consumption terminal	24 VDC, 60 mA
Protection	IP 20 (push button IP 65)
Capacity of the potentialfree contact	Make/break, max. 1,2 A at 42 VAC/DC
Push-button	Piezo type
Emergency-Open switch	Push-to-lock switch

### Dimensions



### Indication of the status of the door

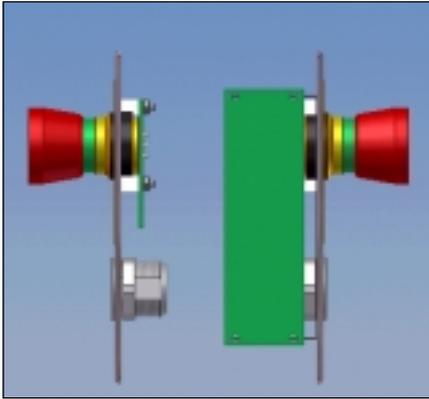
The **indication of the door status** (unlocked or locked) is realized with an illuminated ring around the push button.

- Normal status, door can be opened by pressing the push button: "green" illumination
- If the push button of one door is pressed and this door is opened within the adjusted time, the doors that according to the adjustment may not be opened while this one is open, are locked. The illumination of the ring of these doors will change to "red". This permits to see immediately that these doors cannot be opened at the moment. The push buttons remain inactive during this time.
- After the door has been closed again, the locked doors are unlocked again. The illumination around the push button switches back to "green".

### Emergency-Open switch

Two of the three available terminals are equipped with an **Emergency-Open switch**. It permits to unlock the door in case of danger, even if they are locked. It is possible to adjust whether the Emergency-Open switch just unlocks the door where it is installed or all doors of the interlock unit.

Upon unlocking the Emergency-Open switch again, the interlock control system will effect an automatic RESET and is ready to work again after a short lapse of time.



### Interlock control system - Installation

The compact design of the interlock control terminal reduces the installation work considerably. There are just the terminals and the locking unit to install at each door. No additional push buttons and thus no additional cuts in the door frames are required. Reducing the number of components later on will also facilitate the cleaning of the area.

### Installation / Electrical connection

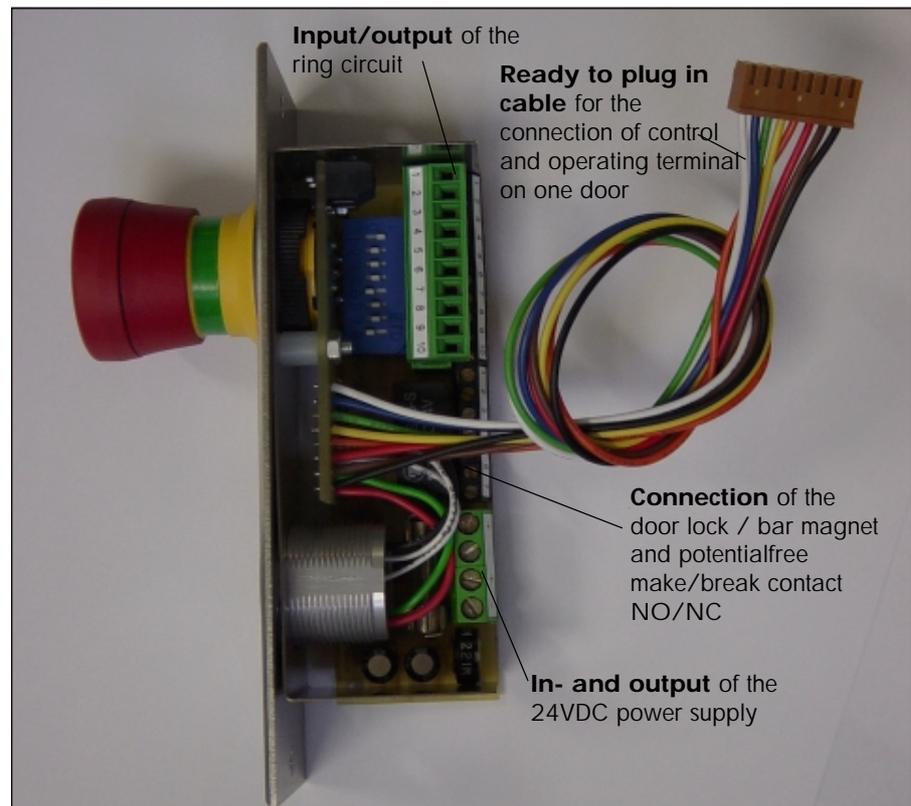
The terminals are built into the door frames. Normally the hollow space of the profiles used provides enough space for the interlock control terminals with their circuit board.

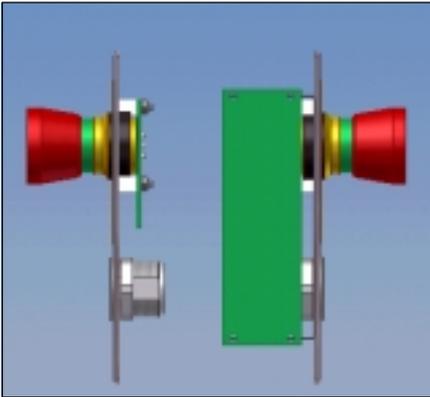
All **control terminals** are connected via a **ring circuit**, which minimizes installation work. The number of leads depends on the number of doors in the interlock unit. For each door one lead is required. In case of 10 doors this would mean 10 leads with a section of 0,5 mm<sup>2</sup>. An additional two-lead cable (2 x 1,5mm<sup>2</sup>) is required for the power supply of the terminals and the locking unit.

**Control and operating terminal of one door** are connected with a ready-to-plug-in cable. No additional connection work is required.

The **door lock** or the bar magnet are connected to the terminal with a 4 x 0,5mm<sup>2</sup> cable (24 VDC-supply and feed-back contact).

In the control terminal there is provided also a **potentialfree make/break contact** in order to pass on the information on the status of the door (unlocked, locked) e.g. to a central control system. The data of this contact can be found on the preceding page (see Technical data).





## Interlock control system - Order information

Depending on the functions required, the space and the size of the interlock unit, the system can be made up by different components.

### Selection of the components

**Basic component** of the interlock control system is the **interlock control terminal**. There is one required for each door of the interlock unit.

On the other side of the door a simple **operating terminal** is installed, either one with push button and Emergency-Open switch or just with a push button.

In order to **lock** the doors DICTATOR proposes the **TVR1 door lock** (see page 08.013.00). Its great advantage is the low power consumption and a very reliable locking. The alternative are **bar magnets** (starting on page 08.015.00 of this chapter). They must be equipped with a feed-back contact. However no approval is required for the interlock application, as the interlock control system is not interfering with emergency exits. The bar magnets are recommended mainly for installations on already existing doors. However their power consumption is quite superior to that of the TVR1 door lock. The bar magnets listed below are just a recommendation.

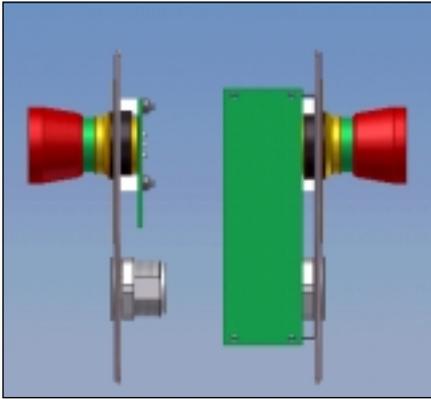
The **24VDC power supply** is assured by a separate **power pack**. Depending on the type of locking unit and the number of doors in the interlock unit either the 2,7 A or 5A power pack is required (see page 08.033.00).

### Order information terminals

Control terminal with Emergency-Open switch and push button	Part no. 710 759
Operating terminal with Emergency-Open switch and push button	Part no. 710 760
Operating terminal with push button	Part no. 710 761

### Order information Required accessories (either TVR1 door lock or bar magnets)

TVR1 door lock, for left handed doors	Part no. 710 750
TVR1 door lock, for right handed doors	Part no. 710 751
FH 300K bar magnet, surface type	Part no. 040 671SET
FH 300UK bar magnet, flush mounting	Part no. 040 281SET
FH 300U35K bar magnet, flush mounting	Part no. 040 284SET
FH 550K bar magnet, surface type	Part no. 040 285SET
FH 550UK bar magnet, flush mounting	Part no. 040 679SET
FH 750IK bar magnet, surface type	Part no. 040 680SET
FH 750IK-F bar magnet, surface type	Part no. 040 681SET
24VDC 2,7 A power pack	Part no. 710 762
24VDC 5A power pack	Part no. 710 763



## Interlock control system

The following matrix helps you to determine without any problem the position of the DIP-switches in the control terminal on each door. Just mark for each door, which other door may be open at the same time and which one must stay locked.

There are 3 positions for the DIP-switches:

Position +: determines the door for which the dependencies are decided (base door)

Position -: this door is locked as long as the "base door" is open.

Position 0: this door can be opened even though the "base door" is open as well.

## Matrix for the dependencies between doors

Door number Base door number	Admissible state of the other doors of the interlock system in dependency of the opened "base door"									
	1	2	3	4	5	6	7	8	9	10
1	■									
2		■								
3			■							
4				■						
5					■					
6						■				
7							■			
8								■		
9									■	
10										■

### Example: Interlock system with 6 doors

Door 1: when door 1 is open, only doors 3 and 4 may be opened as well. Doors 2, 5 and 6 must stay locked.

Door 2: when door 2 is open, only doors 5 and 6 may be opened as well. Doors 1, 3 and 4 must stay locked.

Door number Base door number	Admissible state of the other doors of the interlock system in dependency of the opened "base door"									
	1	2	3	4	5	6	7	8	9	10
1	+	-	0	0	-	-	0	0	0	0
2	-	+	-	-	0	0	0	0	0	0