

Interlock Control System

For the Access Control to e.g. Clean Rooms or Laboratories

In clean rooms, laboratories, hospitals etc. doors may often be opened only when others are closed. The DICTATOR interlock control system facilitates an easy configuration of these **relations**, without a complex PLC control system. The relations are "programmed" directly by DIP switches. Trained persons not requiring any special programming know-how **can modify** them **on site** at any time.

For an easy mounting the components of the newest generation are connected as telephones or networks by cables with **RJ45 connectors** (exception: ex-proof version). The power pack for the 24 VDC supply is provided with a safety plug.

The interlock doors can be unlocked either by pushing the corresponding key on the terminals or free of contact by a transponder, the transponder system having an integrated **access control**.

There is one **exception** from the plug-in version (here the complete electrical wiring has to be effected by the customer):
 - the SP interlock control system for flush fitted switch boxes or pattresses.



System Versions

Peripheral system <i>beginning on page 08.011.00</i>	Extremely flexible, modular structure, can be extended at any time, complex special functions possible, also for installations with doors far apart.
Central system RJ <i>08.019.00 et sqq.</i>	For small systems with max. 5 doors (optionally 8 doors). Max. cable length 15 m. Depth of terminals only about 27 mm.
Ex-proof version	On demand
Switch box version SP <i>beginning on page 08.027.00</i>	The components of the terminals are mounted in an off-the-shelf switch system. Used with central controller SK, electric connection to be provided by the customer.



DICTATOR Interlock Control System - General Information

In the DICTATOR interlock control systems all doors of the interlock system are generally locked and are released only temporarily when the operating key of the terminal is pressed. This offers the highest possible safety within the interlock system.

Every door is controlled by a separate control board. With the peripheral system these are integrated in the control terminal of the respective door, with the central controllers RJ and SK the control boards of all doors forming part of the system are united in a central controller.

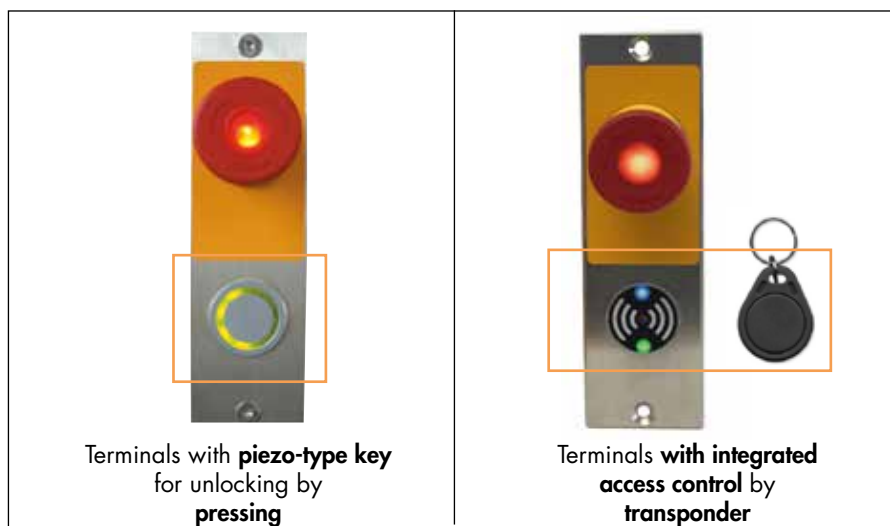
Unlocking the Doors - Options

The peripheral DICTATOR interlock control system as well as the one with a central controller RJ offer **two basic options to unlock** the doors:

- Terminals with key

Here is used the **piezo-type key** with illuminated ring described in the following. Information about the keys for the SP switch box system can be found on the page 08.030.00.)

- RFID terminals without key operated by transponders (integrated access control)



Terminals with **piezo-type key** for unlocking by **pressing**

Terminals with **integrated access control** by **transponder**

An additional possibility to unlock the door is to connect an external switch, e.g. a large surface switch.

Piezo-type key



The piezo-type key is ideally suited for its use in clean rooms. It features no mechanical moving parts where dirt could settle and it is not subject to mechanical wear. It offers a very long operational life of 20 million operations. It also is very resistant to environmental influences. Its operation requires only a very slight pressure.

Indication of the door status

The illumination on the terminals clearly signals the user whether the respective door can be used or is locked at the moment. The terminals of the peripheral and the central RJ system with piezo-type key have an illuminated ring around the operating key. The ex-proof terminals have an extra illuminated green/red indicator:

Green: The door is locked, but can be opened by pressing the operating key.

Red: The door is locked. At the moment it cannot be opened. The illumination of the ring will return to green as soon as it will be possible to request the opening by pressing the key.



DICTATOR Interlock Control System - General Information, cont.

The terminals with piezo-type key and transponder of the peripheral and central RJ interlock control system can be combined at will, also on one door. Both models have the same dimensions.

This allows, if necessary, to equip certain areas of the interlock system with an **automatic access control without** needing **additional devices**. The interlock system or parts of it can only be accessed by a restricted group of people.

Transponder



DICTATOR developed terminals for the interlock control system that feature an **integrated access control**. The piezo-type key is replaced by a RFID system. This allows to change authorizations any time and also to attribute different authorizations within one interlock system.

On both sides of each door different authorisations can be programmed.

Instead of pressing the piezo-type key, the door is unlocked by a transponder. The RFID system has been designed so that it can be operated by off-the-shelf transponder chips. The optimum reading distance between terminal and transponder chip is 1 - 2 cm.

Transponder chip requirements

- Frequency: 125 kHz
- Memory: 64 Bit
- Type of chip: EM 4100, EM 4102, EM 4200

Programming

To begin with the three administration transponders are programmed: one delete transponder, admin transponder and master transponder each. As these transponders have different functions, they should have different colours (see below) to be able to distinguish them at once.

Functions of the administration transponders:

Delete transponder: It deletes all programming of a terminal and restores it to its original condition.

Admin transponder: Using this transponder you can program/delete the user transponders per terminal.

General transponder: "Master key" for all terminals on which it has been programmed. It cannot be deleted on single terminals (like the user transponders).

It is recommended to program a set of administration transponders per interlock system (not per terminal!).

After this procedure the system automatically turns into the **operation mode**. Now the user transponders can be programmed (determination of the doors which a user or a group of users may open with the transponder), **max. 99 user transponders** per terminal. By means of the admin transponder it is always possible to delete single user transponders from the access authorisation of single doors. In the event of a power cut all programmed authorizations remain stored.

Indication of the door status

The terminals of the RFID series feature beside the green and red LED also a blue LED.

Green/Red: The function of the green and red LED corresponds to the illuminated ring of the piezo-type keys (see preceding page).

Blue: The blue LED informs by different blinking sequences or the duration of the illumination about the operating state of the terminal. This way it also controls the training and programming process of the different transponders.



DICTATOR Interlock Control System - General Information, cont.

The interlock control system is a very flexible system. Without needing a time-consuming new programming, the complete interlock control system can easily be adapted to changing requirements.

"Programming"



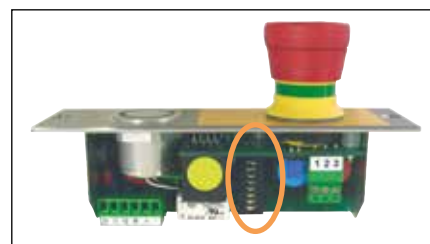
One of the **main features** of the DICTATOR interlock control system is the **very easy "programming"** of the relations between the doors. No computing skills at all are needed.

All relations are adjusted by DIP switches.

The **peripheral version** features these DIP switches **directly in the control terminals**. In the **central systems** they are placed **on the circuit boards in the central controller**.

The relations between the doors can be adapted any time. It is also easily possible to later enlarge the interlock control system.

More detailed information and a programming example can be found on page 08.009.00.



On the same circuit board (either in the control terminal or in the central controller RJ) you can adjust by means of a potentiometer the time during which the door will remain unlocked, i.e. the door can be opened after the operating key has been pressed or the transponder has been held in front of it. It is of no importance whether the door is really opened or not. The period to be adjusted depends on whether it is an interlock for people or material.



Emergency-Open Switch

The door terminals of the peripheral and the central interlock control system are available either with just an operating key or with an additional **emergency-open switch**.

In case of an emergency the door can be unlocked by pressing the emergency-open switch even while being locked by the interlock control system. The switch remains locked after having been pressed. In order to reactivate the interlock control system the emergency-open switch has to be unlocked by turning. After a short delay the system is ready to work again.

If necessary, the emergency-open switch can be protected by an extra cover against unauthorised use (cover prepared for a lead seal, see page 08.045.00).

Two different emergency-open functions are possible:

- **Local emergency-open (LNA)**: unlocks only the door of the respective terminal.
- **Global emergency-open (GNA)**: unlocks all doors of the group.



DICTATOR Interlock Control System - General Information, cont.

The DICTATOR interlock control system is a modular system which can also integrate non-system components. Depending on the chosen version it also offers a great variety of additional possibilities.

Some of the options mentioned in the following are not possible in the system for switch range SP. Details about this version and the possible options can be found beginning on page 08.027.00.

Locking Devices

To lock interlock doors bar magnets, electric strikes etc. can be used. A big choice can be found in the catalogue beginning on page 08.037.00.

But also already installed locking devices can be included in the DICTATOR interlock control system. For this purpose they have to meet the following requirements:

- they have a feedback contact which is closed when the door is closed (if necessary, it can be mounted separately),
- they function with 24 VDC and
- they are locked with current.

Access Controls

Also **external access controls** can be connected to all terminals of the interlock control system. There are two options for their functioning:

- entering the access code automatically releases the door.
- in addition to entering the access code the piezo-type key of the terminal has to be pressed.

Information about an access control system can be found beginning on page 08.057.00.

Access control systems that are already installed, have to have a potential-free make contact (NO) (switching time about 1 sec.).

If possible, the access control system should function with 24 VDC as it then can be fed by the power pack of the interlock control system.

Additional Switches (e.g. Large Surface Switches)

The DICTATOR interlock control system allows also to connect large surface switches or something similar to adapt the interlock control system optimally to the needs of the users. Large surface switches are very convenient when the persons passing through the interlock door have to carry something and therefore don't have empty hands or when they are handicapped.

Integration of Emergency Exits

Interlock control systems often also include emergency exits. These have to be equipped according to the requirements of the EltVTR (German standard for electrical locking systems on emergency exits).

For this purpose DICTATOR has developed as a special component the emergency exit terminal which has been tested and approved by the TÜV Thüringen. This terminal can easily be integrated in a DICTATOR interlock control system.

Door Operators

Especially in clean rooms interlock control systems form part of a production process. There doors often should open automatically. The DICTATOR interlock control system also easily allows to integrate door operators in the interlock system. The door operator should have the following characteristics:

- automatic closing. If not, a separate control device for a closing command is required.
- signal output "door closed" (NO). (If not available, a separate feedback contact has to be mounted.)

Time Control

Depending on the type of the DICTATOR interlock control system there are different possibilities to reopen certain doors of the interlock system only after an adjustable period. This can be achieved in a restricted way by the "Plus" terminals. For more comfortable functions a separate time module is available.



DICTATOR Interlock Control System - General Information, cont.

Depending on the type (peripheral, central) the system can be combined to different extents with facility management systems and a large number of additional functions can be achieved.

The standard version of the DICTATOR interlock control system (peripheral or central RJ) is very easy to mount and connect. No specialist is needed. All intrasystem components are connected by flat cables with RJ45 connectors. Also the power pack is ready for plug-in in a 230 VAC socket.

Discretion Circuit

The interlock control system allows to establish a discretion/delaying circuit for any doors. These doors cannot be opened from the outside even when all other doors are closed, as long as they are locked from the inside by a separate switch to be provided on site (e.g. for undisturbed changing).

Relay Controlled Additional Functions

The control terminals of the peripheral system and the control boards of the central system dispose of different signal outputs/status indications.

They all can be used for transmission to a facility management system.

The peripheral interlock control system allows also for many relay based additional functions. Among these are:

- Starting a ventilation/heating.
- Switching on/off lighting.
- Controlling a pressure compensation.
- Optical/acoustic warning signals.

Number of Doors in Interlock Systems

The DICTATOR interlock control system is also very suitable for smaller interlock systems. Due to its very easy mounting, wiring and "programming" the DICTATOR interlock control system represents an ideal solution to the always increasing requirements regarding hygiene and clean rooms.

The number of doors in the interlock control system depends on the type of the interlock control system.

Peripheral interlock control system

The standard version of the peripheral system has been designed for up to 8 doors. But it also can be used for more doors if the doors can be combined to several groups. At a maximum there can be controlled 8 groups of doors with 8 doors each.

Interlock control system with central controllers RJ and SK

The version with the central controller has been designed for installations with up to 5 doors. But also the central system is very flexible and can be extended to up to 8 doors. But this system requires that all connected doors have to be within the reach of a max. 15 m long cable to the central controller.

SP interlock control system for flush fitted switch boxes or pattresses

The interlock control system for the switch system Jung LS 990 uses the central controller SK which has to be wired on site. The maximum number of doors corresponds to the one of the central system.

We would be happy to work out a free of charge offer with a solution proposal. Just ask us.



Interlock Control System - Programming

The following matrix helps you to determine the position of the DIP switches on the control boards. Just mark for each door which other door(s) may be open at the same time and which one(s) must stay locked (see example below).

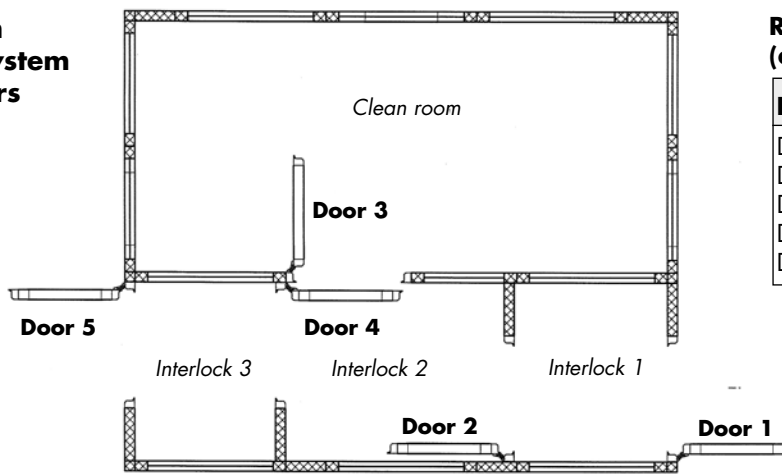
There are 3 positions for the DIP switches:

Position +: defines the door for which the relations are set (basis door)

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

Position 0: this door can be opened even though the "basis door" is open, too.

Clean room interlock system with 5 doors



Required relations (determined by the customer)

Door open	Door locked
Door 1	Door 2
Door 2	Doors 1, 3 and 4
Door 3	Doors 2 and 4
Door 4	Doors 2, 3 and 5
Door 5	Door 4

Matrix for setting the positions of the DIP switches

Door number No. of the basis door	Admissible 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	0
2	-	+	-	-	0	0	0	0
3	0	-	+	-	0	0	0	0
4	0	-	-	+	-	0	0	0
5	0	0	0	-	+	0	0	0
6								
7								
8								



DICTATOR Interlock Control System - Summary

On the following pages you will find detailed information about the different types of the DICTATOR interlock control system and the components which can be used for upgrading the peripheral as well as the central version.



Peripheral interlock control system

Overview	page 08.011.00
Components	page 08.012.00
Control terminals ST3	page 08.013.00
Operating terminals BT3	page 08.014.00
Distribution box	page 08.015.00
Connection cables	page 08.017.00
Order information	page 08.018.00



Central interlock control system

Overview	page 08.019.00
Components	page 08.020.00
Central controller RJ	page 08.021.00
Operating terminals BTZ	page 08.023.00
Operating terminals BT3	page 08.024.00
Connection cables	page 08.025.00
Order information	page 08.026.00



SP interlock control system for flush fitted switch boxes or pattresses

Overview	page 08.027.00
Components	page 08.028.00
SK central controller	page 08.029.00
Operating terminals for switch range	page 08.030.00
Order information	page 08.031.00



Additional components for the peripheral and the central type

Emergency exit terminal	page 08.033.00
Time control unit	page 08.034.00
Mounting accessories	page 08.035.00
Order information	page 08.036.00