



4700 SERIES PLC INTERLOCK CONTROLLER

The 4700 series PLC interlock controller is a self-contained, cost effective controller for operating door interlock and mantrap systems of up to 4 doors or for other industrial control applications. It features 4 independent relay outputs (DPDT). There are 6 digital (ON/OFF) inputs and 1 analog trim pot input available. The 4700 controller is factory programmed to the user's specification.

The complete 4700 controller includes a 4 Amp UL 294 Listed Class 2 power supply and locking metal enclosure.

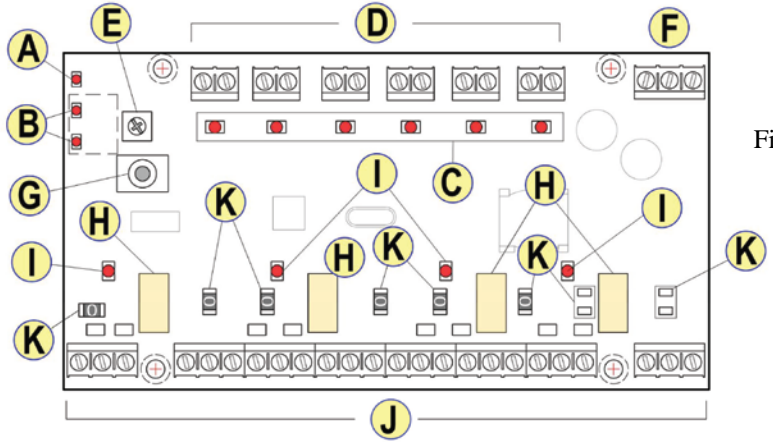


Fig. 1

FIG. 1 The Controller Board

- | | | | |
|---|-----------------------------|---|--|
| A | Watchdog Indicator | G | Programming Port |
| B | Programmable LEDs | H | Relays With TVS Protection |
| C | Input Status Indicator LEDs | I | Relay State Indicators |
| D | Input Terminals | J | Relay Outputs DPDT 2 Amp @ 30 VDC rated |
| E | Analog Adjust Trim Pot | K | Wet contact zero Ohm resistors and pads |
| F | Power IN Terminals | | |



HOOKUP

The 4700 series controller comes mounted in a NEMA enclosure. The standard configuration includes a 12 or 24 VDC (user selectable) 4 Amp UL 294 Class 2 supply with a supervised fire alarm trigger that can be activated by either a normally closed or a normally open circuit.

On alarm, the power supply cuts power to the door locks. The power supply manual shipped with the system has additional details. Power connections are made at the factory.

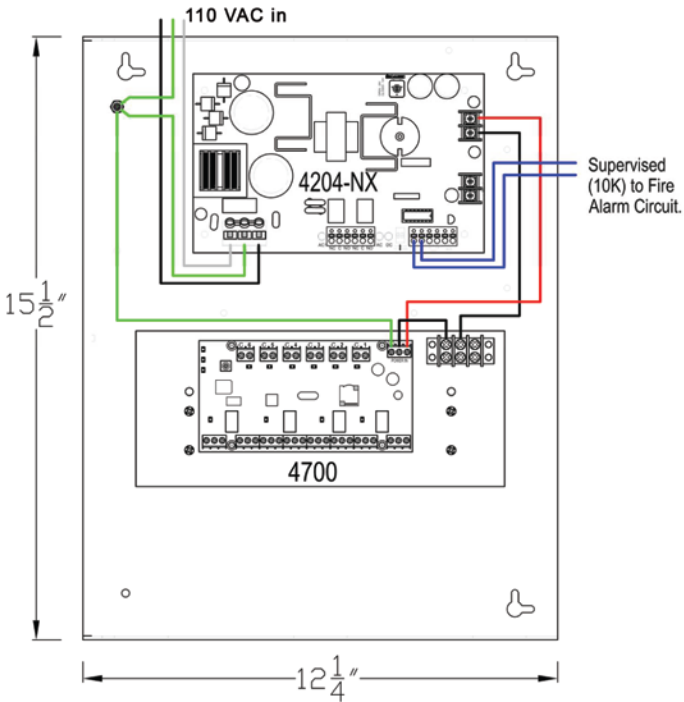


Fig. 2

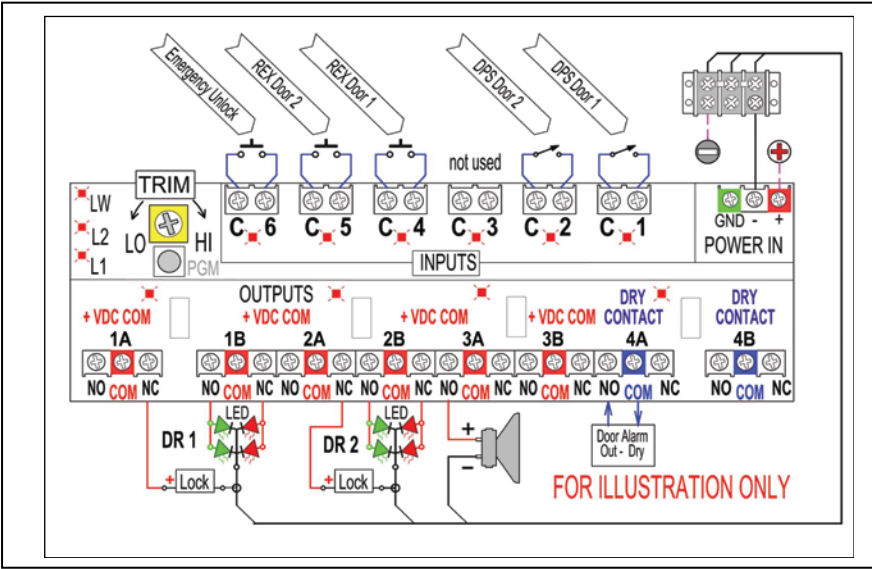


Fig. 3 NOT AN ACTUAL HOOKUP

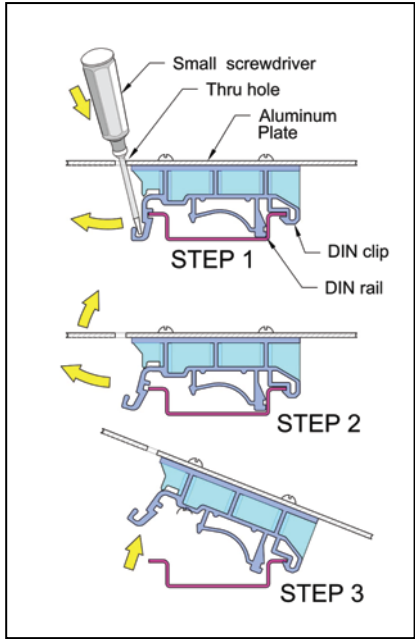


Fig. 4
How to unclip the controller from the DIN rail for wiring.



DOOR POSITION SWITCH

Door switch contacts must be closed when the door is secure. Twisted pair wiring – AWG gauge 22 or larger is recommended.

REQUEST FOR ACCESS (REX) DEVICES

Door unlock time is determined by an external device, typically a card reader, motion sensor, pushbutton or remote console. **Only normally open dry contacts should be used.** Do not apply voltage to a 4700 controller input. AWG gauge 22 twisted pair or larger is recommended. Use sufficient wire diameter to minimize voltage drop over long runs. Use shielded wire for wire runs that pass close to sources of interference such as large motors, network servers, and electromagnetic radiation.

Note that REX inputs may be connected in parallel. Some installations require a card reader for access to a mantrap and a pushbutton or motion detector to exit. Other installations require card in and card out to record occupancy status.

TRAFFIC AND LOCK STATUS LIGHTS

Indicator lights, typically red to show a locked or inaccessible condition and green to show an unlocked or freely accessible condition, may be connected as shown in Figure 2. Note that the red LEDs are typically connected to the normally closed contacts and the green to the normally open.

AWG 22 gauge or larger is recommended for signaling and low-power indicator circuits.

DOOR LOCKS

Maglocks and strikes are connected to the designated relay contacts by labeled screw terminals. To simplify wiring, relays 1, 2, and 3 have wet contacts (common is at supply voltage). Relay 4 contacts are dry (unpowered). Wet contacts can be converted to dry if desired by the removal of the zero-Ohm resistor (K) that passes supply voltage to relay output common. There are 8 zero OHM resistor pads (six are installed in standard configuration). The zero-Ohm resistors are labeled “OUT 1A, OUT 1B, OUT 2A and so on. **NOTE:** One set of contacts for each relay is protected by Transient Voltage Suppressor Diodes. Contacts 1A, 1B, 1C, and 1D have TVS protection. An inductive load (mag lock, electric strike, solenoid etc.) should only be connected to outputs with a TVS.

Connect Maglocks to the normally closed relay contacts and fail-secure electric strikes to the normally open contacts so that the door is unlocked when the associated relay is energized. Fail-safe strikes (unlocked when power is removed) should be connected to the normally closed contacts. Use wire of sufficient diameter and rating to minimize voltage drop, especially over long wire runs. AWG 18 gauge is recommended for power circuits. Fail safe relay operation (relay energizes to lock) is available by request. The factory default is fail secure – the relay energizes to unlock. Mag locks are inherently fail safe when there is an interruption in power.

DOOR ALARM

A DPDT relay is provided on 3 and 2 door 4700 controllers to alarm on an interlock violation. Some controllers also feature a second powered output than can be used to operate a local audible alarm. Wiring should be sized according to the signaling load.

PANIC EGRESS OPTION

Most 4700 controllers shipped from stock have an emergency egress function independent of the Fire Alarm Relay on the power supply. The Panic release unlocks all doors regardless of door status. It is typically used to override the interlock if a door position switch fails, for an environmental or medical emergency or other reason requiring immediate egress.

To enable the Panic release, install a maintained contact normally open switch at the terminals shown on the drawing for the system being installed (usually terminal C6). The doors will unlock for as long as the switch contacts are closed. The Door Alarm Relay (on all 2 & 3 door systems) will energize to alert others to the unsecured condition.

Building codes vary by location. The installer is responsible for understanding and working in compliance with all local codes and regulations as defined by the governing authority.



TESTING

Indicator LEDs (C) at each input make it easy to verify input wiring. The LED glows when the input circuit is closed. There is no need to ring out the input wiring with a continuity meter. Similarly, an energized relay is indicated by a lighted LED (I). It is possible to quickly compare input states with expected output states. All standard programs energize the lock relay to unlock the door. Temporarily short REX inputs to simulate a valid card read or pushbutton activation.

WATCHDOG LED (A) AND SYSTEM IDLE LED (B)

The watchdog LED (see Fig 1) blinks rapidly (3 times per second) when a program is loaded and is executing correctly. If the watchdog indicator is not blinking, verify that there is 12 or 24 VDC at the correct power terminals. If power is present and the watchdog indicator is not blinking, or blinking slowly, contact Dortronics for technical assistance.

When all doors are closed, there are no requests for access and alarms are silent, **LED 1** lights to indicate the system is idle and ready. If a door is unlocked or open, or Panic or Door Alarm is active **LED 2** (Fig. 2) lights to show the system is busy. If the system is busy when it shouldn't be, re-check the input connections. Make sure locks and Door Position Switches are not cross-wired.

ANALOG TRIM POT (E)

A single turn trim pot is available for setting timing delays and other variable inputs after installation. The function and adjustment range must be specified by the customer prior to ordering. Typical uses include: airlock equalization delay, Unlock time, door propped alarm delay, timed exit from mantrap, panic release unlock time. Virtually any time value or range requirement can be accommodated, although fine adjustment over an extreme range is not practical.

CUSTOM PROGRAMMING

The 4700 can be custom programmed at the factory to virtually any logical sequence requiring 6 inputs and 4 outputs.

TROUBLE SHOOTING

Before calling Dortronics Technical Help (800-906-0137) make sure the Watch Dog LED is flashing at a constant rate of 3 times per second. Verify that door position inputs are lit showing that doors are closed. If a door is closed, but the input light is not lit, check the wiring with a multi-meter. Open and close the doors to verify that the input light goes out when the door opens and goes on when the door is closed.

Check to make sure the alarm relay is not energized. If it is, the system thinks there is an interlock violation or the Panic input is active. Re-check door switch wiring and verify each door is connected to the correct input.



RECOMMENDED EQUIPMENT	DORTRONICS PART #
1200 lb electromagnetic 12/24 VDC maglocks with built-in door position switch.	1110xD
Electric Strike 12 or 24 VDC adjustable with integral door switch	3300xD
High intensity Red / Green LEDs on single gang S/S wall plate.	7201xL2-H
High intensity Red / Green LEDs with piezo sounder on double gang S/S wall plate.	7202xL2-HxCS

OPTIONS	USEFUL ADDITIONS FOR ENHANCED SECURITY	
Lock Status Indicators	For either side of a controlled door. LEDs typically follow lock status - red for locked and green for accessible. LEDs can share lock power.	7201xL2-H
Door Prop Alarm	Local Door Alarm	7281-EA
Security Breach Alarm	Additional relay outputs to operate Dortronic piezo sounder on single gang S/S wall plate (or add xCS option to LED Indicators).	7201xCS
Custom Applications	In-house design and prototyping services available for unusual requirements	

Specifications	Qty	Description	Remarks
Power In		12 or 24 VDC regulated - plus, common and earth ground	3 - Screw Terminals
Inputs	1	Programmable analog adjust trim pot	Fig. 1-E
	6	Digital 9 - 32 VDC rating use dry contact only	Fig. 1-D
Outputs	4	DPDT Relays rated 2Amps @ 30 VDC - .5 Amps @125 VAC	TVS protected
Current draw		4700 PCB (No load) 160 mA @ 12VDC	
Temperature		Operating 32-140° F	
Dimensions		2.9"W x 5.5" H x.75" H	

INTERLOCKS	STANDARD CONFIGURATIONS – CUSTOM INTERLOCKS ARE AVAILABLE BY REQUEST
	Standard Interlocks include a lockable NEMA enclosure and a 4 Amp power supply with Fire Alarm Interface
47211-U	2 doors normally unlocked – alarm out - panic release
47211-LU	1 locked and 1 unlocked door - alarm out
47211-L	2 normally locked doors - alarm out - panic release
47311-U	3 doors normally unlocked – alarm out - panic release - for one room or common space
47311-1LU	3 doors – 1 normally locked – alarm out - panic release – for one room or common space
47311-2LU	3 doors – 2 normally locked - alarm out - panic release - for one room or common space
47311-L	3 doors normally locked – alarm out – for a single room or common space.
47321-US	3 unlocked doors in two rooms– door 2 is shared * alarm out - panic release
47321-LS	3 locked doors in two rooms – door 2 is shared * alarm out
	* If the shared door is open, outer doors are locked. When shared door is closed outer doors can be used simultaneously.



SALES - WARRANTIES

Contact (Sales):

800-906-0137

631-725-0505

Mike Palermo – Sales/Customer Service

Stuart Arthur – Sales/Applications Specialist

Bryan Sanderford - National Sales Manager



Contact (Technical):

Joe Hanna – Engineer/Applications Specialist

Product Warranties:

All electromagnetic locks have a **LIFETIME GUARANTEE** against defects in material and workmanship. Defective units will be replaced or repaired based upon incoming evaluation and inspection.

All other Dortronics components of the Electric Locking System shall be similarly warranted for a period of one year. Expressed warranties are conditionally based on the requirement that the items covered within the guarantee are used and maintained in accordance with the manufacturer's recommendations.

A Return Authorization Number must be obtained and accompany all returns within 14 days of issue. Unused items returned for credit must be complete and packed in original unit box and are subject to a 15% restocking fee. Any shipping or order discrepancies must be reported within 5 days of receipt.



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