

**Turnstar Systems c.c.**

**TURNSTILE & CUBICLE  
CONTROLLER  
TURTL373  
USER MANUAL**

Specifications contained herein are subject to alterations without notice.

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## **1. INTRODUCTION**

This popular low cost, high reliability Turnstile/Cubicle controller looks deceptively simple. Underneath its enclosure there is some powerful electronics that combines many separate complex controllers into one simple unit. This unit has semiconductor switching for high reliability, as well as battery saving features that can extend battery power by up to four times compared to standard controllers.

The advanced Turnstile/Cubicle logic uses the latest technology for a fully programable door controller. This controller can be used as a dual system designed to operate two turnstiles or a single bidirectional Turnstile, Cubical or Mantrap for the control of people. The outputs are fully protected. The wide supply voltage is from 12VDC to 45VDC or 12VAC to 24VAC.

The Solenoid/maglock outputs have a special feature to save battery power. The outputs can adjust the supply voltage to the solenoid from 25%, 50%, 75% to 100% of the supply voltage with high efficiency.

The Auxiliary relays are a separate set of relays with “dry” contacts for various functions. For example: driving the door indicating LEDs or lights. End of transaction for notifying a card reader system that someone has indeed passed through the turnstile. Enabling a card reader in a certain mode. Setting an alarm for forced or illegal functions.

There are a full set of Diagnostic features to enhance setup and fault finding. These features include, cycling and counting facilities.

On top of all these features, the Turnstile logic features are programable from a separate display module.

### **New Features on TL372**

This version has six new features, these are:

- 1) Management mode
- 2) service count down.
- 3) Turnstile man trap mode.
- 4) Motorized cubicle.
- 5) Turnstile with exclusion sensor.
- 6) The auxiliary relay has two new functions. Alarm output and card reader enable.

### **New Features on TL3723**

- 1) The two trigger inputs if activated for 2 seconds will initiate fire mode whereby both solenoids will activate until the inputs return back to non activated mode.

## **2. TECHNICAL DATA**

### **2.1 Functional data**

Hold time	1 to 999 seconds including infinity
Input triggers	Selectable open/close, memory on/off, normally open/closed and Edge/Level triggered
Visual indication	Red LED solenoid active Green LED solenoid active
Outputs	Solenoid drivers 3,5A @ 24VDC
Mode	Push button on PCB
Surge Protection	200mA Resetable fuse

### **2.2 Electrical Data**

Power requirements	12VDC to 24VDC $\pm$ 15% 10mA max solenoids off or on 35mA max per secondary relay The Solenoid output is short circuit protected.
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### **2.3 Environmental Data**

Operating temperature	-40°C to 85°C
Humidity	Up to 95% relative humidity without condensation.
Circuit protection	Conformal coating over PCB

### **2.4 Mechanical Data**

Mounting Position	DIN rail, Plug or shelf mounting
Connections	11-pin Sub-magnal type
Dimensions	76mm(L) by 40mm(W) by 70mm(H)
Weight	125g approx.

## **3. OPERATING INSTRUCTIONS**

### **3.1 Hardware setup**

The TURTTL373 Turnstile/Cubicle controller is designed to be plug in or shelf mounted with visual indicators.

### **3.2 Front Panel Indicators**

If Solenoid 1 (Clockwise) is active the Top red LED will turn on.

If Solenoid 1 is short circuited then the Top red LED will flash slowly.

If Input trigger 1 the Top yellow LED will turn on.

If Limit 1 the Top green LED will turn on.

If Solenoid 2 is active the Bottom red LED will turn on.

If Solenoid 2 is short circuited then the Bottom red LED will flash slowly.

If Input trigger 2 the Bottom yellow LED will turn on.

If Limit 2 the Bottom green LED will turn on.

### **3.3. Entering Program mode**

- 1) Plug the display module DM300 into the turnstile logic.
- 2) Press the Up, Down and the Mode button simultaneously.
- 3) Release all of the buttons.

#### **3.3.1 Program Settings Selections**

It will not be necessary to reset the unit after altering the program settings. The unit will do it automatically.

#### **3.3.2 Limit switch 1 & 2 settings.**

Press the Up and the Mode button simultaneously to move to the next section.

"Limit 1" or "Limit 2" plus the previous setting will be displayed.

- OE N/O contact Pulse triggered.
- OL N/O contact Permanent triggered.
- CE N/C contact Pulse triggered.
- CL N/C contact Permanent triggered.

### 3.3.3 Trigger 1& 2 functions

Press the Up and the Mode button simultaneously to move to the next section.

"In 1" or "In2" plus the previous setting will be displayed. The following options are available:

- tOE N/O contact Pulse triggered.
- tOL N/O contact Permanent triggered.
- tCE N/C contact Pulse triggered.
- tCL N/C contact Permanent triggered.
  
- tHOE Bidirectional turnstile mode N/O contact Pulse triggered.
- tHOL Bidirectional turnstile mode N/O contact Permanent triggered.
- tHCE Bidirectional turnstile mode N/C contact Pulse triggered.
- tHCL Bidirectional turnstile mode N/C contact Permanent triggered.
  
- tSOE Bidirectional turnstile with exclusion sensor N/O contact Pulse triggered.
- tSOL Bidirectional turnstile with exclusion sensor N/O contact Permanent triggered.
- tSCE Bidirectional turnstile with exclusion sensor N/C contact Pulse triggered.
- tSCL Bidirectional turnstile with exclusion sensor N/C contact Permanent triggered.
  
- tNOE Mantrap turnstile mode N/O contact Pulse triggered.
- tNOL Mantrap turnstile mode N/O contact Permanent triggered.
- tNCE Mantrap turnstile mode N/C contact Pulse triggered.
- tNCL Mantrap turnstile mode N/C contact Permanent triggered.
  
- COE Cubicle mode N/O contact Pulse triggered.
- COL Cubicle mode N/O contact Permanent triggered.
- CCE Cubicle mode N/C contact Pulse triggered.
- CCL Cubicle mode N/C contact Permanent triggered.
  
- CSOE Cubicle with sensor mode N/O contact Pulse triggered.
- CSOL Cubicle with sensor mode N/O contact Permanent triggered.
- CSCE Cubicle with sensor mode N/C contact Pulse triggered.
- CSCL Cubicle with sensor mode N/C contact Permanent triggered.
  
- CNOE Motorized Cubicle with sensor N/O contact Pulse triggered.
- CNOL Motorized Cubicle with sensor N/O contact Permanent triggered.
- CNCE Motorized Cubicle with sensor N/C contact Pulse triggered.
- CNCL Motorized Cubicle with sensor N/C contact Permanent triggered.

### **3.3.4 Solenoid 1 & 2 as normally energised or de-energised.**

Press the Up and the Mode button simultaneously to move to the next section.

"SOL 1 SA18" or "SOL 1 SE18" to display. The current setting will be displayed.

Selecting "SOL 1 SE18" will ensure the output is normally de-energised. The solenoid is only energised when the turnstile is triggered to open.

Selecting "SOL 1 SA18" will ensure the output is normally energised. The solenoid is only de-energised when the turnstile is triggered to open.

To change the solenoid voltage. Press either the left or right buttons to change the voltage from 1V to 31V. For example SA18 = 18V, SA24 = 24V.

When switching the solenoid on the initial voltage is always the full power supply voltage. After two and a half seconds the voltage will drop to the lower voltage. This gives the solenoid time to activate. Once the solenoid is active the solenoid only need a small amount of power to keep it active.

### **3.3.5 Count 1 & 2 function**

Press the Up and the Mode button simultaneously to move to the next section.

"Count 1" or "Count 2" will be displayed with the previous hold time. This time will be displayed in seconds.

This is a useful function for a lift where the lift is limited to a certain number of people.

This count facility allows a number of people set by this count to occur then lock the turnstile thus preventing an excessive number of people in the lift.

This count is reset by means of a switch connected to a special display module. The default count is set to 0. This is the safe setting when in doubt.

### **3.3.6 Delay time 1 & 2 functions**

Press the Up and the Mode button simultaneously to move to the next section.

"Dly 1" or "Dly 2" will be displayed with the previous delay time. This time will be displayed in seconds.

This delay inhibits the trigger from working for a set time after the last completed transaction on solenoid.

This function is to delay the number of transaction over time for what ever reason, whether it is for a security application where by every person needs to be searched.



### **3.3.7 Solenoid 1 & 2 hold time**

"Hold 1" or "Hold 2" will be displayed with the previous hold time. This time will be displayed in seconds.

The Holding time can now be set by pressing the left button to reduce the time and the right button to increase the time. By selecting infinity time will turn the holding timer off. The maximum selectable time is 999 seconds.

### **3.3.8 Auxiliary Relays functions**

Press the Up and the Mode button simultaneously to move to the next section.

"Rly EOT" or "Rly Dir 1" will be displayed.

"Soun" indicates the Relay will activate for 1/4 second when a input is triggered to activate a solenoid/maglock. This feature is used to indicate to the user the door is open.

"EOT" stands for End Of Transaction. The relays will pulse close for a period of 1/4 seconds once a transaction of the turnstile is completed.

"Dir 1" indicated the direction of the turnstile or the present action of the turnstile. The relay will close the contacts when the solenoid is active in that direction and open again once the solenoid is de-energised.

"Dir 2" indicated the direction of the turnstile or the last action of the turnstile. The relay will close the contacts when the solenoid becomes active. The relay will open the contacts when the other solenoid becomes active in the other direction.

"Soun" indicates the turnstile is open and the person can enter.

### **3.3.9 Relay pulse time**

Press the Up and the Mode button simultaneously to move to the next section.

"Rly1 1.00" will be displayed.

The Relay pulse time can now be set by pressing the left button to reduce the time and the right button to increase the time.

### **3.3.10 Buzzer on/off**

Press the Up and the Mode button simultaneously to move to the next section.

"Soun" will be displayed with the previous on / off setting.

This function turns the internal buzzer on or off. This does not turn the buzzer off on power up. This buzzer is to notify the turnstile user that the turnstile is now open.

### 3.3.11 External display default settings

Press the Up and the Mode button simultaneously to move to the next section.

"Std Count" will be displayed as the previous default setting.

“Std Count” Will display the count on the display for example: “Count 1 10”

“Std nane” Will display alternately the count and a second later display “Turnstar”

“Std Count” Will display the various counts in the following order “Count 1”,

“Cnt total”, “Ant total”, “Cnt daily”, “Ant daily”.

“Std nane” Will display alternately the count and a second later display “Turnstar”

### 3.4. Switch settings

On the back of the controller where the pins jut out there is a 5Way bank of switches called the DIP switches.(Dual in Line). These switches are used to override the program settings for the pulse (edge) triggered and permanent(Level) triggered, Normally energised(Safe) and normally de-energised(Secure mode) solenoids and lastly the buzzer on/off.

## **4. Management mode**

This is a special mode whereby the manufacturer can set certain functions with a few simple steps.

To enter this mode, plug the Display module DM300 into the turnstile controller. Press all the display buttons simultaneously for ten seconds.

### **4.1 Factory default**

"Dflt Y N" will be displayed.

This function put the default settings back to a safe functional turnstile mode.

Press the left button to set the default settings and the right button to miss this section.

### **4.2 Count reset**

Press the Up and the Mode button simultaneously to move to the next section.

"Crst Y N" will be displayed.

This section clears all counts.

Press the left button to clear the counters and the right button to miss this section.

### **4.3 Service count reset**

Press the Up and the Mode button simultaneously to move to the next section.

"Srst Y N" will be displayed.

This section clears the service count down so the turnstile/cubicle can function again..

Press the left button to clear the service count and the right button to miss this section.

### **4.4 Service count set**

Press the Up and the Mode button simultaneously to move to the next section.

"Set" will be displayed. With the service count value.

This section sets the service count for the next turnstile/cubicle service.

## **5. Diagnostics**

On power up Solenoid 1 status will be displayed.

For example: "Sol 1 On", "Sol 1 OFF" & "Sol 1 triP".

Pressing the right button on the display module will move the diagnostics th the Solenoid 2 section. This section is the same as the Solenoid 1 section.

By pressing the right button again counter 1 will be displayed.

After one second the actual count of counter 1 will be displayed.

By pressing the right button again counter 2 will be displayed.

After one second the actual count of counter 2 will be displayed.

### Reset able counts

By pressing the right button again counter 1 will be displayed.

After one second the actual count of counter 1 will be displayed.

By pressing the right button again counter 2 will be displayed.

After one second the actual count of counter 2 will be displayed.

In the count modes if you press the left/down button the relative count will be displayed. This count is reset able. To reset this count, press the left button for 10 seconds. The count will then display 0.

## **6. INSTALLATION**

### **6.1. Mechanical mounting**

This unit is normally mounted on a DIN rail or fastened directly to a chassis via an 11pin connector.

### **6.2. Wiring up**

The wire to be used is preferably 0,5mm multi-strand wire that will give sufficient strength and current capability.

## **7.0. CONFIGURATION**

### **7.1 PINOUTS**

PIN NUMBER    FUNCTION

1	Entry Solenoid output
2	Exit Solenoid output
3	DC negative supply
4	Entry End of Transaction output
5	Exit End of Transaction output
6	End of Transaction common
7	12V to 24V DC positive supply
8	Exit Limit input
9	Entry Limit input
10	Exit trigger input
11	Entry trigger input

## **8. APPLICATIONS**

The Turnstile logic is a dual system designed to operate two turnstiles a bidirectional turnstile or a cubical.

Built in counters for audit control saves wiring up expensive external counters. The internal non re-setable counters keeps count of the following.

The maximum count is up to 100 million per counter.

## **9. FAULT ANALYSIS**

### **9.1. Initial diagnostics.**

Check the unit for power. If this unit's power is less than 11VDC it will not work. It will assume the battery is too flat.

### **9.2. The Top red LED lights up.**

This normally indicates that the Solenoid 1 is active.

### **9.3. The Bottom red LED lights up.**

This normally indicates that the Solenoid 2 is active.

### **9.4. The Top LED blinks slowly.**

This normally indicates that the Solenoid 1 current is too high. Test the solenoid for short circuiting or check the wiring for a fault.

### **9.5. The Bottom red LED blinks slowly.**

This normally indicates that the Solenoid 2 current is too high. Test the solenoid for short circuiting or check the wiring for a fault.