FCC Part 15
433.92 MHz Transmitter Certification
& 372 MHz Receiver Declaration of Conformity

Test Report

FCC ID: KJ8-TID372R2
FCC Rule Part: 15.231

ACS Report Number: 03-0263-15C231

Manufacturer: Wayne-Dalton Corporation
Equipment Type: RF Controlled Garage Door Opener
Model: Operator 41XR (Torsion *i*drive™)
Model Variants: 3651-372, 3652-372, 3750-372, 3751-372, 3752-372, 3771-372

Theory of Operation

The Torsion *i*drive™ is an electromechanical garage door operating system intended for residential use. This operator system is consists of three main parts: 1.) The "light kit" which mounts to the ceiling; 2.) The "header operator" which mounts directly above the garage door; 3.) The garage door itself. The light kit is a separate unit and has been evaluated as a luminary and is covered as a Listed Accessory. The light kit contains no circuitry that that is needed for the proper operation of the door operator; there is no electrical connection between it and the door operator. The light kit receives a radio frequency transmission from the operator for on/off activation. The operator connects to the branch circuit via a detachable power supply cord or by permanent wiring means. The header operator contains a 120 V dc drive motor and a logic control board. The doors themselves should be considered part of the Listed product since they form part of the obstruction sensing system.

The door's counter-balance system is mechanically linked to a slide potentiometer, which relates the position of the door to the microprocessor and serves as the inherent entrapment protection system. The control board is provided with a microprocessor that monitors the motor current sensing circuit. The software allows the downward force of the closing door to reach a maximum of 25 lbs. only if sensors are attached to the operator (in compliance with UL 325, 5th ed. Paragraphs 32.1.2b and 42.3). If the photo-eyes are not connected, the software will only allow a maximum 15 lbs. downward force before stopping and reversing the door (in compliance with UL 325, 5th ed. Paragraph 46.1.1). The software is designed to comply with the requirements of UL 1998.

The photoelectric eye safety sensors serve as secondary entrapment protection devices. The operator's control circuit monitors the external entrapment protection device including the wiring to it, so that any failure of the device will cause a closing door to open and prevent the system from automatically closing the door. However, for security purposes, the operator is designed so that constant pressure on the control will close the door even if the external devices fail. The inherent entrapment protection is still operational during the attended closing and the remote control unit is inoperative for closing the door. This operator is provided with a conventional red emergency release handle. The doors are not directly mechanically linked to the doors and the system is compliant with the exception to UL 325, 5th ed. Paragraph 32.4. However this operator is provided with a mechanical releasing mechanism.

The unit is not provided with adjustable open/ close force limits. The operator employs a self-learning force limiting feature. This feature continually monitors the amount of force needed to move the door at various positions during door travel. An incremental offset or force cushion is added to this measured force, and the result is stored in the operator memory. During the next door travel, the actual force needed to move the door is compared to the "door profile" value stored in the memory (actual force from the last travel plus small cushion). If the force needed to move the door exceeds the stored value, the operator treats this as an obstruction and reverses a closing door or stops an opening door. This system results in the operator providing a force of only that which is needed to move it, plus a small offset to account for minor fluctuations in required force due to door condition, climatic conditions, etc. This feature is considered an additional redundant system since the door position potentiometer (indicating door position) is considered to be the secondary entrapment protection system.

This operator can be provided with a variety of accessories for convenience purposes such as various radio transmitters, wireless keyless entry system, etc.

The 433.92 MHz transmitter on board, is used to activate a wireless light kit to turn on household lights when the garage door is activated. When the operator receives the normal 372MHz signal to open the door or the wired push button is depressed, a signal is sent to the 433.92MHz transmitter to send a command to activate the wireless light kit. The 372 MHz transmitter and 433MHz receiver are approved separately and are not included in this filing.

The 433.925 MHz transmitter activates under the following conditions:

- Upon reception of a light toggle command from a 372.5 MHz transmitter.
- Upon reception of a door move command from a 372.5 MHz transmitter or external manual switch.
- Approximately ten seconds after reception of a door move command from a 372.5 MHz transmitter or external manual switch (upon completion of a door cycle).
- Approximately five minutes after a door cycle ends (5-minute timer to turn off light).

The EUT is designed to transmit only when the transmitter is activated and ceases to operate within the 5 second requirement of 15.231(a)(2). The EUT transmits a single 43.2mS burst of forty five 600uS pulses as shown in the timing diagram below in figure 1:

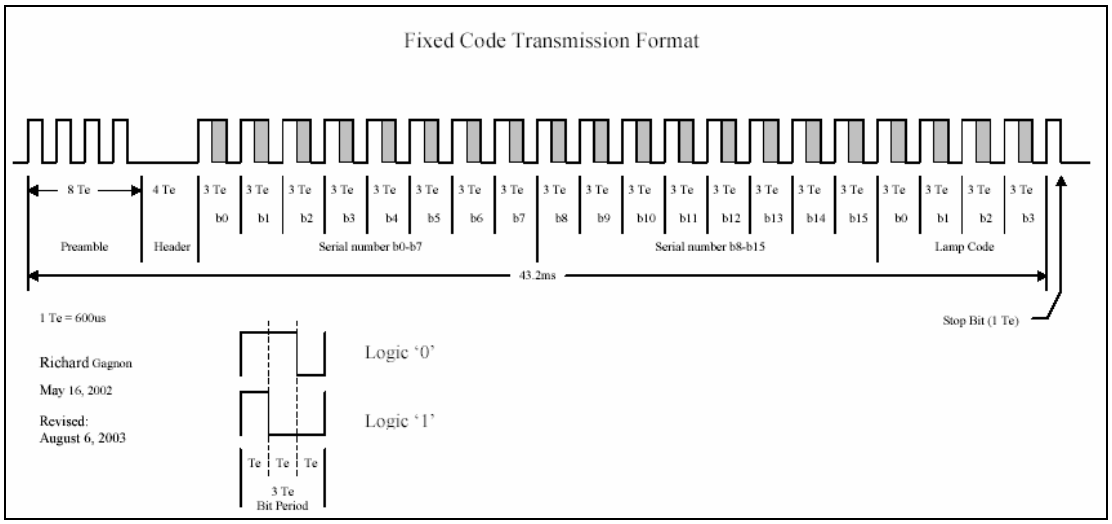

Figure 1: Single Transmission Timing Diagram

The Torsion *i*drive ™ is offered in 8 packaging variants as defined below:

- Model #: 3660-372 retail
- Model #: 3661-372 retail 4-pack
- Model #: 3662-372 retail Sam's Club
- Model #: 3663-372 retail 4-pack
- Model #: 3740-372 dealer 120 cycle (operator ceases unless paid for before 120 cycle operations)
- Model #: 3760-372 dealer 4-pack
- Model #: 3761-372 dealer
- Model #: 3762-372 dealer remanufactured