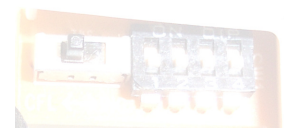


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### Revision History

Revision	Date	Initiator	Description
A	March 18, 2009	D Wilcher	Initial Spec

**Scope:** This document establishes the performance, design, test, and acceptance requirements for the above Electronic Control Module (ECM). Any deviations from this specification must be obtained, in writing, from the Supplier. If requesting a component change to the specification, a sample of the new component must accompany the request. This Product Specification meets the requirements established in Hunter Fan's R&D-22 Electronic Fan Control NPD Procedure Rev 0 document.

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## I. GENERAL DESCRIPTION


The Universal Remote Control is the 27185 Handheld Remote with identical operating features for Ceiling Fan and Lighting Control Operations. The Universal Remote Control (Model Number 27227) shall also have the ability to select between CFL or Incandescent Light Bulbs using a small “slide” toggle switch packaged inside of the Battery Compartment. The default setting for the slide toggle switch shall be in the CFL position. The operating frequency for the Universal Remote Control shall be 350MHz and be compatible with the wireless Receiver Controller Part Number 84368 for Ceiling Fan and Lighting Control Operations.

## II. Benefits

The Universal Remote Control shall provide all the convenience of Ceiling Fan and Lighting Control operations in the standard 27185 package. Also, an Energy Assisted feature of selecting CFL Light Bulbs shall make the Universal Remote Control a “Green” Product by reducing the amount of power being wasted as compared to an Incandescent Light Bulbs, thereby saving dollars (\$\$) for the purchaser. **Figure 1** shows the Universal Remote Control.



**Figure 1.** The 27227 Universal Remote Control

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### III. Functional Specifications

The Universal Remote Control shall operate exactly like the current 27185 Handheld Remote managing the following feature/function sets.

**A. Fan Control** – A Total of 4 Buttons shall be used to initiate Fan Control functions.

- 1) OFF Function: (Toggling of one Button)
- 2) Three Speed Motor control: (Three Independent Buttons: Low, Medium, and High). See **Figure 2**

**B. Lighting Control** – One Button shall be used to initiate Lighting Control functions.

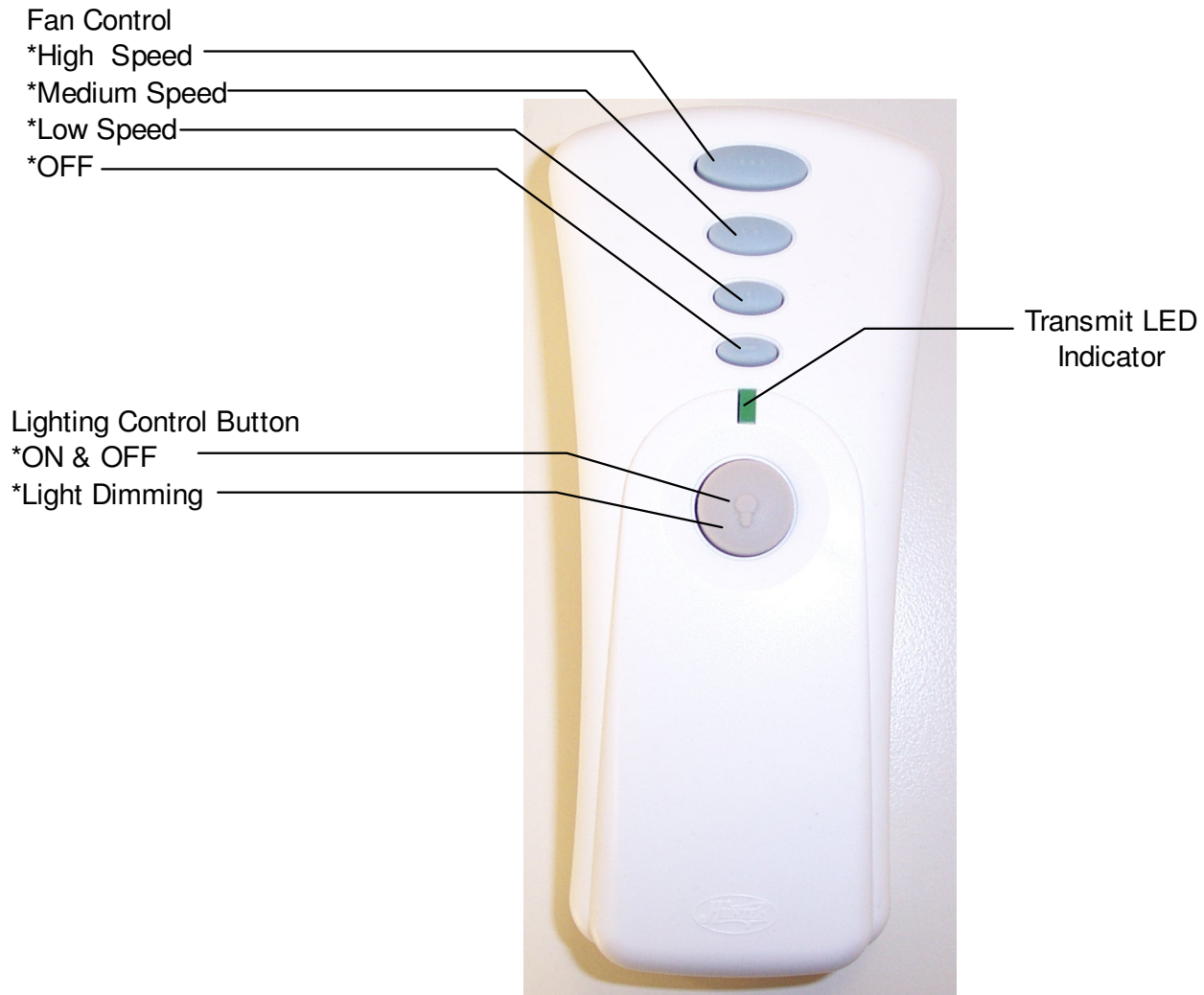
- 1) ON & OFF Function: (Toggle of one Button)
- 2) Light Dimming: ( Press and Hold of one Button) See **Figure 2**

**C. Transmit LED Indicator** – A small red LED shall be used to visually display Fan and Lighting Control commands initiated by pressing the appropriate buttons. See **Figure 2**

**D. CFL to Incandescent Control Mode** – A small slide toggle switch shall be used to switch between CFL and Incandescent Light Bulbs. While in the CFL Control Mode, there shall be no light dimming function available with the Light Button pressed. The small slide toggle switch shall be located in Battery Compartment of the handheld remote. The default setting for this switch shall be in the CFL position. See **Figure 3**

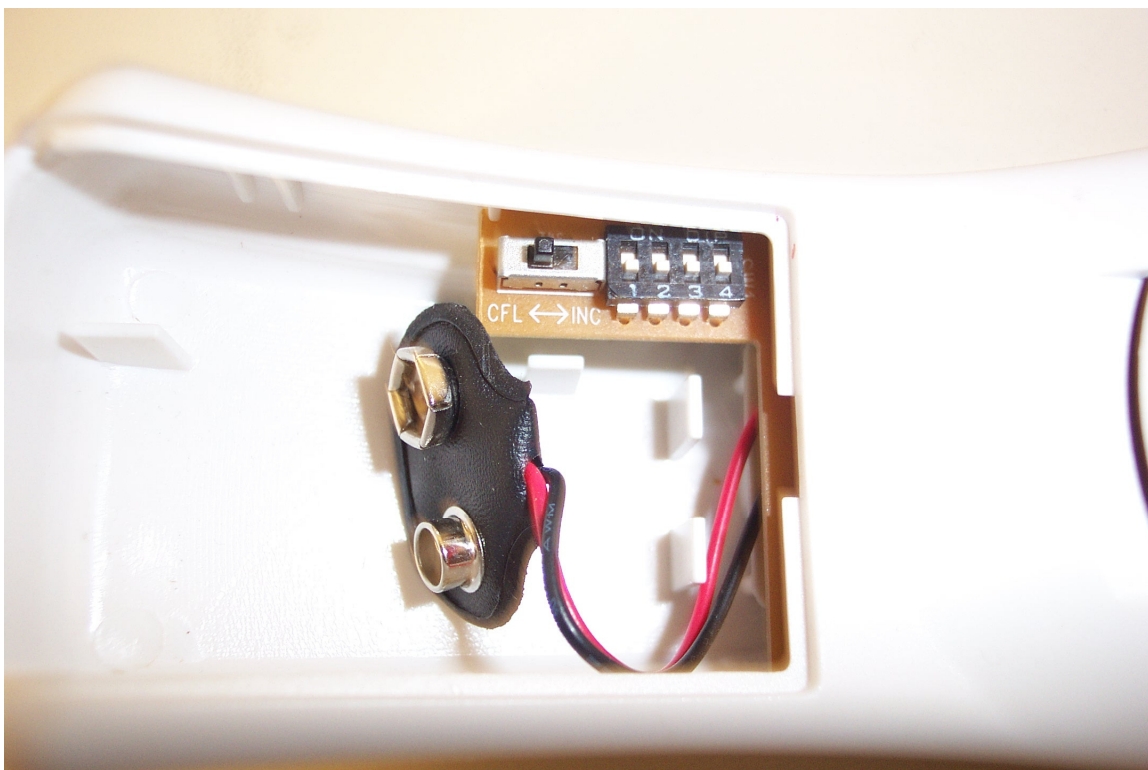
**E. Power Interruption Feature** – Upon 120Vac Line Voltage within a residential home being interrupted due to electrical disturbances (Ex. voltage spikes or lighting strikes) of the Power Grid and or the Main Circuit Breaker Panel, the lights shall stay turned OFF once power has been properly restored.

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**Figure 2.** Layout of Fan and Lighting Controls Universal Remote Control


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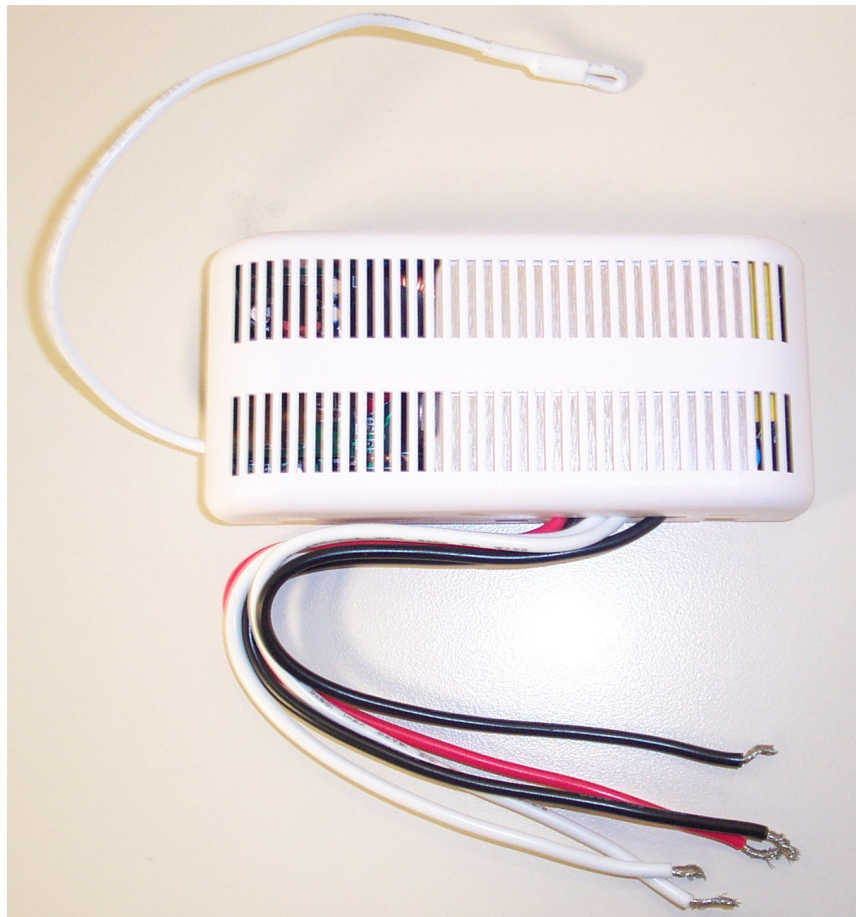
**Figure 3.** Location of CFL-Incandescent Toggle Switch in Battery Compartment. The default setting of the switch shall be in the CFL position. The DIP Switch is used for ID Addressing for pairing a Ceiling Fan with a Universal Remote Control





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The 27227 Universal Remote Control shall be able to work with the existing the **84368** (Soap Bar) receiver controller. See **Figure 5**. The existing circuit schematic diagram for the 84368 Receiver Controller is shown in **Figure 6** for reference.

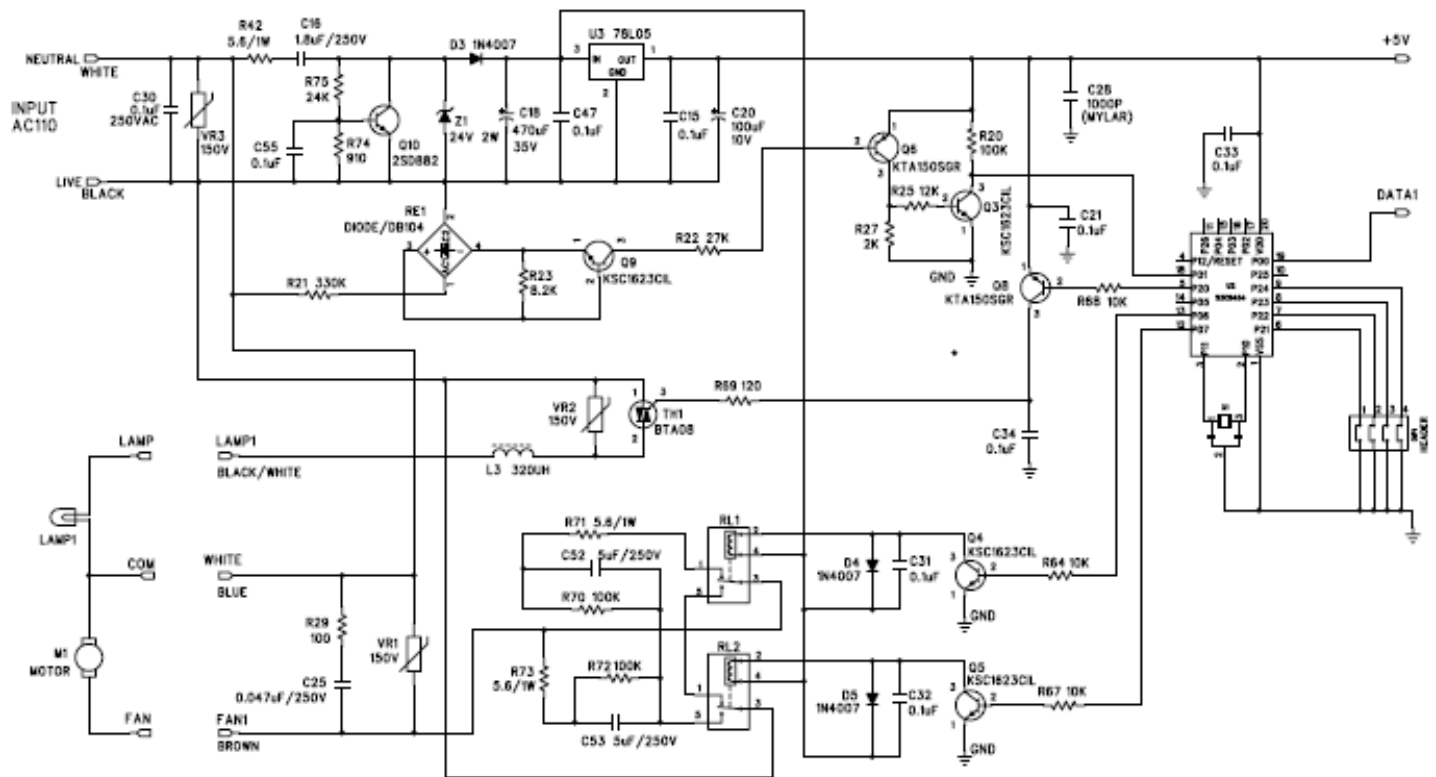


**Figure 5.** The Existing “Soap Bar” Receiver Controller Part Number 84368




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Reference Design



**Figure 6(c).** Circuit Schematic Diagram for the existing 84368 Receiver Controller (Soap Bar): Fan and Lighting Control Circuits


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## V. Electrical Specifications

- A. Supply voltage: 12VDC: GP23AE Battery.
- B. Use 100nF Bypass capacitors for power pins of digital, analog, microcontroller, and E<sup>2</sup>PROM IC components and 10nf capacitors for ESD and transient suppression at the Input/Output (I/O) pins of the respective semiconductor components.

## VI. RF Specifications

- A. The operating RF (Radio Frequency) for the 27224 Handheld Remote shall be 350MHz.
- B. The following transmission range for handheld remote shall be :
  - 1. Receiver located on bench in the lab >60'
  - 2. Receiver assembled in ceiling fan > 40'
- C. The remote controls transmission circuit shall use a SAW (Surface Acoustic Wave) resonator.

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## **VII. Mechanical Specifications**

The Universal Remote Control electronic subcircuits, battery, toggle & DIP switches, and control buttons shall be packaged into the existing plastic housing of the 27185 Handheld Remote.

## **VIII. Regulatory Specifications**

Units will conform to UL 1917

## **IX. Environmental Specifications**

- A. Celsius Operating conditions: 0° to 85° Celsius inside the fan housing /Control Switch Housing. A 95% RH shall be maintained as well
- B. Storage: -40° to 85° C

## **X. Quality**

- A. The development of this product must adhere to the latest revision of Hunter Fan Company Control Product Approval Plan
- B. Quality Parameters: All products must be fit for function. Any deviations from the Product Specification will be considered a defect and will cause rejection of the product by Hunter Fan Company. First Article Inspection reports will be submitted to Hunter Fan for all parts & tools. A complete first article packaged unit to be accepted by Hunter Fan Engineering & Quality and archived.
- C. Product life expectancy is 5 years, based on 8000 hrs usage per year.
- D. Quality Inspection: The product shall comply with the requirements in the previous sections and shall be checked by the Standard Audit Procedure for Controls supplied by Hunter Fan Company Quality. Hunter Fan Company Engineering and Quality may amend the procedure at any time.

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- E. Cosmetics: The product shall meet the Hunter Fan Company Aesthetic Requirements document QA-AR.
- F. Workmanship: All parts shall meet the latest revision of IPC-A-610, "Acceptability of Electronic Assemblies".
- G. Packaging: TBD Marketing.
- H. Performance: Any deviation from these requirements is considered a critical defect and will require immediate corrective action.
- I. Drawings: All piece parts used in the manufacturing of the product must meet the dimensions and the specifications outlined on their respective piece part drawings. A set of drawings will also be kept at Hunter Fan Company. All drawings will include material and applicable performance specifications for the given part, and include all information in English. Dimensioning units and tolerances will be clearly shown on the drawings.
- J. Literature: All instructions, warranty cards and other literature shall be legible, complete, in place and free of blemishes, tears, color mismatch, blank pages, wrinkles and contamination.
- K. Reliability: The packaged product must meet the National Safe Transit Association Drop Test.
- L. Material Certification: Vendor must supply a Material Certification of Compliance for all critical components. Components cannot deviate from design without approval of Hunter Fan Company.

## **XI. Design Test Requirements**

### **A. Life Testing**

A Sample size of 30 units must survive ALT equivalent to 40000 hours.

### **B. HALT (Highly Accelerated Life Testing)**

1. A sample size of 10 units must survive Halt Testing for 2 week duration.

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2. A sample size of 10 units shall be subjected to the following tests:

- Cold Thermal Step Stress:..... -20 °C (-4 °F)
- Hold Thermal Step Stress:.... >+110 °C (+230 °F)
- Rapid Thermal Transition:..... 35 Grms (Gravity Root Mean Squared)
- Vibration Step Stress: ..... 35 Grms

## **XII. Factory Test Requirements**

According to RD-20, section III.

## **XIII. Warranty Period**

One year.

## **XIV. Safety**

- A. Agency Requirements: All units must conform to the appropriate government, Underwriter's Laboratory and/or International Test Agency requirement for intended country of sale. Agency requirements are specific to both the product in question and the country where it is sold. Products intended for commercial or industrial use must conform to OSHA standards where applicable.
- B. Where applicable, this product must conform to the Hunter General Control Specification F4049.

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## XV. Packaging

- A. Unit: Per Marketing instructions.
- B. Bulk: Per Marketing instructions.
- C. Enclosures: Per Marketing instructions.
- D. Physical Packaging: The physical design of the internal packaging and external dimensions and materials are to be design by the vendor, and approve by Hunter Fan Engineering. Any packaging artwork is to be supplied by Hunter Fan Company.
- E. Pallet Stack Requirement: Per Marketing instructions.
- F. Markings and Labels
  - G. Labels: All markings are either permanently ink stamped, silk-screened, or provided on a UL- recognized material and labeling system preprinted or die-stamped foil type suitable for application to the surface involved, rated 60 °C
    - 1. Unit model label includes
      - a. Hunter name, logo and address
      - b. Part number
      - c. Country of origin
    - 2. Supplier code
    - 3. Date code: WWYY. The date code is located in a clearly visible location.



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## **XVI. Engineering Changes**

Any changes need to be requested according to the latest revision of Hunter Fan Company engineering document QA R&D-5 for ECRs.

## **XVII. Critical Components**

- A. FR4 PCB
- B. Tactile Switch Decoder IC (Holtek: HT-12E)
- C. Saw Resonator (Frequency: 350MHz)
- D. Tactile Switches (Momentary: x4)
- E. Red LED
- F. PCB Loop Antenna
- G. DIP Switch (4 Bit)
- H. Battery: (12VDC –GP23AE)
- I. Bypass Capacitors (100nF & 10nF)
- J. Tactile Switches Input Diodes (x7)
- K. Zener Diode (Voltage Regulation)
- L. Op-Amp (LM358)
- M. Tuning Coil Inductor

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## **XVIII. Reference Documents**

- A. Hunter General Control Specification F4049
- B. Hunter R&D-22 Electronic Fan Control NPD Procedure Rev 0
- C. Hunter RD-20 test procedure
- D. Test Request Form F4086
- E. Standard Audit Procedure, QA-FG
- F. National Safe Transit Association Drop Test
- G. UL/FCC/IC Certification Reports, to be completed by Hunter
- H. Artwork, to be completed by Hunter Fan Company
- I. UL and C-UL Std. 1917.
- J. Hunter Fan Company PAP R&D-9
- K. Hunter Fan Company Aesthetic Requirements document QA-AR
- L. Hunter Fan Company QA R&D-5
- M. EMC Performance, Latest IEC 61000 Standards