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NC341 Clock/Timer

Operation, Installation and Service Manual

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The NC341 Clock/Timer is designed for use as a general-purpose clock and digital timer. The clock/timer incorporates an alphanumeric display to allow for text prompts. This device is intended for use primarily in incremental and decremental timing applications with panel and remote inputs.

Operation, Installation and Service Manual

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A Word about ESD (Electrostatic Discharge)————

What Is It? Static electricity is a result of triboelectric charging of two dissimilar nonconductive materials that are rubbed together, such as rubbing your feet on a carpet on a cold winter day or in a dry climate. The resulting charge is detected when you reach out to touch a doorknob or some other metallic object. The resulting discharge may only be startling or, in severe cases, it may even be painful. The actual electrical charge is dependant on the materials being rubbed together, humidity, the rate of separation, and other factors.

What Can It Do? While this effect may be disturbing to humans, the effect on electronic equipment is often more serious, ranging from operational disruption to actual component damage. These effects result from the high voltages that may be developed. The simple act of walking across a carpet may develop as much as 30,000 volts, and changing a bed sheet may create a charge of 100,000 volts or more. Such voltages readily cause arcing (the spark that can be observed when you grab a doorknob after walking across a carpet, etc.). The arcing is evidence of the discharge path. Due to the high voltage involved, the discharge current can jump to any nearby metallic or non-metallic object. If the discharge is to or through an electronic device, such as a nurse call system, the operation of the device may be affected. If the discharge current passes through internal components, these components may be damaged or their operation degraded.

What The Installer Can Do: In humid climates or in places where the relative humidity is kept at 65% or greater, there will likely be few problems with ESD. Where problems may occur the following measures can be taken.

- Ground all exposed metal surfaces. Grounding should be to a #16 gauge or larger conductor.
- Install nurse call system wiring in metal conduit. This conduit may be used to ground panels.
- Use shielded cable for nurse call system station-to-station wiring. The use of open conductors invites inductive coupling of discharge currents, which can cause the same problems as direct discharge currents.
- Ground your body before handling system components. This can be done by using a wrist strap, or simply by contacting a grounded metal surface. Use caution to avoid hazardous voltages while grounded.

Installers must take care to discharge themselves before handling system components. This can be done by touching a grounded metal surface. To avoid a shock when discharging static electricity on the body, hold a metal object, such as a key, and use that object to contact the grounded surface.

This information is provided to make you aware of ESD problems so that precautions may be taken to avoid damage and disruption of system operation.

System Introduction ————

The NC341 Clock/Timer is a combination digital clock and elapse/countdown timer. Clock functions may be displayed in 12 or 24-hour modes. All time and timer functions are displayed in hours, minutes and seconds. In addition to the clock and timer functions, the NC341 is capable of displaying alpha character operational prompts. Because of these features the NC341 can be implemented in a wide variety of applications.

All programming and settings are accomplished with the four pushbuttons on the faceplate of the device. In addition, there are contact closures contained behind the cover so that timer functions may be actuated from peripheral devices. The NC341 may be powered by 120VAC by means of an external transformer or by any 18 VDC-power supply. In both scenarios current is to be limited to <1A.

Operating Instructions

This section provides complete operating instructions for the NC341 Clock/Timer, as well as reference drawings for use in locating and describing all controls and indicators. System operators must read the following operating instructions concerning equipment and the terms used in conjunction with the equipment.
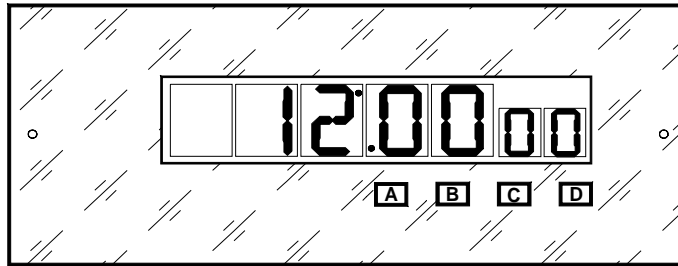
Function Buttons

Figure 1—NC341 Clock/Timer Controls

These buttons control most system functions, and are described below:

A—Return to and set clock mode.
B—Elapsed timer display. *Set hour for clock display.*
C—Start incremental timer. *Set minutes for clock display.*
D—Start decremental timer. *Toggle 12/24 hour mode for clock display.*
Note: Comments in italics require a combination of button presses.

Setting the Clock

After power-up, the display will read **T T O N E**. Press **BUTTON A** to start the clock function at 1:00 a.m.

To set the hour, press and hold **BUTTON A** and then press **BUTTON B** to increment the hour. The clock initially displays in 24-hour mode (i.e., 1:00 p.m. is displayed as **13:00**).

To set the minutes, press and hold **BUTTON A** and then press **BUTTON C** to increment the minutes.

To toggle between 12-hour and 24-hour modes, press and hold **BUTTON A** and then press **BUTTON D**. When in 12-hour mode, a red dot in the lower right corner of the display indicates "p.m." When in 24-hour mode (military time), the letter "m" is displayed on the left.

Incremental Timer Function

Initialize the timer by pressing **BUTTON B**. The display will read **E 0:00.00**.

Start the "count up" by pressing **BUTTON C**.

Stop the timer by pressing **BUTTON B**.

To clear the timer, press and hold **BUTTON B** and then press **BUTTON A**. The display will read **T T O N E**. Press **BUTTON D** so that the display reads **R E S E T**. Press **BUTTON A** to return to clock mode.

Decremental Timer Function

Initialize the timer by pressing **BUTTON B**. The display will read **E 0:00.00**.

Set the "beginning time" by pressing and holding **BUTTON B**, and then press **BUTTON C** to adjust the hours, and **BUTTON D** to adjust the minutes.

Start the "countdown" by pressing **BUTTON D**.

Stop the timer by pressing **BUTTON B**. Resume the countdown by pressing **BUTTON D**. When the countdown time reaches **00:00.00** the display will read **tm-up**.

To clear the timer, press and hold **BUTTON B** and then press **BUTTON A**. The display will read **T T O N E**. Press **BUTTON D** so that the display reads **R E S E T**. Press **BUTTON A** to return to clock mode.

Timer Operation Via Peripheral Switch

An external switch can be connected to the NC341 in order to control timer activity from a remote location (see installation instructions). When installed correctly, toggling a remote switch will control the incrementing timer.

To activate this feature, press and hold **BUTTON B** and then press **BUTTON A**. The display will read **T T O N E**. Press **BUTTON C** once so that the display reads **C C - O N**. Press **BUTTON A** to return to clock mode.

In this scenario, when the NC341 Clock/Timer is connected to a maintained switch, the timer will continue to count up as long as the switch is made. Releasing the switch will stop the incremental timer. To clear the timer, press and hold **BUTTON B** and then press **BUTTON A**. The display will read **T T O N E**. Press **BUTTON D** so that the display reads **R E S E T**, and then press **BUTTON A** to return to clock mode.

Installation Instructions

Step 1: Read the following information prior to installing the NC341 Clock/Timer. The installer must be familiar with the system and its installation requirements and guidelines.

Step 2: Determine the equipment locations.

Step 3: Install wiring as per manual specifications.

Step 4: Install the NC341's housing.

Step 5: Use ohmmeter to check for shorts and grounds in system wiring.
NOTE: This is a critical and necessary step to avoid installation problems later.

Step 6: Connect the NC341 to the desired power source.

Step 7: Perform a full operational test of the Clock/Timer.

Step 8: Train system operators.

Equipment Description, Requirements and Location

Locate the NC341 Clock/Timer in accordance with the following information. The installation of all system equipment, cabling and enclosures must be in accordance with the National Electrical Code (ANSI/NFPA 70-1999), the Healthcare Facilities Code (ANSI/NFPA 99-1999), and all applicable state and local codes. If remote button support is not provided for *all* functions, the NC341 *must* be located where the user can access the control buttons.

Mount the NC341 using a TekTone® OH600 back box, or another appropriate mounting box. Minimum clearance from current carrying parts to dead metal parts must be no less than 0.5". The operating environment for the NC341 is 10–40°C. Relative humidity should not exceed 80%.
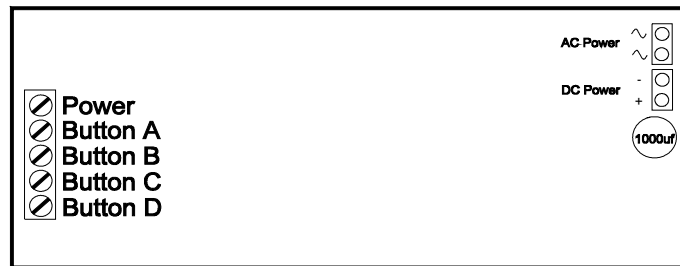

Figure 2—Back of NC341 Circuit Board

The NC341 Clock/Timer can be powered by either AC or DC, but at no time should both sources be used. Current must be limited to <1A. For AC operation, use an isolation transformer that provides 16 VAC. For DC operation, use an 18 VDC power supply. When using DC power, the polarity designations (+/–) on the terminals must be adhered to.

The terminal strip on the back of the circuit board has connections that correspond to the buttons on the front panel. A maintained switch between the power terminal and the **BUTTON C** terminal is required to use the Clock/Timer feature.
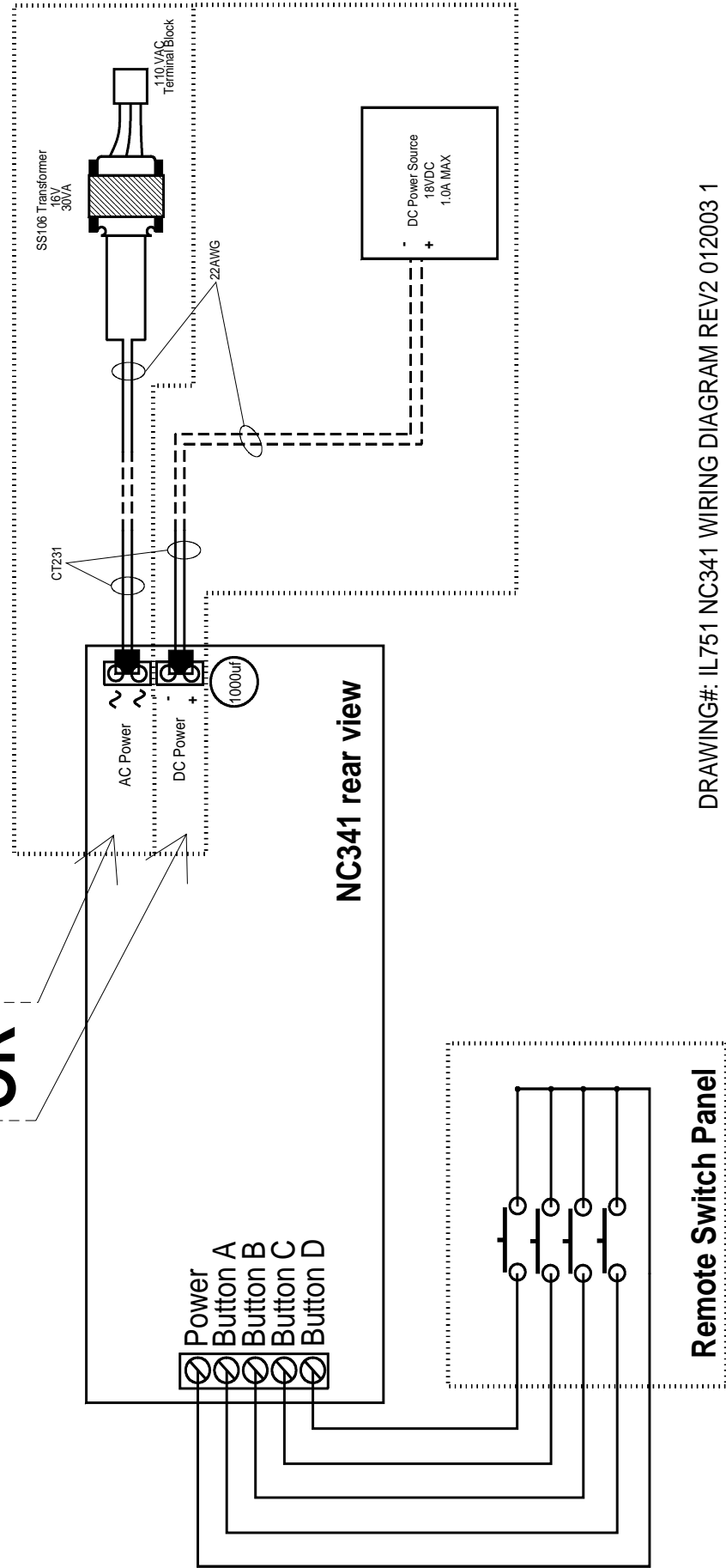
A momentary switch between the power terminal and any one of the button terminals will exactly mimic the operation of the corresponding switch. In this way, the NC341 Clock/Timer may be mounted out of reach, using remote switches to operate the device.

Figure 3—NC341 Wiring Connections

Notes:

1. An extra 2-pin connector (with no wires) is included to cover the unused header for protection purposes.

2. The flying red and yellow leads on the back of the board are provided for a future feature and must be isolated and left disconnected.

110 VAC Terminal Block

SS106 Transformer 16V 30VA

22AWG

DC Power Source 18VDC 1.0A MAX

CT231

1000uf

AC Power

DC Power

OR

NC341 rear view

Power
Button A
Button B
Button C
Button D

Remote Switch Panel

DRAWING#: IL751 NC341 WIRING DIAGRAM REV2 012003 1