AE21 SERIES

DISPLAY CONTROL TERMINAL

APPLIED TECHNICAL SYSTEMS

DESCRIPTION

The AE21 Series Display Control Terminal is used for implementing various display functions. It consists of a control terminal, the AE21, and one or more remote displays. The AE21 is a menu-driven controller which can quickly and easily be operated. Simply scroll through the menu and follow the prompting on the alpha-numeric display. The menu offers such choices as setting the time, count up elapsed timer, count down elapsed timer, display numbers, or display messages. Once a menu selection is made, the display will prompt the user for the needed input.

The AE21 terminal can be connected to as many as 50 remote displays at distances of up to 2000 feet away using a simple two-conductor cable such as Belden 8442. The remote displays, however do require local power to illuminate the digits.

For the most economical remote displays, the CC2000 Series Four-Inch, Four Digit Displays (same as the CC2000 Series System Clocks) are ideal for the AE21 Display Control System. Additional models are available for two, three, four, five, and six-digit remote displays using the AE Series Large Displays with the Option 354 installed. These models are available with 1", 2.3", 4", 8", or 12" high digits, which are visible from 5 feet to 500 feet away. Refer to the AE21 Series brochure for more detail.

Applications include clock system control for factories, buildings, schools, hospitals etc. Other applications include elapsed timer control for production lines, cycle timers, sporting events and various other uses. It can also be used to display production quotas, nursery call systems for churches, order is ready systems for restaurants, now serving systems, truck to dock systems etc. Call for service displays to apply to such applications.

SPECIFICATIONS

AE21 TERMINAL

Operating voltage:	12 VAC @ 500 mA maximum. A plug-in 120 VAC to 12 VAC power module is provided.
Output Signal:	Two-Wire RS232 signal which is compatible with ATS CC2000 Series Displays and AE Series Displays with Option 354 installed. A ten-foot signal cord is provided for connection to the user's wiring.
Enclosure:	Black, ABS plastic, sloping front, desktop enclosure with rubber feet measures 5"W x 5.4"L x 1.59"H.
Keyboard:	Clearly labeled, 16-Key, positive action keyboard for data entry and control.
Display:	16 character, alphanumeric LCD display with a back-light.

CC2000 SERIES DISPLAYS

Operating voltage:	120 VAC 6 to 8 VA maximum depending on the model. Optional 24 VAC powered units are also available. Clearly labeled pigtail lead wires are provided.
Input Signal:	Receives a Two-Wire RS232 signal from the NF21 Terminal. Clearly labeled pigtail lead wires are provided.
Enclosure:	Black, ABS plastic, wall mount, 2-sided wall mount, and 2-sided ceiling mount enclosures are available. Dimensions: 12"W x 6.1"H x 3.5"D. A white, painted metal, flush mount enclosure is also available. Mounting brackets and/or hardware are provided, depending on the model. See the drawings at the back of this manual for your specific model number.
Display:	Four, Four Inch high, bright red LED, digits. Visible up to 150 feet away.

AE SERIES DISPLAYS

AE Series Displays are available in sizes ranging from 1" high to 12" high digits, however for this application only the displays with 4", 8" and 12" high digits are typically used. Any of the two, three, or four digit, AE Series models with option AE-OPT-354 installed (RS232 Input) can be used with the AE21 System.

Operating voltage:	Standard power for the AE Series Displays is 120 VAC, 6 to 50 VA maximum, depending on the model. Optional power is available. Clearly labeled pigtail lead wires are provided.
Input Signal:	AE-OPT-354 provides an RS232 input for the AE Series Displays so they can receives a Two-Wire RS232 signal from the AE21 Terminal. Clearly labeled pigtail lead wires are provided.
Enclosure:	The standard enclosure for the AE Series is a Black, anodized aluminum wall mount enclosure. Optional flush mount, 2-sided wall mount, 2-sided ceiling mount, and NEMA rated enclosures are available. Mounting brackets and/or hardware are provided, depending on the model. See the drawings at the back of this manual for your specific model number.
Display:	Four-Inch, Eight-Inch, and Twelve-Inch high digits are available in two, three, and four digit models. Visible from 5 feet to 500 feet away. See the drawings at the back of this manual for your specific model number

INSTALLATION

AE21 TERMINAL

The AE21 terminal sits flat on any desk much like a small desktop calculator. Clearly labeled power and signal jacks are provided on the back panel of the terminal.

SIGNAL WIRING

A 10 foot cable with A 3.5 mm phone plug is provided for the RS232 output signal from the AE21 Terminal to the wiring for the remote displays (supplied by others). Plug this cable into the Signal jack on the back panel of the terminal. The other end of the cable has two stripped ends for connection to the two-conductor cable of the remote displays.

POWER WIRING

BE SURE ALL SYSTEM WIRING IS COMPLETE
BEFORE APPLYING POWER TO THE AE21 TERMINAL.

A power module (ATS P/N 0900-7015) is provided for powering the terminal. Plug the power connector from the power module into the Power jack on the back panel of the terminal. The other end of the power module can be plugged into a standard 120 VAC power outlet.

Refer to the wiring diagram provided.

CC2000 SERIES REMOTE DISPLAYS

MOUNTING

CC2000 Series Remote Displays are available in several types of enclosures, including wall mount, flush mount, double sided wall mount and double sided ceiling mount. Mounting brackets and hardware are provided depending on the specific model. See the CC2000 / AE Series Mounting Bracket Instruction page. See the drawing at the back of this manual for more detail on your specific models.
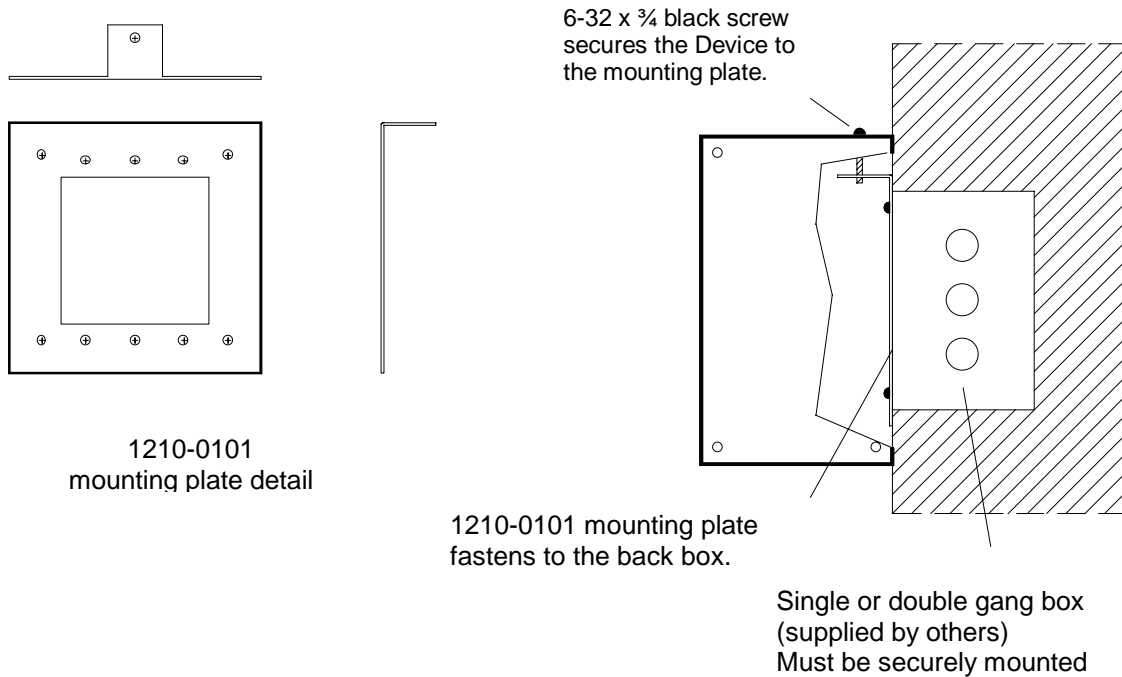
WIRING

The CC2000 Series Remote Displays are usually powered by 120 VAC. Clearly labeled, pigtail lead wires are provided for all power and signal connections. See the AE SERIES wiring diagram for more detail. All wiring must be done to meet local codes.

CC2000 / AE SERIES MOUNTING BRACKET INSTRUCTIONS

MOUNTING

The C2000 and AE Series Displays can be mounted in a variety of ways. Things to consider for mounting include ambient light, viewing area, ambient temperature, dirt or dust. Most wall mount models are supplied with one or more 1210-0101 mounting brackets for wall mounting to a single or double gang box. See the detail below. For other mounting options, such as ceiling mounts or double-sided mounts, refer to the specific drawings.

6-32 x ¾ black screw
secures the Device to
the mounting plate.

1210-0101
mounting plate detail

1210-0101 mounting plate
fastens to the back box.

Single or double gang box
(supplied by others)
Must be securely mounted

WIRING

There are many wiring configurations, depending on the functions used and the options installed.

On most standard units, clearly labeled pigtail leads wires are provided for the power at the back panel of the unit. Additional pigtail leads are provided for the RS232 Input signal. See the wiring diagrams for more detail at the back of this manual.

OPERATION

APPLYING POWER

Before applying power, be sure all field wiring is completed to meet all local codes. Apply power to the AE21 Terminal by plugging the power module into the 120 VAC power outlet. Apply power to the remote displays, which are normally hardwired to a circuit breaker controlled circuit. The remote displays will rotate during the power on self-test. A version number will appear for a few seconds. Then all remote displays will be blank. The AE21 Terminal will display a version message during it's power on self-test:

> AE-21 Ver. 2.00

MAIN MENU

When the self test is complete, the terminal will display the message:

> Start? Press "D"

The system is now ready for use. To enter the main menu, simply press "D" (Display Menu), and continue to press "D" (Display Menu) to scroll through the AE21 functions:

> 1)   Set TIME

> 2)   CountUp E.T.

> 3)   CountDown E.T

> 4)   Display No's

> 5)   Display MSG's

To select an AE21 function, simply press "A" (Advance) when the function is being displayed or press the corresponding number for that function.

SETTING THE TIME

Enter the " 1) Set TIME " function by pressing "A" (Advance) when displayed, or by pressing "1" at any time the main menu is being displayed. The terminal will now prompt the user to choose 12 Hour or 24 Hour format. To select 12 Hour format press "1", or for 24 Hour format press "2".

```
1=12Hr   2=24Hr
```

Next the time must be entered in Hours and Minutes. Enter the correct Hours, then press "A" (Advance). Enter the correct Minutes, then press "A" (Advance) again.

```
12:34   Press A
```

If 12 Hour format was chosen you will be prompted for AM or PM. To select AM simply press "1", and for PM press "2". (The following display is not shown for 24 Hour format)

```
1=AM   2=PM
```

Once the time is ready to be set, press "A" (Advance).

```
Press  A  to  set
```

Timekeeping begins the instant you press "A" (Advance). If at any time during the time setting sequence an entry or selection was incorrect, press the "#" (Exit) key to exit the sequence.

COUNT UP ELAPSED TIMER

Enter the " 2) CountUp E.T. " function by pressing "A" (Advance) when displayed or by pressing "2" at any time the main menu is being displayed. Once the selection is made, the AE21 prompts for the "A" to be pressed to set the timer to zero and begin counting up elapsed time. Note: The hardware configuration for two, three, four, and five digit displays will determine if whether will display Hours and Minutes or Minutes and Seconds.

```
A = Reset & Start
```

After pressing "A" (Advance), the main menu is displayed again and the displays will continue to count up until another command or message is transmitted. There are no start or stop controls for the count up timer.

COUNT DOWN ELAPSED TIMER

Enter the " 3) CountDown E.T " function by pressing "A" (Advance) when displayed or by pressing
"3" at any time the menus are being displayed. Once the selection is made, the timer prompts for
a preset value from which to begin counting down elapsed time. Enter the desired Hours,
Minutes, and Seconds for the preset value, being sure to press "A" (Advance) after the Hours,
Minutes, and Seconds. The maximum countdown value is 99:59:59. The cursor will not advance if
an improper value is chosen.

```
┌─────────────────────────────┐
│      12:34:56  Press A       │
└─────────────────────────────┘
```

Once the Seconds are entered and "A" is pressed, the Count Down PresetTime will be displayed
on all remote displays and the terminal will prompt and await the users commands. Press "1" to
start the countdown and press "2" to reset to the preset amount.

```
┌─────────────────────────────┐
│       1=Start   2=Reset      │
└─────────────────────────────┘
```

Once the count down has been started, the terminal will prompt for the users commands. Press
"1" to stop the countdown and press "2" to reset to the preset amount. The numbers on the
remote display will flash when stopped by the AE21 terminal.

```
┌─────────────────────────────┐
│       1=Stop   2=Reset       │
└─────────────────────────────┘
```

To reenter a preset value at any time, press "B" (Back) and enter the time in the same manner as
previously done. To exit the countdown menu, simply press "#" (Exit) at any time to return to the
start menu. Note that exiting the menu once countdown has started will not stop it, it will continue
to run until another function or message is transmitted.

DISPLAY NUMBERS

Enter the " 4.) Display No's " function by pressing "A" (Advance) while displayed or by pressing "4"
at any time the menus are being displayed.   The terminal will now prompt for six digits to be
displayed. Note: If using a two, three, four, or five digit display, the first two, three, four, or five
digits entered will be displayed. Type the 6 digits desired and press "A" (Advance) to display them
on the remote displays. If only using the first four digits, simply press "A" (Advance) after the 4th,
5th and 6th digit to display the first four digits. To change a number entered before pressing "A"
(Advance) press "B" (Back) to back-up to the desired digit and change it as needed.

```
┌─────────────────────────────┐
│      123400   Press A        │
└─────────────────────────────┘
```

To exit the "display numbers" menu, press "#" at any time to return to the start menu.

DISPLAY MESSAGES

Enter the " 5) Display MSG's " function by pressing "A" (Advance) while displayed or by pressing "5" at any time the menus are being displayed. There are three messages available to be displayed. The messages may be viewed by scrolling through the choices by pressing "D" (Display Menu), in the same fashion as the main menu.

```
┌─────────────────────────┐
│     FIRE   Press A      │
└─────────────────────────┘
```

```
┌─────────────────────────┐
│     bELL   Press A      │
└─────────────────────────┘
```

```
┌─────────────────────────┐
│     HELP   Press A      │
└─────────────────────────┘
```

When the desired message is shown on the terminal, press "A" (Advance) to display the message on the remote displays. Note: On six digit models the message will be seen on the first four digits. To exit the "display message" menu press either "B" (Back) or "#" (Exit) to return to the main menu.

INSTALLATION

TECHNICAL SUPPORT

For any questions concerning installation and operation of this product, contact our factory at:

PHONE (800) 444-7161
OR
FAX (318) 797-4864

SERVICE POLICY

It is recommended that all service for this product be done by the factory or by a factory authorized service representative. Applied Technical Systems will provide ongoing service support in and out of warranty. Send your repairs to:

APPLIED TECHNICAL SYSTEMS
849 KING PLACE
SHREVEPORT, LA 71115

APPLIED TECHNICAL SYSTEMS
WARRANTY POLICY

ATS warrants its products to be free of defects in material and workmanship for a period of 24 months from the date of purchase. ATS will repair or replace any product returned to its authorized factory service center within the warranty period so long as there is no evidence that the product has been abused, misused, damaged by lightning, overloads of any kind or water, or altered in any way.

Products returned for warranty must be returned with freight prepaid. ATS will pay normal freight charges to return the product to the customer. Special premium freight requested by the customer will be charged to the customer.

ATS disclaims any warranties expressed or implied, including merchantability and/or fitness for a particular purpose. In no event shall ATS be held liable for incidental or consequential damages.