

AP22

PROGRAMMING MANUAL



RTC Manufacturing, Inc.

TABLE OF CONTENTS

PROGRAMMING MANUAL

Introduction	1
Installation Overview	1
Programming Features	1
Programming Introduction	2
Programming Sequence	2
Primary Programming Function Keys	3
Programming Instructions	4
Program Time-Of-Day	4
Program the Date	5
Program the Day-Of-Week	6
Program Daylight Saving Time	6
Program Day Plans	7
Clear the Program in a Day Plan	8
Program the Default Week Plan	9
Program Annual Plans	10
Clearing Annual Plans	11
Transfer a Program	12
Manual Control	12
Wiring Harness Color Charts	13

PROGRAMMING RECORDS

Day Plan 1	14
Default Week Plan	14
Annual Plan Record	15
Day Plan 2	16
Day Plan 3	17
Day Plan 4	18
Day Plan 5	19
Day Plan 6	20
Day Plan 7	21
Day Plan 8	22
Day Plan 9	23

COMMON SCREEN COMMANDS

Instructions	24
Manual Control	24
Set Time	24
Day-Of-Week	24
Daylight Saving Time	24
Annual Plan Program	25
Day Plan Setup	25
Default Week Plan Setup	25
Date Setup	25
Time Switch Address	25
GPS Status	26
Time Zone	26
Daylight Saving Time (DST) Debug	27
Start Time	27
Modem Time	27
Modem Power	27
Sunrise and Sunset Time	28
Latitude and Longitude	28
Read GPS Coordinates	28
Data Clear	28
Data Transfer	29
Reset the AP22	29
Status	29
Version	29
Clear Annual Plans	29
Clear Day Plans	29

CONVERTING AP22 SOFTWARE TO RTC CONNECT™ SOFTWARE

31

WARRANTY

30

INTRODUCTION

The AP22 is a two-circuit, AC or DC (12VDC) powered, calendar programmable solid state time switch used for switching electric circuits according to a preset time and date program. The AP22 is primarily designed for school zone and traffic control use where multiple daily/weekly programs are required on an annual basis.

INSTALLATION OVERVIEW

The AP22 may be attached by using the keyhole tab on the back of the enclosure. Two mounting holes on the inside of the enclosure and below the circuit board are accessible for additional support.

Outdoor use of AP22 requires installation in a NEMA Type-4 cabinet. Indoor installations do not require a weather-tight enclosure.

Physical Dimensions:	10.375" H x 4.75" W x 2" D including harness
Weight:	approximately 3 pounds
Operating Temperature:	-30° to +74°C

PROGRAMMING FEATURES

10 DAY PLANS — Day Plan 1 is the default day plan that will control time switch operation during the normal week timing plan. The other day plans will control time switch operation for time periods that require a different timing plan with Day Plan 0 being an empty timing plan used for school holidays and weekends.

16 PROGRAM STEPS — Each day plan (1-9) has 16 program steps. The 16 program steps are used to program ON/OFF times for relay 1 and/or relay 2.

DEFAULT DAY PLAN — The preset day plan that will operate if no other day plans are entered (unless an annual or exception plan is programmed).

DEFAULT WEEK PLAN — A set of day plans that operate each week unless overridden by an exception plan. The default week plan permits the assigning of any day plan to each day of the week. The default week plan (1) operates the AP22 every week of the year. An annual plan program overrides the default week plan program.

ANNUAL PLAN — The AP22 has 36 different annual plans available. Annual plans use an exception-day concept for programming special events such as holidays, early release days, etc., throughout the calendar.

PROGRAMMABLE DAYLIGHT SAVING TIME ADJUSTMENT — The AP22 automatically adjusts for daylight saving time changes according to U.S. law. Re-programmable if law changes.

AUTOMATIC LEAP YEAR COMPENSATION — Perpetual type calendar to adjust for the extra day every 4 years

TRANSFER — Allows program data to be transferred from one AP22 to another.

MANUAL OVERRIDE — Allows one or both relays to be manually activated or deactivated from the keyboard. The manual override will remain in effect until the next programmed step occurs.

PROGRAMMING INTRODUCTION

Programming the ON/OFF functions of the time switch begin with entering a program step time into a day plan(s).

DAY PLAN — A day plan is the programmed ON/OFF steps for a single day. Each day plan has 16 program steps. Day plans are assigned to a day of the week in the week plan.

WEEK PLAN — This programming format gives flexibility for having a completely different timing plan for any day of the week.

ANNUAL PLAN — This feature uses an exception-day format that allows the operator to assign any day plan to run anytime throughout the school calendar. There are 36 annual plan program steps available.

CURSOR — The flashing square character indicating the data entry fields of the AP22. The cursor indicates the data at that position can be entered or changed by using the AP22 keyboard.

ENTER (*) — This key is used to finalize every data entry procedure. Pressing the **ENTER (*)** key will enter the data at that position into the AP22 and move the cursor to the next program field.

PROGRAMMING SEQUENCE

1 CREATE DAY PLANS

- Choose Day Plan Number
- Choose Step Number
- Choose Time
- Choose to Turn Relay 1 or Relay 2 On or Off

2 CREATE WEEK PLANS

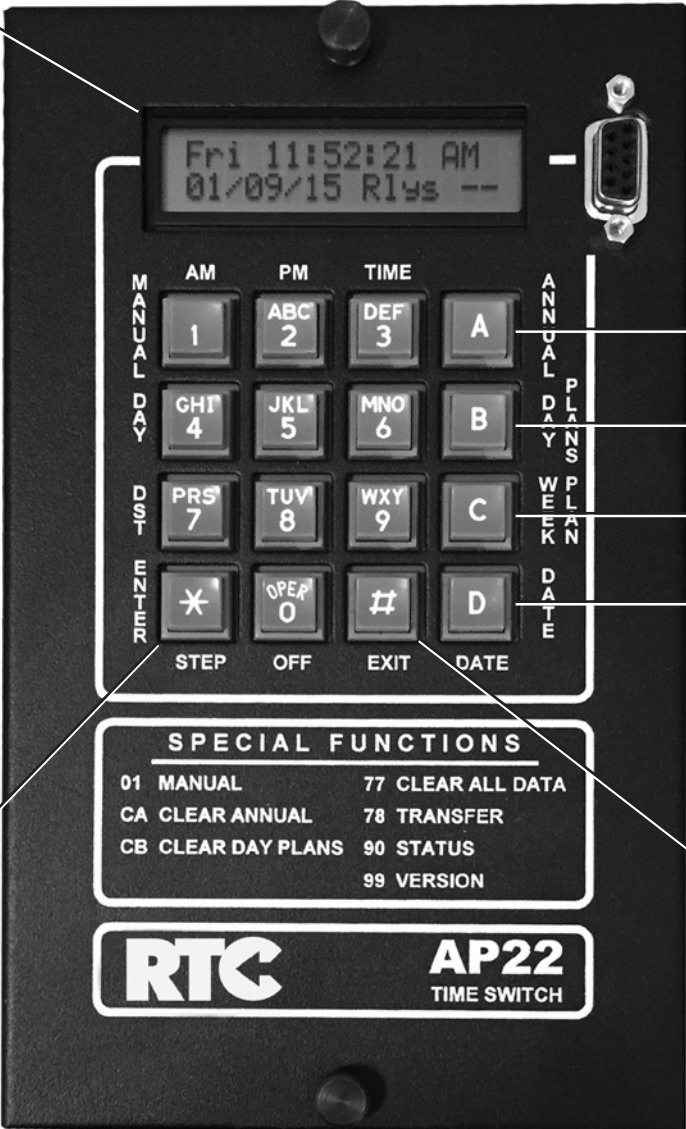
- Choose Day-Of-Week
- Choose Day Plan to Run for that Day-Of-Week

3 CREATE ANNUAL PLANS

- Choose Exception (Annual Plan Number)
- Choose Start Date
- Choose End Date
- Choose Day Plan Number

PRIMARY PROGRAMMING FUNCTION KEYS

MAIN DISPLAY



ANNUAL PLAN

DAY PLAN

WEEK PLAN

DATE

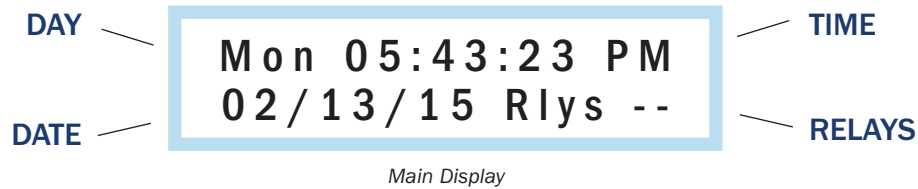
ENTER

EXIT

PROGRAMMING INSTRUCTIONS

Programming must begin from the **MAIN DISPLAY**. The **MAIN DISPLAY** shows the **DAY**, **TIME**, **DATE** and **RELAY** status.

To Return to the **MAIN DISPLAY** at any time, press the **EXIT (#)** key. Press the **ENTER (*)** key to “step” through a field without changing the settings.



PROGRAM THE TIME-OF-DAY

1. From the **MAIN DISPLAY**, press key **3** (**TIME**) then **ENTER (*)**.

Command? 03

Step 1

2. This brings up the **TIME** screen.

The cursor will be on the hour field.

Key in the Hour (i.e.: **03** for 3 o'clock) and then **ENTER (*)**.

Time? 03:28 PM
hh mm 2=PM

Step 2

3. The cursor will move to the minutes field.

Key in the Minute (i.e.: **28** for 28 minutes) then **ENTER (*)**.

Time? 03:28 PM
hh mm 2=PM

Step 3

4. The cursor will move to the AM/PM field.

Key **1** for AM; **2** for PM then **ENTER (*)**.

Make sure a common second is being used so the times are truly synced.

Time? 03:28 PM
hh mm 2=PM

Step 4

PROGRAM THE DATE

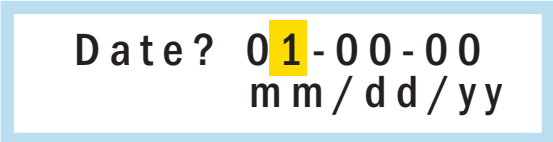
1. From the **MAIN DISPLAY**, press **D (DATE)** then **ENTER (*)**.



Command? 0D

Step 1

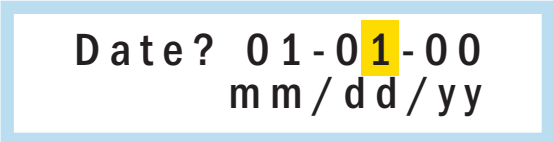
2. Key in the Month (ie: **01** for January) then **ENTER (*)**.



Date? 01-00-00
mm/dd/yy

Step 2

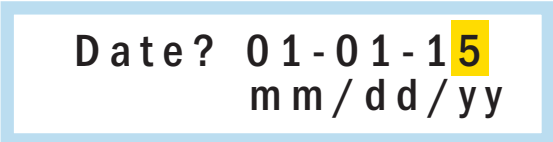
3. Key in the Day (i.e.: **01** for the first day of the month) then **ENTER (*)**.



Date? 01-01-00
mm/dd/yy

Step 3

4. Key in Year (i.e.: **15** for 2015) then **ENTER (*)**.



Date? 01-01-15
mm/dd/yy

Step 4

PROGRAM THE DAY-OF-WEEK

1. From the **MAIN DISPLAY**, press **4 (DAY)** then **ENTER (★)**.

In all versions of AP22 4.04 or earlier this screen allows the day-of-week to be set. In CP22 versions the time switch correctly enters the day-of-week based on the date entered.

2. Press the 4 key to advance the day-of-week, then **ENTER (★)**.

The next screen to appear will be the **MAIN DISPLAY**.

Command? 04

Step 1

Day? Sun

Step 2

PROGRAM DAYLIGHT SAVING TIME (DST)

1. From the **MAIN DISPLAY**, press **7 (DST)** then **ENTER (★)**.

Command? 07

Step 1

2. The AP22 will default to the current U.S. standards:

S (Spring), **M = 03** (March), **SUN = 2** (second Sunday)

F (Spring), **M = 11** (November), **SUN = 1** (first Sunday)

S DST M=03 SUN = 2
DEF M=03 S=2

Step 2

The AP22 will automatically default to these times.

To change the month, simply key in the new month and press **ENTER (★)**.

To change to another Sunday of the month, key in the Sunday of the desired month by entering:

- 1 first Sunday
- 2 second Sunday
- 3 third Sunday
- 4 fourth Sunday
- 5 last Sunday

Then press **ENTER (★)**.

To **disable** DST, enter the Spring month as **0**.

PROGRAM DAY PLANS

DAY PLAN PROGRAM SHEET EXAMPLE

NORMAL DAY PLAN 1				RELAY 1		RELAY 2	
STEP	HOUR	MIN	AM/PM	ON	OFF	ON	OFF
00	07	15	A	X			X
01	08	30	A		X		X
02	02	45	P	X			X
03	04	00	P		X		X
04							

The AP22 has a total of 10 different day plans. Day Plan 1 is the default day plan. It's program should be the ON and OFF schedule for a normal school day. Each day plan has a maximum of 16 program steps from step 00 through step 15. Each step of the day plan is an event time that can be used to turn relay 1 or relay 2 on or off.

Day plans 2 through 9 are programmed for schedules that are different from the normal day plan (i.e.: Day Plan 2 could be programmed as an early release day; Day Plan 3 could be programmed as a summer school day; etc.)

ALWAYS DOUBLE CHECK YOUR DAY PLAN PROGRAMMING.

1. From the **MAIN DISPLAY**, press **B (DAY PLANS)** then **ENTER (*)**.
2. Key in the Day Plan number, or press **B** to advance through the Plan numbers, then **ENTER (*)**.
3. Key in the Step number, or press the **B** key to advance through the Step numbers, then **ENTER (*)**.
4. Key in the Hour for this Step, then **ENTER (*)**.

Plan:1 Step:00
07:15A Relays:1-

Depicts the programming of **PLAN 1, STEP 00** to turn **RELAY 1 "ON"** at 7:15 AM.

Plan:1 Step:01
08:30A Relays:--

Depicts the programming of **PLAN 1, STEP 01** to turn **RELAY 1 "OFF"** at 8:30 AM.

Command? 0B

Step 1

Plan:1 Step:00
00:00A Relays:--

Step 2

Plan:1 Step:00
00:00A Relays:--

Step 3

Plan:1 Step:00
07:00A Relays:--

Step 4

5. Key in the Minute for this Step, then **ENTER** (*).

```
Plan:1 Step:00
07:15A Relays:--
```

Step 5

6. Press **1** for AM or **2** for PM, then **ENTER** (*).

```
Plan: 1 Step:00
07:15A Relays:--
```

Step 6

7. Press **1** to turn Relay 1 on or off, then **ENTER** (*); Press **2** to turn Relay 2 on or off, then **ENTER** (*).

```
Plan: 1 Step:00
07:15A Relays:1-
```

Step 7

The screen will automatically advance to the next Step. When all of the Steps have been programmed, Press **EXIT** (#) to advance to the next day plan number. When all day plans have been programmed, press **EXIT** (#) to return to the **MAIN DISPLAY**.

CLEAR THE PROGRAM IN A DAY PLAN

1. To clear the program in a day plan press **C**, then **B**, then **ENTER** (*).

```
Command? CB
```

Step 1

2. Key in the Day Plan number to be cleared, then **ENTER** (*).
This example shows the program for day plan 3 will be cleared.

```
Clear Plan? 1
Plan 1 - 9
```

Step 2

3. Press **1** to clear the day plan.
Press **EXIT** (#) to avoid clearing the day plan, and keep it as is.
Both entries will return you to the **MAIN DISPLAY**.

```
1=Clear Plan 1
```

Step 3

To clear additional day plans, repeat the above procedure for the correct day plan number.

PROGRAM THE DEFAULT WEEK PLAN

WEEK PLAN PROGRAM SHEET EXAMPLE

DEFAULT WEEK PLAN

	A	B
SUN	0	
MON	1	
TUE	1	
WED	1	
THU	1	2
FRI	1	
SAT	0	

A = Factory selected Day Plans for Default Week Plan

0 = No School Day Plan

1 = Normal Day Plan

B = User selected Day Plans for the Default Week Plan

The default week plan is the school schedule the AP22 runs every week.

After programming all the day plans, assign any day plan to any day of the week to accommodate the normal weekly school schedule.

The default programming for the default week plan is shown above. Day plan 1 is automatically assigned to operate Monday through Friday. No other programming is necessary if the schedule is the same for Monday through Friday.

However, if a school has an early release day every Thursday, the Day Plan for the early release day can be scheduled to run every Thursday. The example above shows Day Plan 2 being programmed to run every Thursday. If Day Plan 2 is programmed as an early release, the AP22 will run this schedule every Thursday.

1. From the **MAIN DISPLAY** press **WEEK PLAN (C)** then **ENTER (*)**.

Command? 0C

Step 1

2. Press **C** to advance to the weekday to be programmed, then **ENTER (*)**.

Thu = Plan 1
0 = Holiday 1 = Nrm 1

Step 2

3. Press **2** to program day plan 2 to run every Thursday, then **ENTER (*)**.

Thu = Plan 2
0 = Holiday 1 = Nrm 1

Step 3

The screen will automatically advance to the next day. When all of the day plans have been programmed, press **EXIT (#)** to return to the **MAIN DISPLAY**.

PROGRAM ANNUAL PLANS

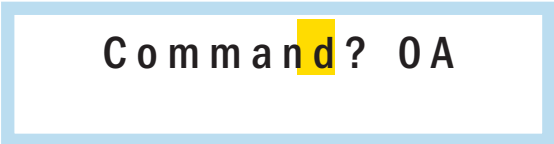
The AP22 has a total of 36 different annual plans. The annual plan feature uses an exception-day concept for programming school holidays, spring break, early releases, the start and end of summer vacation and summer school, etc. The system works by entering the month, day, and year the annual plan will start, and the month, day and year the annual plan will end. If it is a one day exception, only the start date needs to be entered (for example, Steps 00, 01, and 03 shown below).

The sample chart to the right indicates the following exception days in the annual plan:

- Step 00 = School holiday for February 16, 2015
- Step 01 = Early release day for March 10, 2015
- Step 02 = Spring Break from March 9 through March 13, 2015
- Step 03 = Early release for May 8, 2015
- Step 04 = Start of Summer vacation on June 12, 2015
End of Summer Vacation on August 14, 2014

STEP	START			END			DAY PLAN
	MONTH	DAY	YEAR	MONTH	DAY	YEAR	
00	02	16	15	02	16	15	0
01	03	10	15	03	10	15	2
02	03	09	15	03	13	15	0
03	05	08	15	05	08	15	2
04	06	12	15	8	14	15	0
05							
35							

1. From the Main Display press **A (ANNUAL)**, the **ENTER (*)**.



Step 1

2. Key in the Exception (Annual Plan Number), then **ENTER (*)**.



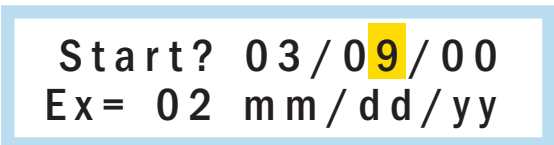
Step 2

3. Key in the Start Month (ie: **03** for March), then **ENTER (*)**.



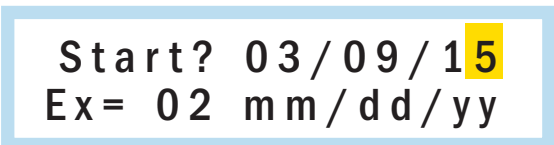
Step 3

4. Key in the Start Day, then **ENTER (*)**.



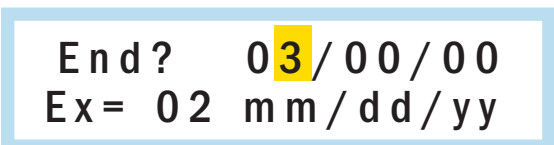
Step 4

5. Key in the Start Year, then **ENTER (*)**.



Step 5

6. Key in the End Month, then **ENTER (*)**.
If this is a one day exception, press enter without entering a number.



Step 6

7. Key in the End Day, then **ENTER** (*).

```
End? 03/13/00
Ex= 02 mm/dd/yy
```

Step 7

8. Key in the End Year, then **ENTER** (*).

```
End? 03/13/15
Ex= 02 mm/dd/yy
```

Step 8

9. Key in the Day Plan Number that will run during the dates programmed above. Remember that Day Plan 0 is the plan for when there is no school.

```
Plan? 0
```

Step 9

10. The screen will automatically advance to the next annual plan number, when all of the annual plans have been programmed, press **EXIT** (#) to return to the **MAIN DISPLAY**.

```
Exception? 03
```

Step 10

CLEAR ALL ANNUAL PLANS

1. To Clear the program in all of the annual plans press **C**, then **A**, then **ENTER** (*).

```
Command? CA
```

Step 1

2. Press **1** to clear all annual plans. Press **EXIT** (#) to avoid clearing the annual plans. Both entries will return you to the **MAIN DISPLAY**.

```
1 = Clear All
Annual Plans.
```

Step 2

TRANSFER A PROGRAM

1. To transfer the program from one AP22 to another, press **78**, then press **ENTER** (*) on the time switch the program will be transferred from. An RTC time-switch-to-time-switch transfer cable (not included) is required for the transfer.

Attach Cable,
Then Press *

Step 1

2. Connect the transfer cable to the two time switches and press **ENTER** (*) on the time switch the program will be transferred from. The receiving AP22 will display this screen.

Receiving... 357
Please Wait.

Step 2

The program will be downloaded from one time switch to the other.

HOW TO USE MANUAL CONTROL

1. To operate the relays of the AP22 manually, press **1**, then **ENTER** (*).

Press **1** to turn RELAY 1 on or off,

Press **2** to turn RELAY 2 on or off,

Press **ENTER** (*) to initiate the manual control feature.

2. The **MAIN DISPLAY** will change as follows to indicate the relay(s) are in a manual control state. The relays will remain in this state until the next program step of the day plan begins or until it is manually turned off.

Relays:--
1 -Rly1, 2 -Rly2

Step 2

Mon 05:43:23 PM
02/13/15 Rlys 1-

Step 2

WIRING HARNESS COLOR CHARTS

AP22 STANDARD WIRING

PIN #	WIRE COLOR	FUNCTION
1	BLACK/WHITE	120 VAC
2	WHITE	AC-(NEUTRAL)
3	GREEN	CHASSIS GROUND
4	YELLOW/BLACK	RELAY 1 COMMON
5	YELLOW	RELAY 1 N/C
6	BLUE/BLACK	RELAY 2 COMMON
7	BLUE/WHITE	RELAY 2 N/O
8	ORANGE	NO USE
9		
10	WHITE/YELLOW	RELAY 1 N/O
11		
12		
13	BLACK/RED	DC-
14	WHITE/ORANGE	NO USE
15	RED	DC+
16	BLUE	RELAY 2 N/C

TXDOT WIRING

PIN #	WIRE COLOR	FUNCTION
1	BLACK	120 VAC
2	WHITE	AC-(NEUTRAL)
3	GREEN	CHASSIS GROUND
4	RED	RELAY 1 N/O
5	YELLOW	RELAY 1 N/C
6	BLUE/BLACK	RELAY 2 COMMON
7	BLUE/WHITE	RELAY 2 N/O
8	ORANGE	RECEIVE (N/U)
9	N/U	N/U
10	WHITE/YELLOW	RELAY 1 COMMON
11	WHITE/RED	DC+
12	WHITE/BLACK	DC-
13	N/U	N/U
14	WHITE/ORANGE	TRANSMIT (N/U)
15	N/U	N/U
16	BLUE	RELAY 2 N/C



PROGRAMMING RECORDS

DAY PLAN RECORD

NORMAL DAY PLAN 1				RELAY 1		RELAY 2	
STEP	HOUR	MIN	AM/PM	ON	OFF	ON	OFF
00							
01							
02							
03							
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							

DEFAULT WEEK PLAN

	A	B
SUN	0	
MON	1	
TUE	1	
WED	1	
THU	1	
FRI	1	
SAT	0	

A = Factory selected
Day Plans for
Default Week Plan

0 = No school Day Plan
1 = Normal Day Plan

B = User selected
Day Plans for the
Default Week Plan

NOTES:

ANNUAL PLAN RECORD

STEP	START			END			DAY PLAN
	MONTH	DAY	YEAR	MONTH	DAY	YEAR	
00							
01							
02							
03							
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

AP22**COMMON SCREEN COMMANDS**

This document last edited October 2014 for version 2.8. Some commands may not be available in previous versions of firmware. Visit RTC-Traffic.com for the latest version of AP22 firmware.

INSTRUCTIONS

To start any of the command screens below, type the screen number on the keypad from the **MAIN DISPLAY** and press **ENTER (*)**. At any point, return to the **MAIN DISPLAY** by pressing **EXIT (#)**.

SCREEN 01 — MANUAL CONTROL

This screen turns a relay on or off manually. The relay will stay in the programmed state until a different calendar event is processed.

```
Relays: --
1 -Rly1, 2 -Rly2
```

SCREEN 03 — SET TIME

This screen allows the hour and minute to be set. By pressing **ENTER (*)**, the seconds field is set to 0.

```
Time? 09:28 AM
hh mm 2=PM
```

SCREEN 04 — DAY OF WEEK

In all versions of AP22 4.04 or earlier, this screen allows the day-of-week to be set. In CP22 versions, the time switch correctly enters the day-of-week based on the date entered (see Screen OD on page 25).

```
Day Of Week Set
Automatically
```

SCREEN 07 — DAYLIGHT SAVING TIME SETUP

This screen allows daylight saving time to run in the time switch. Enter the month and the weekend the time switch should enter or exit DST. The AP22 will default to these current U.S. standards:

```
S DST M=03 SUN=2
DEF M=03 S=2
```

S (Spring), M = 03 (March), SUN = 2 (second Sunday)

F (Spring), M = 11 (November), SUN = 1 (first Sunday)

To disable DST enter the Spring month as 0.

SCREEN 0A — ANNUAL PLAN PROGRAMMING

This screen is used for entering annual plans. These plans select a date range, then a day plan that will run within the date range. There are 36 annual plans from plan 0 to plan 35. Select day plan 0 to have no relays activated.

The time switch will not run properly if annual plans overlap. The time switch runs the day plan of the first valid annual plan it finds for the day. If there are other annual plans that are in the same range they will not be used.

Exception? 00

SCREEN 0B — DAY PLAN SETUP

This screen is used for setting up a day plan. The day plan number can run from 1–9. Each day plan consists of 16 steps. The steps are the times the relays change to the programmed state.

Plan: 1 Step: 00
07:15A Relays: 1-

SCREEN 0C — DEFAULT PLAN SETUP

This screen selects which day plan will run on any given day of week. Typically Sat and Sun are set to 0 and Mon–Fri are set to 1. However, if day plan 2 needs to run on Wednesday then select that day in the menu and program the day plan to 2.

Thu = Plan 1
0 = Holiday 1 = Nrm 1

SCREEN 0D — DATE SETUP

This screen sets the date for the time switch.

Date? 01-01-15
mm/dd/yy

SCREEN 22 — TIME SWITCH ADDRESS

This screen programs the address of the time switch. If the time switch is not in a Radio or WiFi network then leave this set to:
Mgrp = 0 Grp = 0 Loc = 0

For radio or WiFi networks, this number must be unique in the network.

MASTER GROUP (Mgrp)

- Typically set to 01
- A Master Group can contain up to 99 GROUPS (GRP)

GROUP (Grp)

- A Group can contain up to 99 time switches
- Each time switch within a group is given a LOCATION NUMBER (Loc)

LOCATION NUMBER (Loc)

- A Location Number uniquely defines a time switch within a group.
- This number should be from 1-99
- Typically all time switches in a school are in the same group.

Mgrp 01 Grp 01
Loc 01

Mgrp 01 Grp 02
Loc 03

For example, the address for the 3rd time switch in the second group of schools would be: **Mgrp = 1 GRP = 2 Loc = 3**

Once more than 99 groups are in **Mgrp = 1**, then **Mgrp = 2** can begin being used.

SCREEN 30 — GPS STATUS

The AP22 requires the latest processor and an external GPS antenna from RTC.

This screen displays the status of the optional GPS device attached to the connector on the AP22. This device will set the time in the AP22 when it varies more than 10 seconds away from the GPS satellite constellation.

The screen will report 'Not Receiving' when there is no GPS receiver attached.

When the receiver is attached it will show a counter for each data packet received from the GPS receiver. The screen will show 'Receiving 14'. This will increment about once per second with each transmission from the GPS receiver. It typically takes less than 30 seconds to identify the GPS receiver when it has been recently powered up, however it may take up to five minutes.

Once the time is read from the GPS receiver, the display will show 'GPS Locked' and display the current time and date.

If the time is incorrect, it is likely the Time Zone parameter is setup incorrectly. See Screen 31 to set the correct Time Zone.

**GPS Acquiring SAT
Not Receiving...**

**GPS Acquiring SAT
Receiving 14...**

SCREEN 31 — TIME ZONE

Use this screen to enter the number of hours away the time switch is from Coordinated Universal Time (UTC). The standard US time zones are shown below.

EST - 5
CST - 6
MST - 7
PST - 8

Enter this number whether it is currently DST or not as this is the offset from UTC without regard to daylight saving time. If this is a stand alone system with GPS, this parameter must be set correctly to your time zone.

**Time Zone = -06
-5 = EST .. -8 = PST**

SCREEN 32 — DAYLIGHT SAVING TIME DEBUG

This screen displays the date DST starts, the date DST ends and whether or not the time switch thinks daylight saving time is active.

**DST Enabled
Outside of DST**

SCREEN 35 — START TIME

This screen displays the date and time when the time switch was powered up as well as the last time the AP22 received a download.

**START 01/15/15
TIME 10:12:22 PM**

Does not show keyboard entry data.

**DOWNLOAD 01/12/15
TIME 03:39:45 PM**

SCREEN 37 — M2M TIME

When an AP22 has an M2M modem attached, the cellular network tower time may be displayed. The Screen 37 command queries the modem for its tower time. If the modem is connected to the tower then the AP22 will be set to the modem time.

**Hit * To Read
Modem Time**

The best way to test this command is to set the AP22 to an incorrect time. For example, set the time to 12:00 AM using Command 03. Then enter Command 37 and the AP22 time will sync to the tower time. If the AP22 time does not sync, then the modem is not connected to the network. If the time is correct to the minute, but the hour is off then it is likely the AP22 is set to the wrong time zone. The time zone can be adjusted using Command 31 (see page 26).

SCREEN 38 — MODEM POWER

When an AP22 has a modem attached, this command displays the modem cell power. This number is in dB and ranges from -101 through -40 with -40 being stronger than -101.

**Modem Power
Initializing...**

This command is useful when moving antennas around to find the best signal strength.

SCREEN 40 — SUNRISE AND SUNSET TIME

When latitude and longitude have been programmed into an AP22, the switch will calculate the sunrise and sunset time for its position on the map. Longitude and latitude are entered using Command 41 (manual) or Command 42 (GPS). GPS coordinates are indicated in decimal degrees as compared to degrees, minutes, seconds.

The formula for converting degrees, minutes, seconds to decimal degrees is:

$$\text{Degrees} + (\text{Minutes}/60) + (\text{Seconds}/3600)$$

Many cell phones present location in degrees, minutes, seconds and there are many conversion utilities available online.

SUNRISE 07:12 AM
SUNSET 05:23 PM

SCREEN 41 — LATITUDE AND LONGITUDE

This screen edits the latitude and longitude of the AP22. The coordinates used are in decimal degrees as compared to degrees, minutes, seconds. Refer to Screen 40 for information on converting degrees, minutes, seconds into decimal degrees.

The latitude is displayed in degrees North. The longitude is displayed in degrees West.

This information is used to calculate sunrise and sunset times. Relay times can be programmed to turn on and off relative to both sunrise and sunset. In order for these commands to work, the latitude, longitude and time zone must be correct.

LAT = 32.6245
LON = 097.1293

SCREEN 42 — READ GPS COORDINATES

From this screen, the latitude, longitude and time may be read provided there is an external GPS antenna installed. This command is best tested by setting the latitude to a random number, such as 10, using Command 41. Then use Command 42 and see if the GPS coordinate changes to the position of the time switch. This command also sets the time in the AP22 according to a cell tower or the GPS receiver.

Press 1 to Read
LAT = 32.6245

SCREEN 77 — DATA CLEAR

Command 77 allows all programming from time switch to be cleared. On CP22 models the time and date of the clock is not changed, but all other steps, plans, annual plans and default plans are erased. On earlier models the time switch will revert to factory settings.

1 = Clear All Data
= Go Back

SCREEN 78 — DATA TRANSFER

Command 78 allows programming from one AP22 to be transferred to another AP22. This function requires an AP22 transfer cable (not included). Simply connect the two AP22s with the RTC cable. The transfer will start when you press **ENTER** (*).

**Attach Cable,
Then Press ***

SCREEN 79 — RESET AP22

Command 79 tells the AP22 to restart. It is useful when reaching the power supply is difficult and changes that are retained through a power cycle need to be confirmed.

**1 = Reset AP22
= Go Back**

SCREEN 90 — STATUS

This screen displays the day plan currently running and which annual plan is active. If 'Exception XX' is displayed, then no annual plans are active.

**Day Plan: 1
Exception: xx**

SCREEN 99 — VERSION

This screen shows the software version the time switch is currently running.

**CP22 Ver2.80
Build 3 2400bd**

SCREEN CA — CLEAR ANNUAL

This screen clears all annual plan programming, leaving programmed day plans and default plans unchanged.

**1 = Clear All
Annual Plans.**

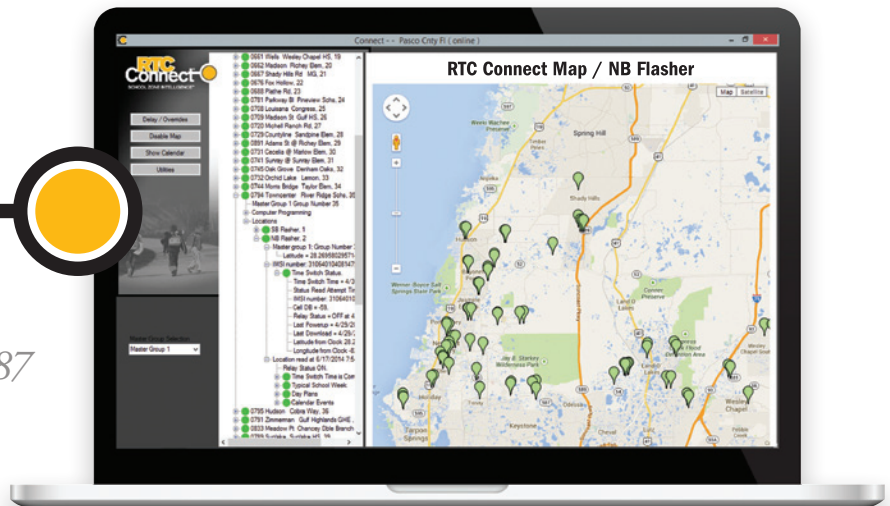
SCREEN CB — CLEAR DAY PLANS

This screen clears all day plan programming, leaving the programmed annual plans unchanged.

**Clear Plan? 1
Plan 1 - 9**

Converting AP22 software to RTC Connect™ software

1. Go to RTC-Traffic.com
2. Click 'Software/Help'
3. Under 'Legacy Software Downloads', click AP22 Software v2.30
4. Install at prompt
5. Open the AP22 software
6. Go to 'Utilities'
7. Click 'Setup'
8. Click 'Export to CSV files'; answer 'Yes' at the prompt
9. Close AP22 software
10. Open RTC Connect™
11. Go to 'Utilities'
12. Click 'Convert Version 9 CSV files'



RTC Connect™ software utilizes a Graphical User Interface (GUI) for both the school calendar and mapping of flasher locations to make designing and maintaining your flasher network quick and easy — just what you would expect from the industry leaders at RTC.





RTC Manufacturing Inc. (RTC) warrants its products to be free from defects in materials and workmanship for a period of five (5) years from the date of purchase provided:

- **the product was property installed, used, operated and maintained; and**
- **the customer has proof of the date of purchase**

RTC will, at its option, either repair or replace the defective product.

The customer at its cost shall deliver the defective product to RTC, and RTC will repair or replace the product and return it to the customer at RTC's cost.

RTC will not be responsible for damage caused by electrical surges, brownouts, blackouts, lightning or any other act of God or electrical event.

PRODUCT EXCEPTIONS:

— Cellular Modem equipment carries the same warranty above, except the term is for a period of one (1) year.

— Radio Equipment carries the same warranty above, except the term is for a period of one (1) year.

— Batteries carry the same warranty above, except the term is for a period of two (2) years.