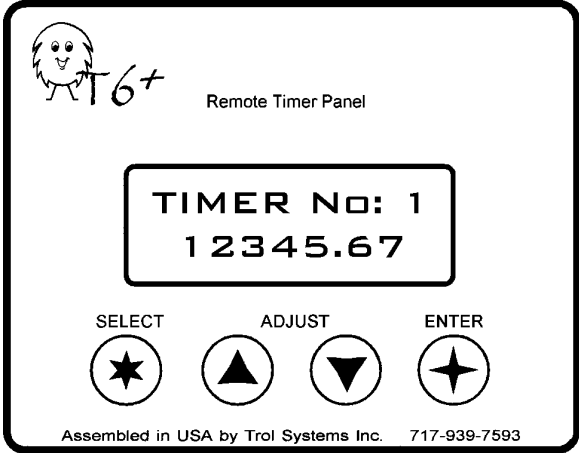


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Remote Timer Panel

Air-Oil Systems, Inc. www.airoil.com

Operating Manual
for part number:
RTP-02



Specifications

Part No:

RTP-02, w/ software version 1.06

Physical:

3.2" (81.5mm) wide, 2.55" (65mm) high, 1.25" (32mm) deep polycarbonate overlay over .058" thick aluminum face plate
.06" thick neoprene gasket seals to NEMA type 12 protection
supplied data cable is 30" (763mm) long

Display:

2 line x 12 character super twist LCD, 40 degree viewing angle
character size is .25" (6.20mm) high, by .13" (3.2mm) wide
operating temperature range 0 to 50 deg. C. (32 to 120 deg. F.)
storage temperature range -20 to 70 deg. C. (-4 to 158 deg. F.)

Power Requirements

power is supplied by the T6+ MCU via data cable, 5 volts maximum

Performance:

each timer can be operated by any page, any number of times
timing range is .01 to 49,999.90 seconds in 10ms resolution
timing accuracy is + 3ms repeatability
15 individual messages, containing 24 characters each
timer settings and messages are stored internally via nonvolatile eeprom which does not require battery backup.

OEM considerations:

Custom cable lengths for the RTP are available. Panel units can be setup on a personal computer, using the Computer Interface Module with a power pack (part nos. CIM-03 & 30101). Writing messages on a keyboard is quick and easy. Additional panel units can then be cloned, eliminating the need to setup each panel individually.

For additional information and tips on using the RTP and other T6 equipment, check our web site at www.trolsystems.com. Customer FAQs and feedback will be posted as it becomes available. We welcome any comments that you'd like to send us.

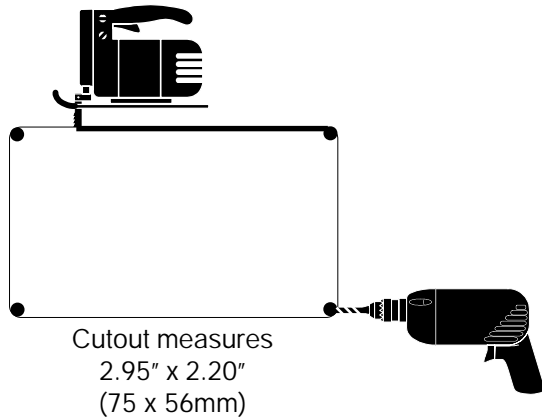
Features

Some machine applications require the operator to make frequent adjustments to time settings. The Remote Timer Panel (RTP) allows easy adjustments to eight timers while the machine is running. Here are some key features of the RTP:

- **Adjustment Window:** Each timer can be limited to a selected range of adjustment. You determine how wide this adjustment window should be. The timer will use the new adjustment on its next timing cycle.
- **Save Adjustment Mode:** You choose whether adjustments to the timer are saved or not. If it's not saved, the timer would be restored to the initial programmed setting when the system is powered up.
- **Display Mode:** Each timer can either be shown as running (indicating the time remaining) or fixed (showing the set time).
- **Timer Names:** You can assign a name to any timer (up to 12 characters long). For example; Timer 3 could be named "FILLING TANK" with the time shown on the bottom line.
- **Messages:** Up to 15 individual messages can be shown on the panel. Each message is 24 characters long and can be made up of letters, numbers and symbols.
- **Send & Receive Data:** Once setup for operation of timers and messages, additional remote timer panels can be "cloned". This eliminates needing to manually setup each panel. A program transfer module, part number PTM-02 or Computer Interface Module CIM-03, is required.

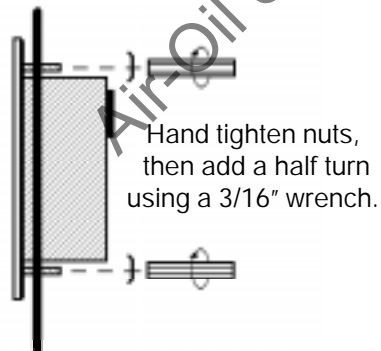
Installation

The display will require cutting out a rectangular section of the panel with a reciprocating saw or nibbling tool. Use the peel & stick template (included) as a guide to locate the panel. Use a center punch to prevent the drill bit from "walking". Drill the four holes using a 1/4" bit. Use a sheet metal blade (18 to 36 tpi) to cut between the outer side of the holes.



After the panel is drilled and cut, remove all burrs and file down rough edges. Check to make sure that the panel is still flat. Mounting the display on a distorted panel may cause improper operation of the adjustment keys. Install the panel display into the cutout.

Using the supplied nuts and special washers, tighten the nuts until they pull the display snugly against the panel. Be careful not to overtighten the nuts. Use of thread-lock liquid is recommended where the panel is subjected to a high vibration.



Note: The washers should be oriented so that one edge reaches out to grip the panel while the other edge is against the gasket of the RTP. This will cause the washer to look uneven when properly installed.

Adjusting Timers

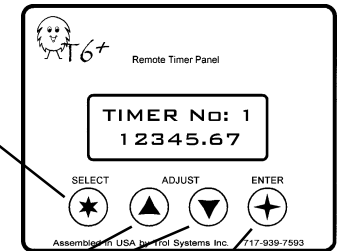
The timer panel allows you to adjust timers while the machine is running, without interfering with the operation of the MCU. Only timers that were setup for operation using the Setup menu can be accessed. If you adjust a timer that is currently running, the adjusted setting will be used for the next timing cycle.

Here's how the keys operate when the machine is running:

SELECT which of the eight timers that you want to adjust or view. The panel will enter the Adjust mode while the MCU continues running. Only timers that are setup for operation are displayed*.

ADJUST the time setting higher or lower. The timer adjustment will scroll faster as the adjust key is pressed and stop when a High or Low limit of the timer is reached. A short time after releasing the Adjust key, the new time adjustment is saved (if allowed by setup) and the panel will return to the run mode.

ENTER accepts the displayed selection while in the Setup menu.

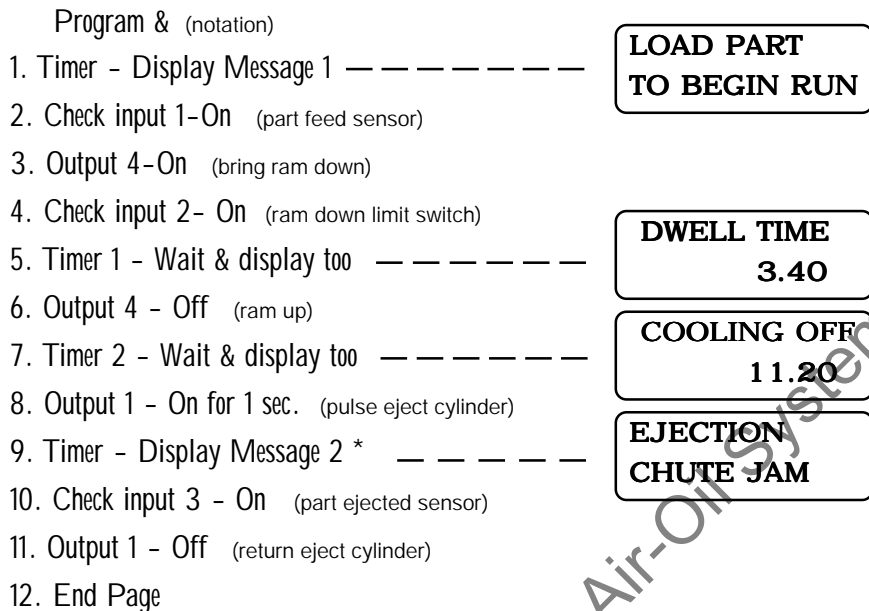


* Once a timer is setup, it will be one of those that is displayed when the Select key is pressed. If you no longer want a timer to be displayed, go to the Setup Options menu and choose to remove it.

Operation

All timer parameters, (such as its setting, limits of adjustment, name) reside in the memory of the panel unit. When a "Timer" function is executed by the MCU, it controls when a timer is started or checked. It also controls what is displayed on the panel. Any page of the MCU can contain the Timer function and there is no limit how many times it's programmed.

Here's an example of how the program of a hot stamping machine would work with the panel.

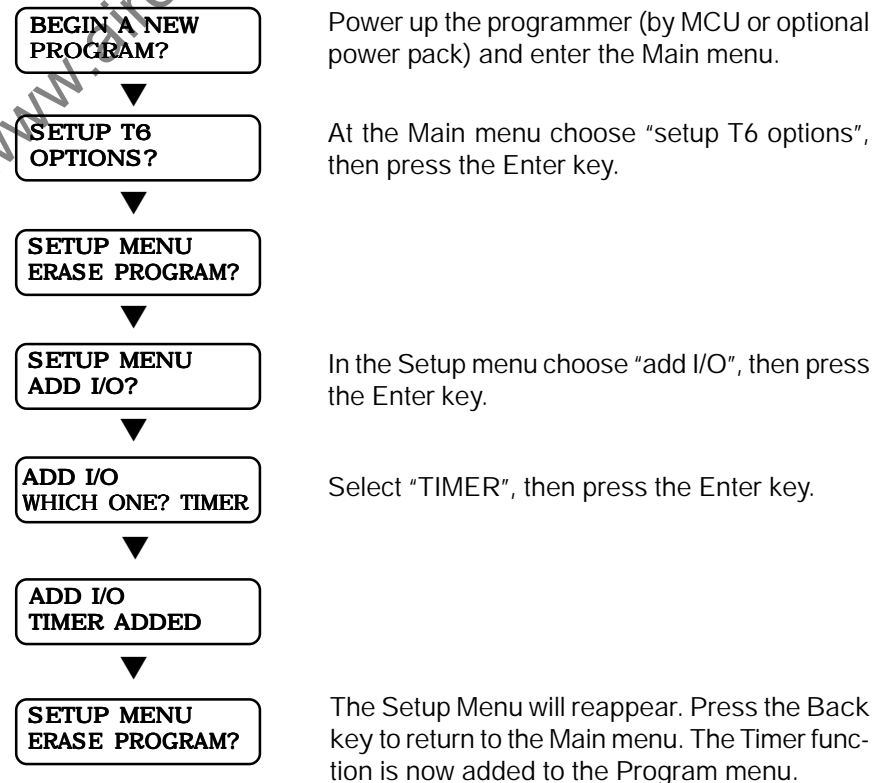


* This "Jam" message would only be seen by the operator if input #3 (part ejected sensor) is not on. Otherwise; lines 10, 11, 12 and 1 are executed so fast, that only the message of line 1 would be able to be seen. Keep this in mind when you program more than one message to be displayed. Be sure to allow sufficient time between each message.

Installation

Plug one end of the data cable into the panel display, and the other end into one* of the data ports of the MCU. For optimum performance, avoid placing the data cable near (especially parallel to) any wiring that carries power. Plug the pocket programmer into the other data port of the MCU. The pocket programmer must be set up to include new timing functions in the program menu by following the instructions below.

Note: If using a Computer Interface Module (CIM-03), the following setup procedure can be done using the T6 program (version 2.20 or higher).



* Note: If there is only one data port on the MCU, it is a standard T6. You must have a T6+ MCU and programmer in order to use this panel display. Please contact your distributor.

Setup Menu

The RTP must be set up to operate the timers and messages that will be controlled by the MCU. To access the Setup Menu, the RTP must be connected to the data port of the MCU. Plug the pocket programmer into the other data port of the MCU (or the open port of the last I/O section in the system). Apply power to the MCU. The MCU will detect the programmer and will not automatically begin the Run mode.

**x timers
are setup**

Press the "Select" and "Enter" keys of the RTP at the same time to enter the Setup menu. The Setup menu choices are listed below.

**setup menu
timer: 1 - 8**

See the next page for instructions on setting up the timers.

**setup menu
messages**

See "Setup Messages" page for instructions on how to set up a message for display.

**setup menu
options**

Choose "Options" to remove a timer from setup so that it can no longer be selected by the machine operator. The Options menu also contains choices to send and receive data. Please refer to the instructions supplied with the optional Program Transfer Module.

**setup menu
exit**

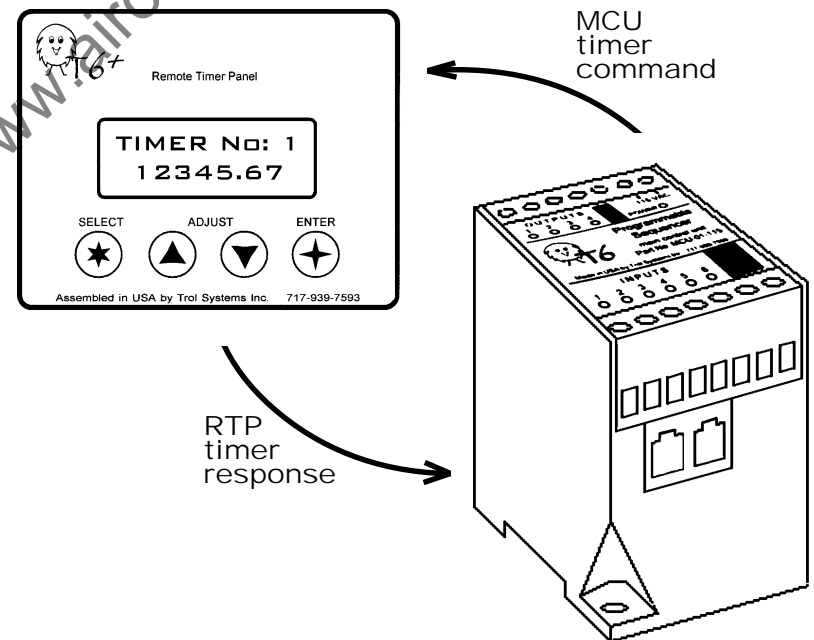
Select "Exit" to leave the Setup menu and return the panel to normal operation.

Note: After the Pocket Programmer has been disconnected from the data port of the MCU, the Setup menu cannot be accessed by the machine operator. Therefore, you should keep the programmer in a secure place to prohibit tinkering with the settings of the RTP or the MCU's program.

Operation

When the MCU executes a Timer function, it sends a command for the RTP to do one of the following:

- display a timer
- display a message
- start, freeze or thaw a timer
- request the status of a timer- has it finished (off), or is it still running (on)?



The Panel display responds to the MCU's command by:

- displaying the information requested
- informing the MCU that the wait time cycle has ended
- starting, freezing or thawing the timer as instructed
- sending the status of the timer as the MCU had requested

Messages

Message No: T10

— — — — — — — — — — — — — — — —
— — — — — — — — — — — — — — — —

Message No: T11

— — — — — — — — — — — — — — — —
— — — — — — — — — — — — — — — —

Message No: T12

— — — — — — — — — — — — — — — —
— — — — — — — — — — — — — — — —

Message No: T13

— — — — — — — — — — — — — — — —
— — — — — — — — — — — — — — — —

Message No: T14

— — — — — — — — — — — — — — — —
— — — — — — — — — — — — — — — —

Message No: T15

— — — — — — — — — — — — — — — —
— — — — — — — — — — — — — — — —

Setup Timers

The RTP must be setup to operate the timers that will be controlled by the MCU. Use a pencil to write down the settings of each timer on the next two pages. This information is helpful for programming the MCU.

Start by accessing the Setup Menu of the RTP, then follow these steps:

Step 1: Using the Adjust keys, select one of the eight timers that you'd like to setup, then press the Enter key.

Step 2: Set the TIME (in seconds) for this timer. This is the setting that is adjusted by the machine operator. The Select key moves the cursor to the left. The Enter key moves the cursor to the right until "OK" appears. If Enter is pressed then, the time setting is stored.

Step 3: Set the HIGH limit of adjustment for this timer.

Step 4: Set the LOW limit of adjustment for this timer.

Step 5: Choose how the timer should be displayed. Your choices are: SET TIME (the time setting is shown fixed) or TIME LEFT (the time is shown running toward zero).

Step 6: Choose whether adjustments to the timer should be remembered or not. If not, the timer goes back to the original setting (of step #2) when the MCU is powered up.

Step 7: Choose whether you want to NAME the timer. (The name is what is displayed to the machine operator on the panel, it will still be referred to by number in the programmer.) If you select NO, the timer's name remains unchanged. If you choose YES, a cursor will appear under the top left character of the timer's name. Use the Adjust keys to select a character to be placed in this space. Press the Enter key to move on to the next space (Select key to backspace). When the last (12th) character is selected, the timer has been renamed.

After step 7, the Setup Menu will return to Step 1. If your finished setting up the timers, choose EXIT to return the RTP to normal operation.

Timer Settings

Timer 1 is used for: _____

set time: _____ high limit: _____ low limit: _____

display as: time left (running) set time (fixed)
save adjustments? yes no name timer? no yes

name: _____

Timer 2 is used for: _____

set time: _____ high limit: _____ low limit: _____

display as: time left (running) set time (fixed)
save adjustments? yes no name timer? no yes

name: _____

Timer 3 is used for: _____

set time: _____ high limit: _____ low limit: _____

display as: time left (running) set time (fixed)
save adjustments? yes no name timer? no yes

name: _____

Timer 4 is used for: _____

set time: _____ high limit: _____ low limit: _____

display as: time left (running) set time (fixed)
save adjustments? yes no name timer? no yes

name: _____

Messages

Message No: T4

Message No: T5

Message No: T6

Message No: T7

Message No: T8

Message No: T9

Setup Messages

In addition to displaying timers, you can also display up to 15 different messages. Each message contains two lines of 12 characters. The choice of characters includes uppercase, lowercase, numbers, spaces and symbols.

To program messages, access the setup menu. Select "messages", then choose the message number that you'd like to program. The cursor will begin at the upper left hand corner. Use the Adjust keys to select the character, then press the Enter to move to the next space (Select key to backspace). When the last character is entered, the message is finished. Since there are two types of panels- messages for the Timer panel are designated with a "T" and messages for the Counter panel are designated "C".

Tip: Use a pencil to write down your messages on the following templates first. This will help you to plan how it should look. Then check off the box above the message after you finish programming it.

Message No: T1

Message No: T2

Message No: T3

Timer Settings

Timer 5 is used for: _____

set time: _____ high limit: _____ low limit: _____

display as: time left (running) set time (fixed)

save adjustments? yes no name timer? no yes

name: _____

Timer 6 is used for: _____

set time: _____ high limit: _____ low limit: _____

display as: time left (running) set time (fixed)

save adjustments? yes no name timer? no yes

name: _____

Timer 7 is used for: _____

set time: _____ high limit: _____ low limit: _____

display as: time left (running) set time (fixed)

save adjustments? yes no name timer? no yes

name: _____

Timer 8 is used for: _____

set time: _____ high limit: _____ low limit: _____

display as: time left (running) set time (fixed)

save adjustments? yes no name timer? no yes

name: _____

Timer Function

Once the pocket programmer was setup for the RTP, a new "TIMER" function will appear in the program menu. You may choose to control one of the eight times or display a message (see next page). After choosing a timer, you'll need to select what the MCU should do with the timer:

Wait for it - The selected timer will start at its current setting and run down until it reaches zero. The MCU will then execute the next line of the page. This is the most popular timer function and can be used in place of the Wait function. See additional option*.

Display it - The selected timer is displayed on the panel instead of whatever previously may have been displayed.

Check if off - The selected timer is checked to see if it is off (time cycle finished). If it is, the page will go onto the next line. If it isn't, you can choose to move the page to another line.

Check if on - The selected timer is checked to see if it is on (still running). If it is, the page will go onto the next line. If it isn't, you can choose to move the page to another line.

Freeze it - The selected timer is frozen and cannot operate until thawed.

Thaw it - The selected timer will resume operation from where it was before being frozen.

Start it - The selected timer will start at its current setting and begin running down. However, the MCU not wait for the time cycle to finish. It will immediately execute the next line of the page. The timer must then be checked later in the program or another page. See additional option*.

* After selecting the Start or Wait functions, an additional prompt to display the timer will appear. This gives you flexibility to determine what you want displayed at any line of your program.

Notice: If the MCU is programmed to control a timer, the timer must then be setup for operation on the RTP. Failure to do so may cause the MCU to halt execution at that line.

Timer Function: Messages

When programming a line of the MCU for the Timer function, one of the choices is to display a message. To do this:

Choose the "Timer" function.

When prompted to choose a timer, scroll past timer number 8 and the prompt "Display Message" will appear. Press the Enter key.

Choose which one of the 15 messages that you want displayed, then press Enter. The line is now programmed to display the selected message.

After the choice of a message is entered, the programmer will advance to the next line.

Reminder: The RTP will display only what the MCU is programmed to display using the Timer function. The last thing displayed is the last thing instructed by the MCU. If you haven't already, be sure to setup each of the messages that you have programmed the MCU to display.

Tip: Allow a sufficient amount of time between displaying different messages. For example, imagine that we programmed two lines to display a message and one immediately follows the other. The second message would be displayed only 1ms after the first message. It would appear that the first message was never displayed. If we inserted a line in-between and programmed it to wait for a few seconds, we would then be able to see the first message. Consider using one of the other pages to perform the task of displaying multiple messages so that Page A could be dedicated to running the machine.

If you'd like the panel to be blank at some point: program the MCU to display a message that was setup with blanks selected for each character.