



Allen-Bradley Real Time Clock Module

(Cat. No. 1771-DC)

Product Data



Description

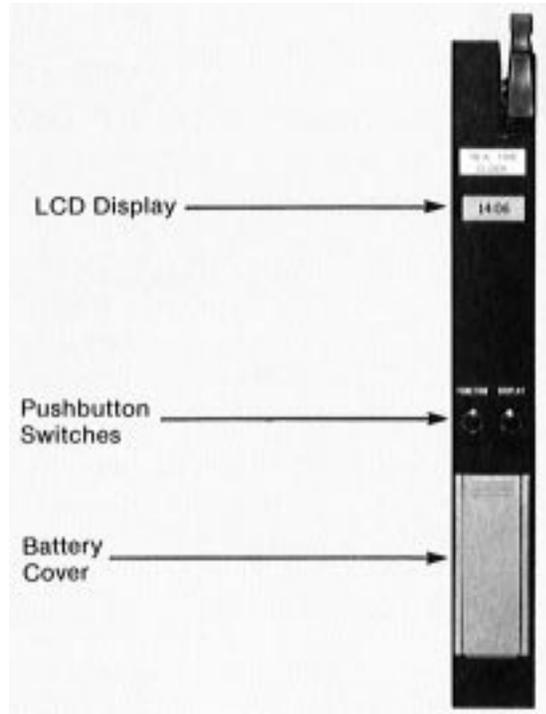
The Real Time Clock Module (cat. no. 1771-DC) allows you or the PC processor to read or set real time and date information. Real time and date information is block transferred to and from the PC processor data table for control and reporting purposes.

The clock module can be used with any Allen-Bradley PC processor having block transfer capability and that uses 1771 I/O.

Module Features

The clock module displays the time and date through the liquid crystal display (LCD). You can set or read the time and date manually through the front panel pushbuttons switches and 4-digit LCD (figure 1). You can program the PC processor to set or read time and calendar information automatically. Also, you can disable the time setting function to guard against unauthorized changes to an installed clock module.

Figure 1
Pushbutton Switches and Display



The clock module measures time in milliseconds. The module maintains quartz crystal accuracy of 60 seconds per month and timer accuracy of +0.25ms, -1.25ms over the normal operating temperature range of 0°C to +60°C (32°F to 140°F). It uses a standard 9V alkaline battery for back-up, and reports self-diagnostic information whenever time and date information is read to the PC processor.

Applications

The accuracy and convenience of the clock module allow you to program many control and reporting applications such as:

- Energy management
- Process synchronization
- Time and event correlation
- Calendar scheduling
- Accurate millisecond timing
- Accurate timing of power failures
- Accurate rate calculations

You can use the clock module with other bulletin 1771 I/O modules in a variety of time-dependent applications.

When you use the clock module as a millisecond timer, you can achieve accurate differential times by starting and stopping the clock in the same scans that the PC processor reads respectively the initial and final measured values.

Operation and Programming

Date and time can be set and read either manually or by the PC processor. The seven date and time functions of the clock module are:

- Day of the week
- Year
- Month
- Day of the month
- Hours
- Minutes
- Seconds

Date and time are displayed as numbers. For example, Tuesday is designated by the module as the second day of the week. It is displayed as a 2. The year 1984 is displayed as 84. The hour is displayed in military 24 hour format, 3:00 PM is 15:00 hours. The clock module corrects for leap year.

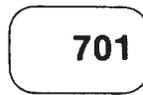
Displaying Date and Time

You can display the date and time using the front panel LCD and the DISPLAY pushbutton switch. The four date and time displays (figure 2) are:

- Month with day of the month
- Year with day of the week
- Running time in minutes and seconds
- Running time in hours and minutes

Figure 2
Display Formats

Calendar Functions



July 1



1983 Friday

Running Time Functions



Minutes : Seconds



Hours : Minutes
(Colon Blinks)

11217

Running time in hours and minutes is normally displayed unless you select one of the other displays by repeatedly pushing the DISPLAY pushbutton switch.

Setting Date and Time

You can set the date and time from the front panel using both the FUNCTION and DISPLAY pushbutton switches. Advance the display to the next time or date function by pressing the FUNCTION pushbutton switch. Then when you press the DISPLAY pushbutton switch, the display counts up until released at your desired setting. If you hold it too long and the count exceeds the setting that you want, you can recycle the counter through its range by continuing to press the DISPLAY pushbutton switch. When you have set all the time and date functions, start the module's clock by pressing FUNCTION and then the DISPLAY pushbutton switch.

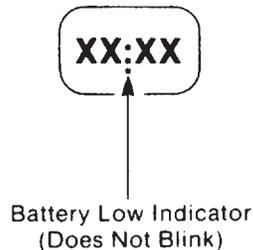
Securing Settings

As a safeguard, you can guard against unauthorized changes to the module's clock and calendar by means of a programming (jumper) plug located at the lower rear opening of the module. Inserting the plug in the lower position disables the FUNCTION pushbutton switch on the front panel but does not disable the DISPLAY pushbutton switch. The upper position enables the FUNCTION switch.

Displaying Diagnostics

The module displays fault and alarm diagnostics. A battery low condition is indicated by the non-blinking display of a single dot beneath the colon in the center of the display (figure 3). When first displayed, only 24 hours of battery operation remain.

Figure 3
Battery Low Indication



11218

The module indicates that power has been restored following a total power failure (no battery back-up) by blinking eights in its LCD. The blinking eights display indicates that previous calendar and clock data have been lost, that the calendar and clock functions have ceased, and you should reset the module's calendar and clock. When you install a battery in an unpowered clock module, the blinking eights display indicates that the module's calendar and clock are ready to be set. Battery back-up allows 100 hours of module operation during power failures or brownouts.

The module monitors internal operation. If a fault is detected, the module's clock will cease and an error number will be displayed in the right-most position of the LCD. In many cases, you can manually reset the module using the reset switch located at the lower rear opening of the module. If the reset procedure does not reset the fault, return the module to your nearest authorized field service office for repair.

Programming

The clock module responds to read and write block transfer instructions. The PC processor reads current time and calendar data from the clock module using read block transfers. The PC processor writes calendar and clock settings to the clock module using write block transfers.

Time and calendar functions can be set and the module started by a single write block transfer if you program the PC processor to perform this operation.

The clock module stores time and calendar data in its buffer memory the moment it receives a request for a block transfer. The data transferred to the PC processor is the data that the module stored when it received the block transfer request.

The module response time of 2.0ms maximum for a read or write block transfer is shorter than the PC processor scan time. Therefore, the module appears ready whenever it receives a request to transfer data.

Power Requirements

Under normal operation, the clock module draws all of its power, 350mA, from the I/O chassis backplane. Include this amount with the power requirements of all modules in the I/O chassis so as not to exceed the 6.5A maximum rating of the backplane or backplane power supply. During a power outage, the module draws only enough power from the battery to operate the clock.

Chassis Location and Keying

You can place the single-slot clock module in any I/O module slot in a bulletin 1771 I/O chassis.

The clock module is not keyed. Other bulletin 1771 I/O modules can be inadvertently placed in the slot reserved for the clock module. However, you cannot place the clock module in an I/O slot keyed for another I/O module.

Specifications

Accuracy

- The total variation in time over the operating temperature range of the module is 60 seconds per month.
- Timing accuracy (independent of transfers): +0.25ms -1.25ms

Module Current Requirement

- 350mA max from the backplane
- 5.0mA max from back-up battery during a power outage

Back-up Battery

- Voltage: 9V DC
- Type: Alkaline such as Duracell 1604A, Eveready 522, or equivalent
- Life: One year standby when the module is powered by the backplane; Up to 100 hours during a power failure including 24 hours from battery low indication until the clock ceases

Module Location

- Any bulletin 1771 I/O chassis, single I/O slot location

Ambient Temperature Rating

- Operational: 0°C to +60°C (32°F to 140°F)
- Storage (without battery): -30°C to +70°C (-32°F to 158°F)

Relative Humidity Rating

- 5% To 85% (without condensation)

Keying

- none



ALLEN-BRADLEY
A ROCKWELL INTERNATIONAL COMPANY

As a subsidiary of Rockwell International, one of the world's largest technology companies — Allen-Bradley meets today's challenges of industrial automation with over 85 years of practical plant-floor experience. More than 11,000 employees throughout the world design, manufacture and apply a wide range of control and automation products and supporting services to help our customers continuously improve quality, productivity and time to market. These products and services not only control individual machines but integrate the manufacturing process, while providing access to vital plant floor data that can be used to support decision-making throughout the enterprise.

With offices in major cities worldwide

**WORLD
HEADQUARTERS**
Allen-Bradley
1201 South Second Street
Milwaukee, WI 53204 USA
Tel: (1) 414 382-2000
Telex: 43 11 016
FAX: (1) 414 382-4444

**EUROPE/MIDDLE
EAST/AFRICA
HEADQUARTERS**
Allen-Bradley Europe B.V.
Amsterdamseweg 15
1422 AC Uithoorn
The Netherlands
Tel: (31) 2975/43500
Telex: (844) 18042
FAX: (31) 2975/60222

**ASIA/PACIFIC
HEADQUARTERS**
Allen-Bradley (Hong Kong)
Limited
Room 1006, Block B, Sea
View Estate
28 Watson Road
Hong Kong
Tel: (852) 887-4788
Telex: (780) 64347
FAX: (852) 510-9436

**CANADA
HEADQUARTERS**
Allen-Bradley Canada
Limited
135 Dundas Street
Cambridge, Ontario N1R
5X1
Canada
Tel: (1) 519 623-1810
FAX: (1) 519 623-8930

**LATIN AMERICA
HEADQUARTERS**
Allen-Bradley
1201 South Second Street
Milwaukee, WI 53204 USA
Tel: (1) 414 382-2000
Telex: 43 11 016
FAX: (1) 414 382-2400