

Model 1084B/C GPS Satellite-Controlled Clock



The Arbiter Systems®, Inc. Model 1084B/C GPS Satellite-Controlled Clock provides the most-needed GPS system clock features in an economical package. Three versions allow you to match your requirements. The Model 1084B has four LEDs to monitor operating status, an LCD setup/status display, and keyboard. The Model 1084C adds a large (20 mm or 0.8 in) LED time display.

In all versions, one BNC output provides modulated IRIG-B while another BNC output is jumper configurable for IRIG-B unmodulated or Programmable Pulse. Both outputs have substantial drive capability and can easily drive multiple loads wired in parallel. A third output is jumper configurable for either one pulse-per-second, IRIG-B unmodulated, or IRIG-B modified Manchester (IEEE Standard 1344 high-precision time code). This third output may also be wired (by a simple modification) to any of the other digital signals generated inside the Model 1084B/C. These signals include rates of 1 PPH, 1 PPM, 10 PPS, 100 PPS, 1 kPPS, 10 kPPS, 100 kPPS, 1 MPPS, 5 MPPS, and 10 MPPS; IRIG-E, IRIG-H, and IRIG-D; Programmable Pulse, or Locked to satellite. Programmable Pulse generates an output pulse every 1 second to 60000 seconds, daily at a specified time,

or at a specified time of year; pulse duration is 0.01 seconds to 600 seconds. An optional fiber-optic output generates 1 PPS or IRIG-B in either unmodulated or modified Manchester format. Also, an event timer input measures time of occurrence of an applied pulse to 100 ns resolution. Up to 500 events may be stored.

The Model 1084B/C includes two Form C (SPDT) fail-safe relays, compatible with 129 Vdc digital fault recorder inputs. The first provides a LOCKED indication, and the second can be selected to the FAULT, 1 PPH, or Programmable Pulse functions.

Twelve receiver channels are standard for best performance, especially in difficult locations. The internal backup oscillator is a digitally-compensated crystal oscillator (DCXO) accurate to 1×10^{-7} over temperature.

Power options include 85 Vac to 264 Vac or 110 Vdc to 370 Vdc with an IEC-320 detachable cordset, 85 Vac to 250 Vac or 110 Vdc to 350 Vdc terminal strip inlet with surge withstand, or 10 Vdc to 60 Vdc terminal strip inlet with surge withstand. The terminal-strip versions have a surge-withstand network designed to meet ANSI/IEEE C37.90-1 and IEC801-4 specifications. All power configurations may be retrofitted in the field.

Model 1084B/C Specifications

Receiver Characteristics

Timing Accuracy

Specifications apply at the 1 PPS output, in the presence of Selective Availability (SA), as of date of publication.

UTC/USNO ± 100 ns rms, 1 PPS output
Typical < 40 ns rms, in Position-Hold Mode

Internal Oscillator

Standard DCXO, 1×10^{-7} , unlocked
Allan variance (locked and in Position-Hold Mode)
 1 second 5×10^{-10} (2×10^{-10} , typical)
 1 day 5×10^{-13}

Synchronization

CMOS output signals are synchronized to the 1 PPS output, ± 50 ns maximum.

IRIG-B modulated, ± 1 μ s maximum

The leading edge of the start bit of a received RS-232 data message may be selected to trigger the Event A input, providing synchronization with 100 ns resolution.

Position Accuracy

10 meters, rms, 90 % confidence

Satellite Tracking

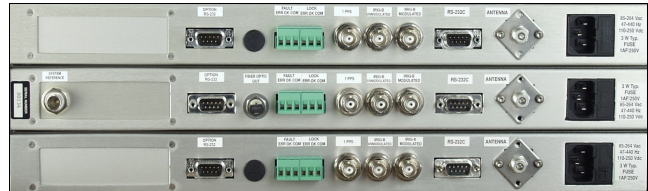
Twelve (12) channel, GPS-L1, C/A code (1575.42 MHz). Receiver simultaneously tracks up to twelve satellites. Results from all tracked satellites are averaged in Position-Hold Mode or, with Position-Hold Mode off, using least-squares estimation.

Acquisition

150 seconds typical, cold start
15 minutes, 90 % confidence, cold start
40 seconds, typical, with almanac < 1 month old
15 seconds, typical, with ephemeris < 4 hours old

The GPS Data Backup Battery is included in all Model 1084s. This feature improves acquisition time by supplying constant power to the real-time clock and RAM in the GPS receiver module.

I/O Configuration



Connectors

Three standard; one IRIG-B modulated connector and two user-configurable connectors:

1. IRIG-B modulated, bus driver, 4 Vpp, 20 ohms source impedance, drives a 50-ohm load at 3 Vpp
2. IRIG-B unmodulated or Programmable Pulse; jumper-selectable
3. 1 PPS, IRIG-B unmodulated or IRIG-B modified Manchester; jumper-selectable

Jumper-selectable outputs are 5 V CMOS bus drivers with 10 ohms source impedance and ± 75 mA drive capability.

Relay Contacts

Two (2) sets, Form C (SPDT) fail-safe, 0.3 A at 130 Vdc; one is Locked function; the second one is jumper-selectable and may be Fault, 1 PPH, or Programmable Pulse

Programmable Pulse Output

Four modes:

- Every 1 s to 60,000 s, starts top of the minute
- Hourly at a specified offset
- Daily at a specified time of day
- One shot at a specified time of year

Pulse duration is programmable from 0.01 seconds to 600 seconds, except in one-shot mode, where the output is Low prior to the specified time and High thereafter.

Event A Input

One input is available as an alternate function, with a simple hardware modification to the 1 PPS configurable output. The input may be configured to accept an external 1 PPS signal and measure the deviation from 1 PPS/GPS with 100 ns resolution. Each input may also be configured to record up to 500 sequential events with 100 ns resolution, provided that the events are separated by 11 ms. Event data is stored in battery-backed RAM.

Model 1084B/C Specifications

Interface		Power Requirements	
Operator		Standard (Option 07)	
Display	2 x 20 character supertwist LCD (Models 1084B/C only) 20 mm (0.8 in) LED; 9 digits (Model 1084C only)	Voltage	85 Vac to 264 Vac, 47 Hz to 440 Hz, 20 VA max. or 110 to 370 Vdc, 15 W max.
Functions	Time: UTC or local Position: latitude, longitude, altitude Receiver and clock status 1 PPS (input) deviation Event time	Inlet	IEC-320 with fuse and mating cordset. Specify cordset P01 - P10
Status LEDs	Operate (green) On Line (green) Unlocked (red) Fault (red)	General	
Keyboard Setup	Eight keys (Models 1084B/C only) Local time offset Output code select: Local/UTC Recorder output A Daylight Saving Time: On/Off/Automatic Backlight control: On/Off/Automatic Event input: Event/1 PPS Programmable Pulse setup Antenna delay Clock offset Out-of-Lock time: 1 min. to 99 minutes, Off, or Zero Delay Auto-Survey: On/Off, Survey duration Position Hold: On/Off, Position Auto/Manual Option Configuration and Setup Serial port: RS-232	Physical	
System		Environmental	
RS-232	1200 baud to 19,200 baud; 7 or 8 data bits; 1 or 2 stop bits; even/odd/no parity Broadcast modes include ASCII, Extended ASCII, ASCII with Time Quality, and Vorne (output once every second), Status (output on change of Status) and Event (output on an Event) Male 9-pin D-sub; Second port available (order number 1084opt19)	Size	1 RU rack mount or tabletop; 260 mm deep FMS. Rack mounts included 635 mm x 381 mm x 229 mm (25 in x 15 in x 9 in), shipping
RS-422/485	Transmit only	Weight	2 kg (4.5 lbs), net 5.5 kg (12 lbs), shipping
		Antenna	0.75 in pipe (1 in - 14 marine) thread Cable Connection: F-type 80 mm hex (across flats) x 84 mm (3.2 in x 3.3 in) 170 grams (6.0 oz)
		Antenna Cable	RG-6 type, 15 m (50 ft) provided Weight: 0.69 kg (1.52 lbs) per 15 m
		Temperature	Operating: 0 °C to + 50 °C (- 20 °C to + 70 °C typical) Nonoperating: - 40 °C to + 75 °C
		Humidity	Noncondensing
		EMC	Radiated susceptibility: passes walkie-talkie test Conducted emissions: power supply complies with FCC 20780, Class A and VDE 0871/6.78 Class A Surge withstand capability (SWC), power inlet: designed to meet ANSI/IEEE C37.90-1 and IEC 801-4
		Certifications and Approvals	
		CE mark/label and certificate	

Model 1084B/C Specifications

Options

Except as noted otherwise, only one I/O Option may be installed.

I/O

<u>Description</u>	<u>Order No.</u>
Parallel BCD Output 1 ms Resolution	1084opt06
BCD Output with Second RS-232 Port	1084opt17
Second RS-232 Port	1084opt19 ¹
Fiber-Optic Output, Type ST 820 nm	1084opt20 ²
Four Configurable Fiber-Optic Outputs	1084opt20A
COMTRADE Sample Rate Generator	1084opt23
8-Channel High-Drive IRIG-B Output	1084opt27
Power System Time, Frequency and Phase Monitor	1084opt28
Four Additional Outputs with Dry Contact and + 25/50 Vdc	1084opt29
Network Time Protocol (NTP) / Precision Time Protocol (PTP) Server	1084opt34
Four Configurable Outputs	1084opt36

Power (select only one)

<u>Description</u>	<u>Order No.</u>
IEC-320 Power Inlet, 85 Vac to 264 Vac, 110 Vdc to 370 Vdc	1084opt07
Terminal Power Strip, Surge Withstand 10 Vdc to 60 Vdc	1084opt08
Terminal Power Strip, Surge Withstand 85 Vac to 250 Vac, 110 Vdc to 350 Vdc	1084opt10

General

<u>Description</u>	<u>Order No.</u>
LCD Backlight	1084Bopt01 1084Copt01
On/Off Switch	1084Bopt04

Accessories

Included

<u>Description</u>	<u>Order No.</u>
GPS Antenna, pipe mountable	AS0087800
15 m (50 ft) RG-6 Antenna Cable	CA0021315
19 in Rack Mount Kit	AS0028200
Quick Setup Guide	PD0052500
Power Cord (with Option 07)	P09

Available

<u>Description</u>	<u>Order No.</u>
Power Cord	P01-P10
Operation Manual	AS0031000
15 m (50 ft) RG-6 Antenna Cable	CA0021315
30 m (100 ft) RG-6 Antenna Cable	CA0021330
45 m (150 ft) RG-6 Antenna Cable	CA0021345
60 m (200 ft) RG-6 Antenna Cable	CA0021360
75 m (250 ft) RG-6 Antenna Cable	CA0021375
GPS Antenna Mounting Bracket	AS0044600
21 dB In-Line Preamplifier	AS0044700 ³
Antenna Grounding Block Kit	AS0048900
GPS Surge Protector	AS0094500
GPS Antenna Cable Splitter	AP0013400
BNC (Male) Breakout to 100 mm Wires	AP0003400
BNC (Female) Breakout to 100 mm Wires	AP0008900
BNC (Female) Breakout to Screw Terminal	AP0014900
BNC (Male) Breakout to Screw Terminal	AP0015000
300 m (1000 ft) Roll RG-6 Cable	WC0005000
RG-6 Stripping Tool	TF0013200
RG-6 Type F Crimp Tool	TF0006400
RG-6 Type F Male Crimp-on Connector	CN0027700
300 m (1000 ft) Roll RG-11 Cable	WC0004900
RG-11 Stripping Tool	TF0013300
RG-11 Type F Crimp Tool	TF0006000
RG-11 Type F Male Crimp-on Connector	CN0027800
19 in Rack Slide Kit	AS0033100
24 in Rack Mount Kit	AS0056600

¹ May be combined only with other I/O options that do not include an additional RS-232 Port

² May be combined with other I/O options

³ Used for cable length greater than 75 m (250 ft)

Model 1084B/C Specifications**Cordset and Plug Styles**

The following are the available IEC-320 mating cordset plug style and specifications:

<u>No.</u>	<u>Country</u>	<u>Specification</u>	<u>Rating</u>
P01	Continental Europe	CEE 7/7	220V
P02	Australia/NZ/PRC	AS 3112-1981	240V
P03	U.K.	BS 1363	240V
P04	Denmark	Afsnit 107-2-01	240V
P05	India	BS 546	220V
P06	Israel	SI 32	220V
P07	Italy	CEI 23-16/VII 1971	220V
P08	Switzerland	SEV 1011.1959	220V
P09	North America and ROC	NEMA 5-15P CSA C22.2 #42	120V
P10	Japan	JIS8303	120V