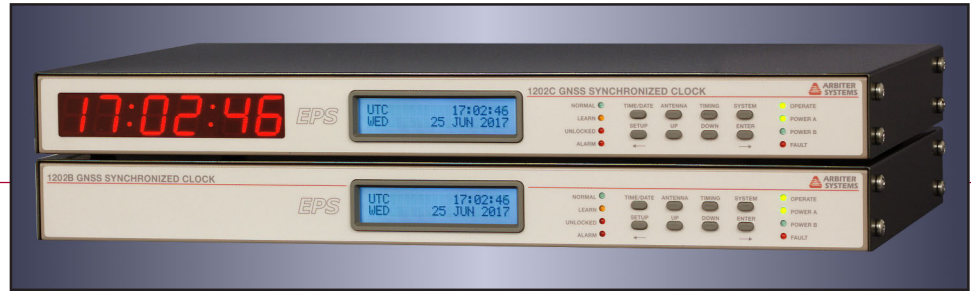


Model 1202B/C GNSS Synchronized Clock



featuring

EPS**Enhanced Performance and Security**

The Arbiter Systems®, Inc. Model 1202B/C GNSS Synchronized Clock is a multi-satellite system (GPS/GLONASS/Galileo/BeiDou) timing source for precision applications. Arbiter Systems' next-generation substation clock provides enhanced performance and security (EPS) while supporting the standard outputs and popular options of our existing clocks. EPS benefits include multi-system timing sources, standard holdover oscillator, multiple levels of user security, secure communications, and anti-spoofing technology. The Model 1202B/C is compatible with Arbiter Systems' earlier clock models, supporting the same legacy options and outputs, while enabling the transition to a more secure device.

The Model 1202 is available in two versions. The Model 1202B has eight status LEDs, an LCD setup/status back-lit display, and a keyboard. The Model 1202C adds a large (20 mm or 0.8 in) LED time display. Both versions have 72 receiver channels, capable of tracking all visible GNSS satellites simultaneously, providing optimum performance. The Model 1202B/C has 100 ns worst-case accuracy to meet the requirements of a broad range of applications from relay synchronization to synchrophasor timing. The standard holdover oscillator maintains 1 ms/24 h accuracy when not tracking satellites. In addition to enhanced performance, Arbiter Systems' new EPS technology provides six levels of user security selectable from Level 0 security (none) to Level 5 security (front panel display, keyboard, and legacy serial commands disabled). Spoofing concerns are a thing of the past with patent granted anti-spoofing algorithms, multi-system satellite tracking, and holdover oscillators

that limit the time error to the holdover oscillator specification. If spoofing is suspected/detected, the user is alerted by the ALARM indicator.

Six BNC outputs (3 programmable high-drive and 3 jumper configurable) provide IRIG-B unmodulated, 1 PPS, and Programmable Pulse, Modulated IRIG-B outputs along with an Event Input. The three high drive outputs are independently set to any of the programmable pulse modes and provide ± 125 mA of drive current. The three configurable outputs are selectable for 5 V CMOS bus drivers (± 75 mA drive capability); 4 Vpp, 20 ohms source impedance (IRIG-B modulated only) drivers; or an event timer channel with 100 ns resolution. The event function may be driven by the start bit of a received character on the serial port or an external 5 V CMOS/TTL signal on one of the BNC connectors. The Model 1202B/C comes standard with one DB-9 communication port and the option to add a second port. An RS-422/485 transmit only driver is standard on the main communication port.

Two SPDT (form C) fail-safe relays are also included and are configurable to Out-of-Lock, Fault, Alarm, Stabilized, or Programmable Pulse. The Model 1202B/C accepts one or two power supplies in a redundant configuration. Standard power options include a universal 100 Vac to 240 Vac/100 Vdc to 350 Vdc or 24 Vdc to 48 Vdc supplies with secure terminal strip inlets and surge-withstand capability. The surge-withstand network is designed to meet ANSI/IEEE C37.90-1 and IEC 61000-4 specifications. Available options include Four Additional Configurable Outputs; High Drive IRIG-B Outputs; Power System Time, Frequency, and Phase Monitor; NTP/PTP Server.

Model 1202B/C Specifications



Receiver Characteristics

Timing Accuracy

Specifications apply at the 1 PPS/IRIG-B/PP outputs when receiving four or more satellites, as of date of publication.

UTC/USNO ± 100 ns peak

Holdover Oscillator

Standard OCXO, 1 ms/24 h

Patents High-Reliability Holdover Method and Topologies: No. US 9,362,926 B2 & US 9,979,406 B2

Position Accuracy

2 meters, rms

Satellite Tracking

Seventy-two (72) channel receiver: L1 GPS C/A, L1 GLONASS CT, Galileo E1-B/C, BeiDou B1.

Acquisition

55 seconds, typical, cold start

25 seconds, typical, warm start

3 seconds, typical, hot start

I/O Configuration

IRIG-B

One IRIG-B channel that controls both the unmodulated and modulated outputs. Configurable to Local or UTC time with C37.118.1 on or off, settings independent from Programmable Pulse IRIG-B output.

Relays

Two Form C (SPDT) fail-safe, 8 A at 250 Vac; configurable to Out-of-Lock, Fault, Alarm, Stabilized, or Programmable Pulse

Event

One event timer channel with 100 ns resolution is standard. This function may be driven by the start bit of a received character on the serial port or an external 5 V CMOS/TTL signal at one of the terminal strip connectors (jumper-selectable).

I/O Configuration (Continued)

Programmable Pulse

Four programmable pulse outputs (one jumper configurable to ports 1-3 and 1 each for ports 4-6).

Modes:

- IRIG-B unmodulated (UTC/Local, C37.118.1 On/Off)
- IRIG-B manchester (UTC/Local, C37.118.1 On/Off)
- Every 1 to 60,000 seconds, starts top of the second
- Hourly at a specified offset
- Daily at a specified time of day
- One shot at a specified time of year
- Slow Code (UTC/LCL)
- DCF-77
- 1 KHz
- 100 Hz

Pulse polarity and pulse duration are programmable, duration from 0.01 to 600 seconds, except in one-shot mode, where the output is Low prior to the specified time and High thereafter. IRIG-B settings independent from main IRIG-B signal.

Connectors

Six BNC connectors:

Port 1: IRIG-B unmodulated, 1 PPS, Programmable Pulse or IRIG-B modulated; jumper-selectable

Port 2: IRIG-B unmodulated, 1 PPS, Programmable Pulse, IRIG-B Modified Manchester or IRIG-B modulated; jumper-selectable

Port 3: IRIG-B unmodulated, 1 PPS, Programmable Pulse or Event Input; jumper-selectable

Port 4: High-drive Programmable Pulse

Port 5: High-drive Programmable Pulse

Port 6: High-drive Programmable Pulse

Jumper-selectable outputs are 5 V CMOS bus drivers with 10 ohms source impedance and ± 75 mA drive capability or 4 Vpp, 20 ohms source impedance (IRIG-B modulated only). High-drive outputs are 5 V FET drivers with ± 125 mA drive capability.

Model 1202B/C Specifications

Interface

Operator

Display	2 x 20 character supertwist LCD White LED backlight 20 mm (0.8 in) LED; 6 digits (Model 1202C)
Functions	Time and date Antenna status and position Timing status System status
Status LEDs	Normal (green) Learn (orange) Unlocked (red) Alarm (red) Operate (green) Power A (green) Power B (green) Fault (red)
Keypad	8 keys; select display functions or setup menus
Setup	COM 1 (RS-232 port 1) Local time offset Out-of-Lock Time Relay Configuration Backlight Control Event/Deviation Programmable Pulse System Delays IRIG Time Data Option Configuration

System

RS-232	1200 baud to 230400 baud; 7 or 8 data bits; 1 or 2 stop bits; even/odd/no parity 2 Male 9-pin D-subminiature Includes the following broadcast modes: Interrogate (default), standard ASCII (IRIG-J), Vorne large-display, status/alarm, extended ASCII, event data, ASCII with time-quality, ASCII with year and user configurable serial time code
COM1	RS-232 (TXD, RXD, GND) RS-422/485 (TXD+, TXD-)
COM2 (optional)	RS-232 (TXD, RXD, GND)

Power Requirements

Accommodates any combination of the two available power supplies in a single or redundant configuration. Choices include an universal supply or a low dc supply, both with surge withstand capability.

Universal

Voltage	100 Vac to 240 Vac, 47 to 440 Hz, 20 VA max. or 100 Vdc to 350 Vdc, 30 W maximum
Inlet	Secure Pluggable Terminal Strip

Low DC

Voltage	24 Vdc to 48 Vdc, 30 W maximum
Inlet	Secure Pluggable Terminal Strip

General

Physical

Size	425 mm x 280 mm x 44 mm (16.75 in x 11 in x 1.75 in) 19 in, 1 Rack Unit; 280 mm deep FMS. Rack mounts included 635 mm x 381 mm x 229 mm (25 in x 15 in x 9 in), shipping
Weight	2 kg (4.5 lbs), net 5.5 kg (12 lbs), shipping
Ground Block	Antenna protective ground Copper, with M5 (10-32) stud and nut Internallightning surge suppressor (GDT)
Antenna	3/4 in NPT (1 in - 14 marine) thread Cable Connection: F-type Temperature: - 55 °C to + 65 °C Size: 80 mm dia. x 84 mm (3.2 in x 3.3 in) Weight: 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

Environmental

Temperature	Operating: - 40 °C to + 65 °C Nonoperating: - 40 °C to + 75 °C
Humidity	Noncondensing
EMC	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 61000-4

Model 1202B/C Specifications

Options

Select one option from each category; except Power Supply which accommodates two. One power supply and holdover oscillator must be specified.

<u>Description</u>	<u>Order No.</u>
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Power Supply

Terminal Power Strip, Surge Withstand, 100 Vac to 240 Vac, 100 Vdc to 350 Vdc	A01/B01
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Terminal Power Strip, Surge Withstand, 24 Vdc to 48 Vdc	A02/B02
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Holdover Oscillator

Holdover OCXO 1 ms/24 h	C01
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Main Board I/O

Single Configurable Fiber-Optic Output	D01
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Slot A

Second RS-232 Port	E01
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Frequency and Time Monitor	E02
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Programmable Pulse/IRIG-B Over RS-485	E03
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Slot B

Four Configurable Outputs	F01
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Four Configurable Fiber-Optic Outputs	F02
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Eight-Channel High-Drive IRIG-B Output	F03
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Power System Time, Frequency and Phase Monitor	F04
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Four Additional Outputs with Dry Contact and +25/50 Vdc	F05
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NTP/PTP Server Copper/Copper	F06
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NTP/PTP Server Copper/Fiber	F07
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NTP/PTP Server Fiber/Fiber	F08
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Options (Continued)

Relay

Standard Voltage (30 Vdc/250 Vac)	G01
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High DC-Voltage (300 Vdc/250 Vac)	G02
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Accessories

<u>Description</u>	<u>Order No.</u>
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Included

GNSS Antenna, pipe mountable	AS0099200
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Quick Setup Guide	PD0055700
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15 m (50 ft) RG-6 Antenna Cable ¹	CA0021315
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Rack Mount Kit	AS0094800
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Available

Operation Manual	AS0107900
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Antenna Mounting Kit	AS0044600
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15 m (50 ft) RG-6 Antenna Cable ¹	CA0021315
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30 m (100 ft) RG-6 Antenna Cable ¹	CA0021330
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45 m (150 ft) RG-6 Antenna Cable ¹	CA0021345
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60 m (200 ft) RG-6 Antenna Cable ¹	CA0021360
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75 m (250 ft) RG-6 Antenna Cable ¹	CA0021375
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21 dB In-Line Antenna Preamplifier	AS0044700
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Antenna Surge Protector	AS0094500
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Antenna Grounding Block Kit	AS0048900
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BNC (Male) Breakout to 100 mm Wires	AP0003400
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BNC (Female) Breakout to 100 mm Wires	AP0008900
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BNC (Male) Breakout to Screw Terminal	AP0014900
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BNC (Female) Breakout to Screw Terminal	AP0015000
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¹ RoHS compliant

Order Guide

Model	Power Supply A	Power Supply B	Holdover Oscillator	Main Board I/O	Option Slot A	Option Slot B	Relay
1202B	A01	B00*	C01	D00*	E00*	F00*	G01
1202C	A02	B01		D01	E01	F01	G02
		B02			E02	F02	
					E03	F03	
						F04	
						F05	
						F06	
						F07	
						F08	

*Indicates option not installed.

Example:

1202B-A01-B00-C01-D00-E01-F01-G01

Model 1202B with LCD display
Power Supply A: 100 to 240 Vac
/100 to 350 Vdc
Power Supply B: Not installed
Holdover Oscillator: 1 ms/day
Main Board I/O: Not installed
Slot A: Second RS-232 Port
Slot B: Four Configurable Outputs
Relay: Std. V (30 Vdc/250 Vac)