Model 1200B
GNSS Synchronized Clock

The Arbiter Systems® Model 1200B GNSS Synchronized Clock is a multi-satellite system (GPS/GLONASS/Galileo/BeiDou) timing source for precision timing applications. Designed with the advanced features of our 12xx line of clocks to give optimum performance without a holdover oscillator at an economical price. The Model 1200B is compatible with Arbiter’s earlier clock models, supporting the standard options and outputs, while enabling the transition to a modern design.

The Model 1200B has eight status LEDs, an LCD setup/status back-lit display, and a keyboard. The Model 1200B comes standard with 72 receiver channels, capable of tracking GNSS satellites simultaneously, providing optimum performance. The Model 1200B has 200 ns worst-case accuracy to meet the requirements of a broad range of applications from relay synchronization to synchrophasor timing. In addition to enhanced performance, Arbiter Systems’ new security feature 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).

Three pluggable terminal strip outputs (jumper configurable) provide IRIG-B unmodulated, 1 PPS, Programmable Pulse or Event Input. A modulated IRIG-B output is also available on the center pluggable terminal strip output. These outputs are configurable to provide 5 V CMOS bus drivers (± 75 mA drive capability) or 1 watt power dissipation open-drain FET (excludes IRIG-B modulated) or 4 Vpp, 20 ohms source impedance (IRIG-B modulated only) drivers. An 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. The Model 1200B comes standard with two DB-9 serial communication ports. One also provides an RS-422/485 transmit only driver and a programmable pulse output.

An SPDT (form C) fail-safe relay is also included and is configurable to Out-of-Lock, Fault, Alarm, Stabilized, or Programmable Pulse. The Model 1200B accepts one or two power supplies in a redundant configuration. Standard power options include an 100 Vac to 240 Vac/100 Vdc to 350 Vdc or 22 Vdc to 67 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; Four BNC Output Connectors (parallels main outputs).
## Model 1200B 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 ± 200 ns peak

**Position Accuracy**
2 meters, rms

**Satellite Tracking**
Seventy-two (72) channel receiver: L1 GPS C/A, L1 GLONASS CT, Galileo, BeiDou.

**Acquisition**
- 55 seconds, typical, cold start
- 25 seconds, typical, warm start
- 3 seconds, typical, hot start

### I/O Configuration (Continued)

**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.

**Programmable Pulse**
One programmable pulse output (by a jumper connection) that may be output on a terminal strip connector and the AUX OUT pin on either COM port.

Seven modes:
- IRIG-B unmodulated (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

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 are independent from main IRIG-B signal.

**Relay**
Form C (SPDT) fail-safe, 8 A at 250 Vac (5 A at 30 Vdc) ; 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).
Model 1200B Specifications

Interface

Operator
Display 2 x 20 character supertwist LCD
White LED backlight

Functions
Time and date
Antenna status and position
Timing status
System status

Status LEDs
Normal (green)
Survey (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)
COM 2 (RS-232 port 2)
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
Has Interrogate (normal) and six Broadcast modes: standard ASCII (IRIG-J), Vorne large-display, status/alarm, extended ASCII, event data, ASCII with time-quality and user configurable serial time code

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

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

Low DC
Voltage 22 Vdc to 67 Vdc, 30 W maximum
Inlet Secure Pluggable Terminal Strip

General

Physical
Size 438 mm x 280 mm x 44 mm (17.25 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
Internal lightning surge suppressor (GDT)

Antenna 3/4 in NPT (1 in - 14 marine) thread
Cable Connection: F-type
Temperature: -55 °C to +70 °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 1200B Specifications

## Options

One option can be selected from each of the categories listed below; except Power Supply which accommodates two. A power supply must be specified.

<table>
<thead>
<tr>
<th>Description</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power Supply</strong></td>
<td></td>
</tr>
<tr>
<td>Terminal Power Strip, Surge Withstand, 100 Vac to 240 Vac, 100 Vdc to 350 Vdc</td>
<td>A01/B01</td>
</tr>
<tr>
<td>Terminal Power Strip, Surge Withstand, 22 Vdc to 67 Vdc</td>
<td>A02/B02</td>
</tr>
<tr>
<td><strong>Main Board I/O</strong></td>
<td></td>
</tr>
<tr>
<td>Single Configurable Fiber-Optic Output</td>
<td>D01</td>
</tr>
<tr>
<td>** Auxiliary I/O**</td>
<td></td>
</tr>
<tr>
<td>Four Configurable Outputs</td>
<td>E01</td>
</tr>
<tr>
<td>Four Configurable Fiber-Optic Outputs</td>
<td>E02</td>
</tr>
<tr>
<td>Eight-Channel High-Drive IRIG-B Output</td>
<td>E03</td>
</tr>
<tr>
<td>Power System Time, Frequency and Phase Monitor</td>
<td>E04</td>
</tr>
<tr>
<td>Four Additional Outputs with Dry Contact and +25/50 Vdc</td>
<td>E05</td>
</tr>
<tr>
<td>NTP/PTP Server Copper/Copper</td>
<td>E06</td>
</tr>
<tr>
<td>NTP/PTP Server Copper/Fiber</td>
<td>E07</td>
</tr>
<tr>
<td>NTP/PTP Server Fiber/Fiber</td>
<td>E08</td>
</tr>
<tr>
<td>Four BNC Output Connectors (Parallel to Pluggable Terminal Strip)</td>
<td>E09</td>
</tr>
</tbody>
</table>

## Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Included</strong></td>
<td></td>
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<tr>
<td>Arbiter Universal GNSS Antenna</td>
<td>AS0099200</td>
</tr>
<tr>
<td>Quick Setup Guide</td>
<td>PD0057100</td>
</tr>
<tr>
<td>15 m (50 ft) RG-6 Antenna Cable&lt;sup&gt;1&lt;/sup&gt;</td>
<td>CA0021315</td>
</tr>
<tr>
<td>Rack Mount Kit</td>
<td>AS0094800</td>
</tr>
<tr>
<td><strong>Available</strong></td>
<td></td>
</tr>
<tr>
<td>Operation Manual</td>
<td>AS0110500</td>
</tr>
<tr>
<td>Antenna Mounting Kit</td>
<td>AS0044600</td>
</tr>
<tr>
<td>15 m (50 ft) RG-6 Antenna Cable&lt;sup&gt;1&lt;/sup&gt;</td>
<td>CA0021315</td>
</tr>
<tr>
<td>30 m (100 ft) RG-6 Antenna Cable&lt;sup&gt;1&lt;/sup&gt;</td>
<td>CA0021330</td>
</tr>
<tr>
<td>45 m (150 ft) RG-6 Antenna Cable&lt;sup&gt;1&lt;/sup&gt;</td>
<td>CA0021345</td>
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<tr>
<td>60 m (200 ft) RG-6 Antenna Cable&lt;sup&gt;1&lt;/sup&gt;</td>
<td>CA0021360</td>
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<tr>
<td>75 m (250 ft) RG-6 Antenna Cable&lt;sup&gt;1&lt;/sup&gt;</td>
<td>CA0021375</td>
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<tr>
<td>21 dB In-Line Preamplifier for cable lengths greater than 100 m</td>
<td>AS0044700</td>
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<tr>
<td>GNSS Antenna Surge Arrester</td>
<td>AS0094500</td>
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<tr>
<td>Antenna Grounding Block Kit</td>
<td>AS0048900</td>
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<tr>
<td>BNC (Male) Breakout to 100 mm Wires</td>
<td>AP0003400</td>
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<tr>
<td>BNC (Female) Breakout to 100 mm Wires</td>
<td>AP0008900</td>
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<tr>
<td>BNC (Female) Breakout to Screw Terminal</td>
<td>AP0014900</td>
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<tr>
<td>BNC (Male) Breakout to Screw Terminal</td>
<td>AP0015000</td>
</tr>
</tbody>
</table>

<sup>1</sup>RoHS compliant

## Order Guide

<table>
<thead>
<tr>
<th>Model</th>
<th>Power Supply A</th>
<th>Power Supply B</th>
<th>Holdover Oscillator</th>
<th>Main Board I/O</th>
<th>Auxiliary I/O</th>
</tr>
</thead>
<tbody>
<tr>
<td>1200B</td>
<td>A01</td>
<td>B00*</td>
<td>C00*</td>
<td>D00*</td>
<td>E00*</td>
</tr>
<tr>
<td></td>
<td>A02</td>
<td>B01, B02</td>
<td></td>
<td>D01</td>
<td>E01, E02, E03, E04, E05, E06, E07, E08, E09</td>
</tr>
</tbody>
</table>

<sup>*</sup>Indicates option not installed.

**Example:**

1200B-A01-B00-C00-D00-E06

Model 1200B with LCD display

Power Supply A: 100 to 240 Vac/100 to 350 Vdc

Power Supply B: Not installed

Holdover Oscillator: Not installed

Main Board I/O: Not installed

Auxiliary I/O: NTP/PTP Server with RJ-45 Ethernet connectors