Specifications subject to change.

Model 1206B/C
GNSS Synchronized Clock

featuring

EPS
Enhanced Performance and Security

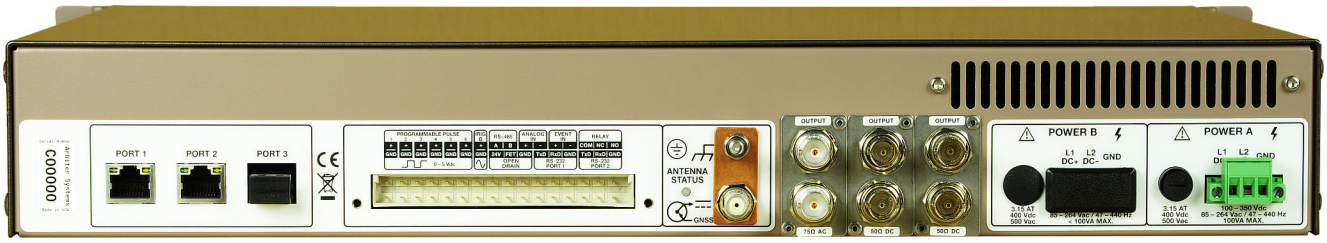
The Arbiter Systems®, Inc. Model 1206B/C GNSS Synchronized Clock is a multi-satellite system (GPS/GLONASS/Galileo/BeiDou) timing source for precision timing applications. Arbiter's next-generation substation clock provides enhanced performance and security (EPS) along with the wide range of functions you have come to expect from the leader in timing for the power industry. EPS benefits include multi-system timing sources, standard holdover oscillator, multiple levels of security, secure communications, and anti-spoofing technology.

The Model 1206 is available in two versions: the Model 1206B and the Model 1206C. The Model 1206B has eight status LEDs, an LCD status back-lit display, and a keyboard. The Model 1206C adds a large (20 mm or 0.8 in) LED time display. Both versions have 72 receiver channels, capable of tracking GNSS satellite systems simultaneously, providing optimum performance. Real time continuous estimation of actual holdover errors, oscillator trajectory prediction and high reliability architecture provide exceptional accuracy and stability allowing the Model 1206B/C (100 ns worst-case accuracy) to meet the requirements of a broad range of applications from relay synchronization to phasor timing. This accuracy applies to the PTP network timing, the high drive programmable pulse (including IRIG-B) outputs and optional outputs. The rubidium holdover oscillator maintains accuracy of 1 µs/24 hours when not tracking satellites. In addition to enhanced performance, Arbiter Systems' new EPS technology includes GNSS anti-spoofing and secure password-protected and encrypted configuration interface providing robust, reliable synchronization to help comply with latest NERC-CIP requirements.

The Model 1206B/C timing signals are available via the three Ethernet ports, the thirty-two pin terminal block and from the available option slots. The three 10/100 Ethernet ports (copper standard, fiber optional) provide status, configuration as well as network timing supporting the NTP, SNTP, PTP (Power Profile supported), SNMP, ICMP, TCP, SSH, SSL, HTTP, HTTPS and DHCP protocols. The thirty-two pin terminal block provides access to the Model 1206B/C standard inputs, outputs and serial communication ports. Two inputs, an event timer and a frequency monitor, are included along with six Programmable Pulse outputs, a modulated IRIG-B output, a FET output, relay contacts, two RS-232 ports and a RS-422/485 port (transmit only). The event timer, 100 ns resolution, accepts an external 5 V CMOS/TTL signal while the frequency monitor accepts a single phase AC voltage input (50/60 Hz, 300 Vac). The Programmable Pulse high-drive outputs (5 Vdc, 125 mA) are user configurable to unmodulated IRIG-B (UTC, Local, C37.118.1) or pulse output (one pulse a second to one pulse a day). The modulated IRIG-B outputs a 4 Vpp (20 ohms source impedance) signal and supports C37.118.1. An SPDT (form C) fail-safe relay is also included and is configurable to Out-of-Lock, Fault, Alarm, Stabilized, or Programmable Pulse. Three legacy serial communications ports (two RS-232 ports and a RS-422/485 port (transmit only) are included for monitoring and status information. Optional outputs include frequency, (5, 10, 1.544, and 2.048 MHz), configurable fiber optic, configurable 24 V, additional programmable pulse, and additional modulated IRIG-B outputs.

The Model 1206B/C accepts one or two power supplies in a redundant configuration and redundant GNSS inputs. Standard power options include an 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. Also included is a built-in lightning arrestor and rear panel ground plate to protect against secondary lightning strikes and other antenna coupled surges.

Model 1206B/C Specifications



Timing and Receiver Characteristics

Timing Accuracy

Specifications apply at the 1 PPS/IRIG-B/PP/PTP outputs when receiving one satellite in position hold mode, as of date of publication.

UTC/USNO	± 100 ns peak
typical	± 40 ns peak

Position Accuracy

2 meters, rms

Satellite Tracking

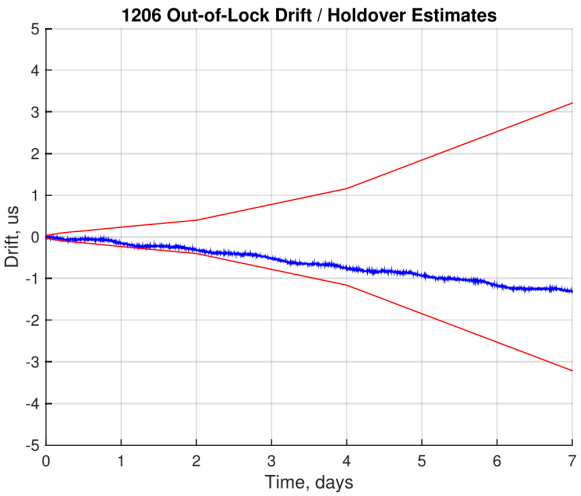
Seventy-two (72) channel receiver: L1 GPS C/A, L1 GLONASS CT, Galileo, BeiDou.

Acquisition

55 seconds typical, cold start
25 seconds, typical, warm start
3 seconds, typical, hot start

Holdover Oscillator

Rubidium	1 µs/24 h
Patents	High-Reliability Holdover Method and Topologies: No. US 9,362,926 B2 & US 9,979,406 B2



Interface

Front Panel

Display	2 x 20 character supertwist LCD White LED backlight 20 mm (0.8 in) LED; 6 digits (Model 1206C)
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
USB	Micro-USB

System

Network	3 Ethernet ports; 10/100 BT (standard) or Fiber (optional)
Protocols	NTP, SNTP, PTP (Power Profile) SNMP, ICMP, TCP, SSH, SCP, SSL HTTP, HTTPS, DHCP
Setup	Web based configuration
Serial	2 RS-232 ports (TXD, RXD, GND) 1 RS-422/485 (TXD+, TXD-) 1200 to 230400 baud; 7 or 8 data bits; 1 or 2 stop bits; even/odd/no parity Has Interrogate (RS-232 only) 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

Arbiter Systems, Inc. · 1324 Vendels Circle, Suite 121 · Paso Robles, CA 93446 · USA
Tel: +1.805.237.3831 · Fax: +1.805.238.5717 · E-mail: sales@arbiter.com · Internet: http://www.arbiter.com

Model 1206B/C Specifications

I/O Configuration

Connectors

One 32 pin pluggable terminal strip connector:

Programmable Pulse (six outputs)
IRIG-B modulated, MOSFET
Analog Input, Event Input
Relay Contacts, RS-232 (2 ports)
RS-485 (transmit only)Programmable Pulse

Programmable Pulse

Six programmable pulse outputs, high-drive 5 Vdc (125 mA at > 4 V). Available signals:

- 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
- 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 independent from main IRIG-B signal.

IRIG-B Modulated

One IRIG-B modulated output, 4 Vpp, 20 ohms source impedance. Configurable to Local or UTC time with C37.118.1 on or off, settings independent from Programmable Pulse IRIG-B output.

MOSFET

300 volt, 1 watt power dissipation open-drain FET driver with 24 Vdc output.

Analog Input

One single phase AC line voltage (50/60 Hz, 300 Vac) input provides accurate measurements of system frequency, frequency error and time deviation.

Event Input

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.

Relay

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

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, 75 W maximum
Inlet	Secure Pluggable Terminal Strip

Low DC

Voltage	24 to 48 Vdc, 75 W maximum
Inlet	Secure Pluggable Terminal Strip

General

Physical

Size	438 mm x 350 mm x 66 mm (17.25 in x 13.75 in x 2.6 in) 19 in, 1.5 Rack Unit; 350 mm deep FMS. Rack mounts included 508 mm x 508 mm x 305 mm (20 in x 20 in x 12 in), shipping
Weight	3.5 kg (7.8 lbs), net 6.8 kg (15 lbs), shipping
Ground Block	Antenna protective ground Copper, with M5 (10-32) stud and nut Internal lightning surge suppressor (GDT)
Antenna	3/4" 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: - 20 °C to + 40 °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 1206B/C Specifications

Options

Up to 2 Power Supply options and 3 Auxiliary I/O options can be accommodated. A power supply must be specified.

Description	Order No.
Power Supply	
Terminal Power Strip, Surge Withstand, 100 Vac to 240 Vac, 100 to 350 Vdc	A01/B01
Terminal Power Strip, Surge Withstand, 2 to 48 Vdc	A02/B02
Holdover Oscillator	
Rubidium, 1 µs/24 h	C01
Network Connectors	
3 - 10/100BT	D01
2 - 10/100BT, 1 - Multimode Fiber	D02
1 - 10/100BT, 2 - Multimode Fiber	D03
3 - Multimode Fiber	D04
Auxiliary I/O	
Programmable Pulse Outputs, 50 Ohm	E01/F01/G01
Programmable Pulse Outputs, 75 Ohm	E02/F02/G02
1.544/2.048 MHz, 50 Ohm ,DC Coupled	E03/F03/G03
1.544/2.048 MHz, 75 Ohm DC Coupled	E04/F04/G04
1.544/2.048 MHz, 50 Ohm, AC Coupled	E05/F05/G05
1.544/2.048 MHz, 75 Ohm, AC Coupled	E06/F06/G06
Modulated IRIG-B Outputs	E07/F07/G07
Programmable Pulse Fiber-Optic Outputs	E08/F08/G08
Programmable Pulse 24V Outputs	E09/F09/G09
Dual Relays	E10/F10/G10
System 1PPS Output, 50 Ohm	E11/F11/G11
System 1PPS Output, 75 Ohm	E12/F12/G12
Redundant GNSS receiver	E13
Frequency, 50 Ohm DC Coupled	E14/F14/G14
Frequency, 75 Ohm DC Coupled	E15/F15/G15
Frequency, 50 Ohm AC Coupled	E16/F16/G16
Frequency, 75 Ohm AC Coupled	E17/F17/G17
1 MHz Sine Wave Outputs	E18/F18/G18
5 MHz Sine Wave Outputs	E19/F19/G19
10 MHz Sine Wave Outputs	E20/F20/G20

[1] RoHS compliant

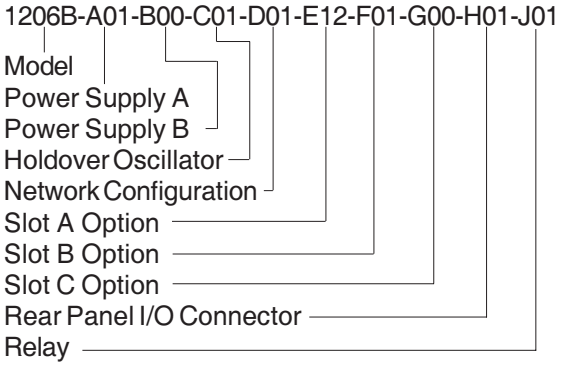
Options (Continued)

Rear Panel Connector	
None	H00
Screw Terminals	H01
Crimp Terminals	H02
Relay	
Standard Voltage (30 Vdc/250 Vac)	J01
High DC-Voltage (300 Vdc/250 Vac)	J02

Accessories

Description	Order No.
Included	
GNSS Antenna, pipe mountable	AS0099200
15 m (50 ft) RG-6 Antenna Cable[1]	CA0021315
Rack Mounts	AS0094800
Quick Setup Guide	PD0053000
Available	
Operation Manual	AS0100300
Antenna Mounting Kit	AS0044600
15 m (50 ft) RG-6 Antenna Cable[1]	CA0021315
30 m (100 ft) RG-6 Antenna Cable[1]	CA0021330
45 m (150 ft) RG-6 Antenna Cable[1]	CA0021345
60 m (200 ft) RG-6 Antenna Cable[1]	CA0021360
75 m (250 ft) RG-6 Antenna Cable[1]	CA0021375
21 dB In-Line Preamplifier for cable lengths greater than 100 m	AS0044700
GNNS Surge Arrester	AS0094500
Antenna Grounding Block Kit	AS0048900
BNC (Male) Breakout to 100 mm Wires	AP0003400
BNC (Female) Breakout to 100 mm Wires	AP0008900

Order Guide



Arbiter Systems, Inc. · 1324 Vendels Circle, Suite 121 · Paso Robles, CA 93446 · USA
Tel: +1.805.237.3831 · Fax: +1.805.238.5717 · E-mail: sales@arbiter.com · Internet: http://www.arbiter.com