Model 1095A/C
Industrial GPS Clock

The Arbiter Systems®, Inc. Model 1095A/C Industrial GPS Clock is a GPS timing source for industrial applications that require common timing signals, such as IRIG-B, 1 PPS, and RS-232 serial time codes, in a small, rugged enclosure suitable for indoor and outdoor applications. The Model 1095A/C with 250 ns (typical < 100 ns) worst-case accuracy meets the most demanding requirements including synchrophasors. The Model 1095C has a see-through cover with 4 LEDs to monitor operating status and a large 7-segment LED time display. The Model 1095A has an opaque cover. The 1095A/C comes standard with a built-in GPS antenna or can be configured with an optional external antenna.

Four outputs, with terminal strip connectors, provide three high-drive 5 Vdc (250 mA at > 4 V) outputs: IRIG-B00x level-shift, programmable pulse A and programmable pulse B, and one 4.5 Vpp modulated IRIG-B (IRIG-B12x) signals. All of the outputs have substantial drive capability to easily drive multiple loads in parallel. Two serial (RS-232) ports can be used for setup, or for serial time codes such as IRIG-J. An RS-485 port (transmit only) is also included.

Standard features include a GPS Data Backup Battery, one Form C fail-safe relay, and Event Capture capability. The GPS Data Backup Battery maintains the real-time clock, almanac and ephemeris data in the 12-channel GPS receiver to speed acquisition. Satellites are acquired in as little as 15 seconds after a brief power loss. One Form C (SPDT) fail-safe relay is selectable to Fault, Unlocked, or Programmable Pulse functions and is compatible with digital fault recorder inputs. The Event Capture records events triggered from the dedicated, optically-isolated input or from either serial port receive line with 100 ns resolution.

The Model 1095A/C accepts nominal 12 Vdc or 24 Vdc (9 Vdc to 30 Vdc) power from battery or other power sources.

Specifications subject to change without notice.
Model 1095A/C Specifications

### Receiver Characteristics

#### Timing Accuracy
Specifications apply at the 1 PPS, IRIG-B Level-Shift and Programmable Pulse outputs, with US Department of Defense Selective Availability (SA) as of date of publication. UTC/USNO: ± 250 ns peak; < ± 100 ns typical (SA off)

#### Position Accuracy
10 meters, rms, 90% confidence

#### Satellite Tracking
12 channel, C/A code (1575.42 MHz). Receiver simultaneously tracks up to twelve satellites.

#### 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

### I/O Configuration

#### Outputs
Four Total: three high-drive 5 Vdc (250 mA at > 4 V), one analog (4.5 Vpp), terminal strip connectors.
- Output 1: Programmable Pulse A
- Output 2: IRIG-B00x level-shift
- Output 3: Programmable Pulse B
- Output 4: Modulated IRIG-B

#### Event Input
One opto-isolated event capture input with 100 ns resolution, terminal strip inputs for 5 Vdc to 12 Vdc, 24 Vdc to 48 Vdc, and 120 Vdc to 240 Vdc nominal input.

#### Relay Contact
One, Form C (SPDT) fail-safe, 0.3 A at 130 Vdc; jumper selectable to Fault, Out-of-Lock, Programmable Pulse A (PPA), Programmable Pulse B (PPB), Stabilized, and Event-In functions.

Fail-safe means the relay indicates ‘fault’ or ‘unlocked’ condition with power off.

### I/O Configuration (cont.)

#### Programmable Pulse Output
Two programmable pulse outputs (5 Vdc), PPA and PPB.
- Modes:
  - 1 PPS
  - Every 1 second to 60,000 seconds
  - Hourly at a specified offset
  - Daily at a specified time of day
  - One shot at a specified time of year
  - 1 PPS to 1000 PPS squarewave (PPB only)
  - Aux IRIG Mode (PPB only)

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. Aux IRIG Mode provides an additional unmodulated IRIG-B signal on the PPB output

### Interface

#### Operator
- 1095C Display: 6-digit LED Time of Day (20 mm)
- Status LEDs: Operate (green), Stabilized (green), Unlocked (red), Fault (red)

#### Setup (via remote interface)
- Local time offset
- IRIG Setup: Local/UTC/IEEE 1344
- Daylight Saving Time
- LED Brightness control
- Event input: Event/1 PPS Deviation
- Programmable Pulse Setup
- Antenna Cable Delay
- Out-of-Lock Time
- Auto-Survey
- Relay Control
- RS-485 Output
- Serial port 2 (RS-232)
- Serial port 1 (RS-232): DIP Switches
## Interface (cont)

**System**
- RS-232: 1200 baud to 115200 baud; 7 or 8 data bits; 1 or 2 stop bits; even/odd/no parity (TXD, RXD, COM)
- Broadcast modes include: ASCII, Extended ASCII, ASCII with Time Quality, and Vorne (output once every second), Status (output on change of Status) and Custom Configurable Serial Time Code
- RS-422/485: Transmit only, to drive multiple devices. Available Signals include: Serial Port 1, Serial Port 2, IRIG-B, PPA, PPB, and 1 PPS.

## Power Requirements

**Standard**
- Voltage: 9 Vdc to 30 Vdc, 3 W max.; negative common
- 3.81 mm pluggable terminal strip

## General

**Physical**
- Size: 180 mm x 120 mm x 60 mm (7.1 in x 4.7 in x 2.4 in) plus cable gland
- Weight: 1 kg (2.2 lbs), net
- 2 kg (4.4 lbs), shipping
- Mounting: 4 mounting feet included
- Antenna: Built-in or optional external
- Sealing Cable Port: Accepts up to a 16 conductor cable with an OD from 6 mm to 12 mm (0.24 in to 0.47 in)
- Degree of Protection: IP65 (IEC 60529)

**Environmental**
- Operating Temperature: -40 °C to +85 °C
- EMC: Radiated susceptibility: passes walkie-talkie test

## Certifications and Approvals
- CE mark/label and certificate

## Options

**Description** | **Order No.**
--- | ---
External Antenna | 1095Aopt01, 1095Copt01

Internal antenna is removed when the external antenna option is ordered.

## Accessories

### Included

**Description** | **Order No.**
--- | ---
Quick Setup Guide | PD0052900
Sealing Cable Port: Accepts cable OD from 6 mm to 12 mm (0.24 in to 0.47 in) | HP0022601

### Available

**Description** | **Order No.**
--- | ---
Operation Manual | AS0096400
Programming Port Cable | AS0067200
DIN Rail Mounting Assembly | AS0093700
GPS Antenna, pipe mountable | AS0087800
GPS Antenna Mounting Kit | AS0044600
2 m (6 ft) RG-6 Antenna Cable | CA0021302
6 m (20 ft) RG-6 Antenna Cable | CA0021306
15 m (50 ft) RG-6 Antenna Cable | CA0021315
30 m (100 ft) RG-6 Antenna Cable | CA0021330
Antenna Grounding Block Kit | AS0048900
GPS Surge Protector | AS0094500
Sealing Cable Port: Accepts cable OD from 5 mm to 9 mm (0.20 in to 0.35 in) | HP0022602

---

1 For use with external antenna. Longer cable lengths are available.
2 Modular DB9 to RJ11 Adapter and RJ11 Cable 7 ft.
3 Included with 1095Aopt01 and 1095Copt01