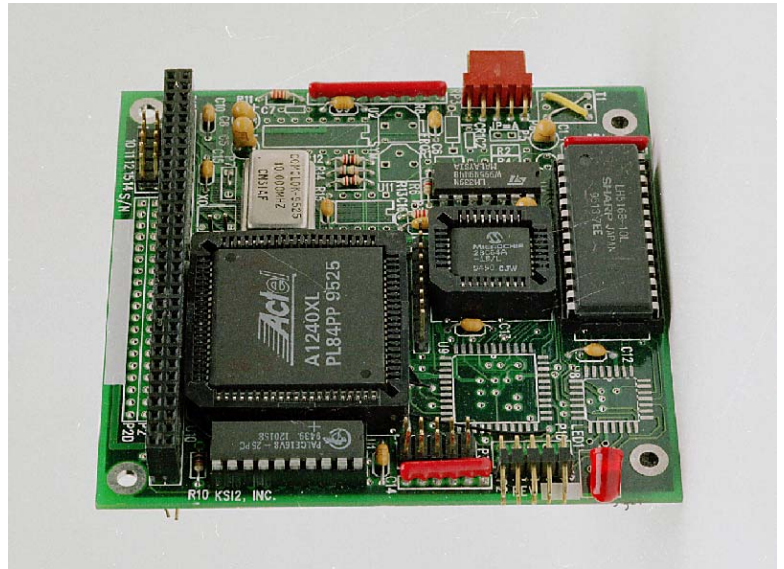


PC104-SG

- Single PC/104 module
- IRIG A, B, NASA 36, 1 PPS sync inputs
- GPS synchronization option
- Have Quick sync input option
- Propagation delay correction
- Zero latency time reads
- Match Time output
- IRIG-B DC time code output
- External Event time tag input
- Three user programmable pulse rates



The PC104-SG from Brandywine Communications provides precision time with zero latency to the host computer over the PC/104 bus. An on-board microprocessor automatically synchronizes the clock on the PC104-SG to reference signal inputs. The clock can free run and be preset by commands from the host over the PC/104 bus.

The on-board clock accepts IRIG A, IRIG B, or NASA 36 synchronization inputs and user input signal delay compensation information. GPS and Have Quick sync inputs are optionally available. An IRIG B DC shift code generator is included as a standard feature.

The advanced microprocessor on the PC104-SG module constantly measures the time error between the on-board clock and the reference input code and adjusts the error measurement for propagation delay. In units supplied with the disciplined TCXO oscillator option the residual error is used in an adaptive gain loop to adjust the frequency of the 10 MHz oscillator for minimum error. If the incoming time code is missing or corrupted by noise the on-board clock is updated using the disciplined 10 MHz oscillator. When the input code is again useable the correction loop is smoothly closed.

BCD time data is available to the host computer using zero latency time reads. The time message contains units of microseconds through tens of years. A status word is available using an additional read.

The time-of-occurrence of random, external events may be captured (time-tagged) by using the Event Time input. When the event input is sensed the current time is saved in a buffer

for later interrogation by the host. The resolution of the time tag is 100 nanoseconds.

Internal or external processes may be automatically initiated or terminated by using the Match Time feature. This feature asserts an output when the user input start time matches the time in the internal clock. The output is terminated under user control or when the pre-programmed stop time is encountered. The resolution of the Match Time comparison is one microsecond.

Three user programmable pulse rates are provided. These pulse rates, Clock Low, Clock High and Heartbeat, are output at the multi-pin connector. The divider for each of the three rate generators is programmable by the host over the range 2–65,535. The inputs to the rate generators are 3 MHz for the Heartbeat and Clock High and 100 Hz for Clock Low. The Heartbeat is also available as an interrupt.

The GPS synchronization option adds worldwide time transfer capability that can be traced to the U.S. Government standard UTC-USNO. Very precise synchronization, automatic leap year and leap second correction, and accurate position information are additional benefits provided by the GPS option.

To facilitate software development, C language sample programs are supplied with the PC104-SG.

In addition to the impressive set of standard capabilities offered by the PC104-SG, a wide range of optional features may be specified. These options allow the user to customize the PC104-SG to fit almost any application.

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PC104-SG Specifications

General Input Specifications

| | |
|--------------------|-------------------------------------|
| Input Codes | IRIG's A and B, NASA 36 |
| Input Amplitude | .25 Vpp to 10 Vpp |
| Input Impedance | >10k Ohms |
| Ratio | 2:1 to 4:1 |
| Frequency Error | 100 PPM maximum |
| Code Sync Accuracy | One microsecond |
| 1PPS input | TTL, positive edge |
| 1PPS Sync Accuracy | One microsecond |
| External Event | TTL, positive edge, PW 20nS minimum |
| Resolution | 100 nanoseconds–Hundreds of days* |
| Min. event spacing | None in interrupt mode |

General Output Specifications

| | |
|----------------------|--|
| IRIG B DC Shift | TTL |
| Match Pulse | TTL level at Start–Stop time |
| Resolution | Microseconds–eight milliseconds |
| Clock Low | TTL, negative going |
| Clock Divisor | 2–65,535 |
| Clock Input | 100 PPS |
| Default Output | 1 PPS |
| Clock High | TTL, negative going |
| Clock Divisor | 2–65,535 |
| Clock Input | 3 MPPS |
| Default Output | 76.923k PPS |
| Heartbeat Rate | Interrupt and flag |
| | TTL, negative going |
| Clock Divisor | 2–65,535 |
| Clock Input | 3 MPPS |
| Default Output | 10k PPS |
| BCD Time | Microseconds–Days* on demand, No latency, 58 bits in nine 8 bit words |
| Status LED | Flashes coded patterns |
| Interrupts | External Event, Heartbeat, Match Time |
| Status Word Flags | FIFO Data Ready, In Sync, Heartbeat, Match Time, External Event, Three Interrupt Enables |
| Connectors | |
| Reference Inputs | 5 Pin right angle |
| TTL Inputs & Outputs | 10 Pin right angle |
| Bus | Per PC/104 specification |

* Years input by user

Mechanical & Environmental

| | |
|-----------------------|-----------------------------|
| Size | 3.550" X 3.775" (PC/104) |
| Power | |
| +5 Vdc | ±5%, 150 mA maximum |
| +12 Vdc | ±5%, 100 mA maximum |
| -12 Vdc | ±5%, 50 mA maximum |
| Operating Temperature | 0°C to +55°C |
| Storage Temperature | -40°C to +85°C |
| Humidity | To 95% without condensation |

Options

| | |
|-------------------------------|----------------------------------|
| GPS Synchronization Input | Request SatPak104-LPD data sheet |
| IRIG B Modulated Output | 2.5 Vpp into 600 Ohms |
| Input Code Isolation | Transformer coupling |
| Input Codes | IRIG G, XR3, 2137, IRIG E |
| Output Codes | IRIG A, NASA 36 |
| Add Two External Event Inputs | TTL, positive edge |
| Extended Temperature Range | -40°C to +85°C |
| Have Quick Output | Per ICD-GPS-060 |
| Have Quick Input | Per ICD-GPS-060 |
| 1PPS Sync Input | +10 Vdc, 50 Ohms |
| Oscillator Upgrades | Disciplined TCXO, 1 PPM |
| Video Character Inserter | |
| Time in Binary format | |

Other Brandywine Communications Products

- Video Character Inserters
- Time-Message Displays
- PCI, PMC, VME, CPCI and ISA Computer Clock Synchronization Boards
- Network Time Servers
- Frequency Generation and Distribution Instruments
- Dual & Triple Redundant Systems

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