IP320A
12-Bit A/D, Analog Input

The IP320A monitors 20 differential or 40 single-ended input channels. When used with a carrier that holds four IP modules, up to 160 inputs can be obtained from a single card cage slot.

A jumper offers a choice of three input voltage ranges. Using the software programmable gain, you can easily customize the input voltage on an individual channel basis. The control register provides further flexibility with the option of single-ended or differential inputs and controlled channel selection. Software or external triggers enable synchronization of data acquisition to external events.

Features
- 20 differential or 40 single-ended inputs
- 12-bit, successive approximation A/D converter (ADC) with an 4.5μS conversion time
- 200K samples per second maximum system throughput rate
- Three dip switch-selectable input ranges: -5 to 5V, -10 to 10V, and 0 to 10V
- Programmable gains of 1, 2, 4, and 8
- Built-in calibration references

Benefits
- Software or external hardware inputs can trigger A/D conversions for synchronization to external events.
- On-board, precision voltage references enable accurate software calibration of the module without external instruments.
- The module supports both "wait" states (generated by the IP module) and "hold" states (generated by the carrier board).

Specifications

Analog Inputs
Input configuration: 40 single-ended or 20 differential.
A/D resolution: 12 bits.
Input ranges (dip switch-selectable):
  Bipolar -5 to +5V, -10 to +10V (See Note 1), or
  Unipolar 0 to +10V (See Note 1).
Note 1: Range requires ±15V external power supply. Clipping occurs with ±12V supplies, typically to ±9V.
Maximum throughput rate: 200KHz (5μS/conversion).
  Only one channel updates at a time.
  Programmable gains: x1, x2, x4, x8.
A/D triggers: External and software.
Maximum overall calibrated error at 25°C. See below.
<table>
<thead>
<tr>
<th>Input Range (volts)</th>
<th>PGA Gain</th>
<th>ADC Range (volts)</th>
<th>Max Error ±LSB (%span)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 10</td>
<td>1</td>
<td>0 to 10</td>
<td>3.2 (0.078)</td>
</tr>
<tr>
<td>-5 to +5</td>
<td>1</td>
<td>-5 to +5</td>
<td>1.8 (0.044)</td>
</tr>
<tr>
<td>-10 to +10</td>
<td>1</td>
<td>-10 to +10</td>
<td>2.8 (0.069)</td>
</tr>
</tbody>
</table>

Data format (left-justified): Straight Binary.
Input overvoltage protection: ±32V powered,
  -35 to +55 unpowered.
Common mode rejection ratio (60Hz): 71dB.
Channel-to-channel rejection ratio (60Hz): 71dB.

IP Compliance (ANSI/VITA 4)
Meets IP specifications per ANSI/VITA 4-1995.
IP data transfer cycle types supported:
  Input/output (10S5e*), ID read (10S5e*).
Access Times (8MHz clock):
  All functions: 0 wait states (250ns cycle) except
  Control register write: 1 wait state (375ns cycle),
  Read ADC data: 2 wait states (500ns cycle).
Conversion Request (write): 1 wait state (375ns cycle)

Environmental
Operating temperature: 0 to 70°C (IP320A)
  or -40 to 85°C (IP320AE model).
Storage temperature: -40 to 125°C (IP320A)
  or -55 to 105°C (IP320AE model).
Relative humidity: 5 to 95% non-condensing
MTBF: 719,999 hrs at 25°C, MIL-HDBK-217F, Notice 2
Power: +5V: 210mA maximum,
  +12V from P1 or +15V from P2: 25mA maximum.
  -12V from P1 or -15V from P2: 25mA maximum.

Ordering Information

Industry Pack Modules
IP320A
  40 single-ended or 20 differential inputs.
IP320AE
  Same as IP320A plus extended temperature range.
Acromag offers a wide selection of Industry Pack Carrier Cards.

Software (see software documentation for details)
IPSW-API-VXW
  VxWorks® software support package
IPSW-API-QNX
  QNX® software support package
IPSW-API-WIN
  Windows® DLL driver software support package
IPSW-LINUX
  Linux™ support (website download only)
See accessories documentation for additional information.