# SPECIFICATIONS

# CIO-DAS1401/12
# CIO-DAS1402/12
# CIO-DAS1402/16

Analog Input & Digital I/O


Revision 7, November, 2000

# CIO-DAS1401/12 and CIO-DAS1402/12

## Analog Input Section

| | |
|---|---|
| A/D converter type | ADS7800 successive-approximation |
| Resolution | 12 bits (1 in 4096) |
| Programmable ranges | |
| CIO-DAS1401/12 | ±10V, ±1V, ±0.1V, ±0.01V, 0 to 10V, 0 to 1V, 0 to 0.1V, 0 to 0.01V |
| CIO-DAS1402/12 | ±10V, ±5V, ±2.5V, ±1.25V, 0 to 10V, 0 to 5V, 0 to 2.5V, 0 to 1.25V |
| A/D pacing | Programmable: external source (Din0, positive edge) or internal counter (positive or negative edge, jumper selectable) or software polled |
| Burstmode | 4 µs |
| Data transfer | From 512 sample FIFO via interrupt, DMA or software-polled |
| Polarity | Unipolar/Bipolar, switch-selectable |
| Number of channels | 8 differential or 16 single-ended, switch-selectable |
| Interrupts | 2 to 7 |
| Interrupt enable | Programmable |
| Interrupt sources | End-of-conversion, terminal count (DMA) |
| DMA | Channel 1 or 3 |
| Trigger sources | External hardware/software (DIn0) |
| | |
| A/D conversion time | 3.3 µs |
| Throughput | 160 kHz |
| Differential Linearity error | ±1 LSB |
| Integral Linearity error | ±1 LSB |
| No missing codes guaranteed | 12 bits |
| Gain drift (A/D specs) | ±30 ppm/°C |
| Zero drift (A/D specs) | ±10 ppm/°C |
| | |
| Input leakage current | 250 nA max |
| Input impedance | 10 MegOhms min |
| Absolute maximum input voltage | ±35V |

## Digital Input / Output

| | |
|---|---|
| Digital Type | |
| Output | 74LS197 |
| Input | 74LS244 |
| Configuration | 4 fixed inputs, 4 fixed outputs |
| | |
| Number of channels | 8 |
| Output High | 2.7 volts min @ -0.4mA |
| Output Low | 0.5 volts max @ 8mA |
| Input High | 2.0 volts min, 7 volts absolute max |
| Input Low | 0.8 volts max, -0.5 volts absolute min |

## Counter Section

| | |
|---|---|
| Counter type | 82C54 |
| Configuration | 3 down-counters, 16 bits each |

Counter 0 - Independent, user configurable

| | |
|---|---|
| Source: | Programmable - Internal 100kHz or external (CTR0 Clock In) |
| Gate: | External (DIn2) |
| Output: | Available at user connector (CTR0 Out) |

Counter 1 - ADC Pacer Lower Divider

| | |
|---|---|
| Source: | 1 or 10 MHz oscillator (jumper selectable) |
| Gate: | Tied to Counter 2 gate, programmable source. |
| Output: Chained to Counter 2 Clock. | |

Counter 2 - ADC Pacer Upper Divider

| | |
|---|---|
| Source: | Counter 1 Output. |
| Gate: | Tied to Counter 1 gate, programmable source. |
| Output: | ADC Pacer clock, hard-wired to user connector, Ctr2 out |

| | |
|---|---|
| Clock input frequency | 10 Mhz max |
| High pulse width (clock input) | 30 ns min |
| Low pulse width (clock input) | 50 ns min |
| Gate width high | 50 ns min |
| Gate width low | 50 ns min |
| Input low voltage | 0.8V max |
| Input high voltage | 2.0V min |
| Output low voltage | 0.4V max |
| Output high voltage | 3.0V min |

## Environmental

| | |
|---|---|
| Operating temperature range | 0 to 50°C |
| Storage temperature range | -20 to 70°C |
| Humidity | 0 to 90% non-condensing |

## Power Consumption

+5 1.4A typical, 2.1A max

# CIO-DAS1402/16

## Analog Input Section

| | |
|---|---|
| A/D converter type | ADS7805 successive approximation |
| Resolution | 16 bits (1 in 65,536) |
| Programmable ranges | ±10V, ±5V, ±2.5V, ±1.25V, 0 to 10V, 0 to 5V, 0 to 2.5V, 0 to 1.25V |
| A/D pacing | Programmable: external source (Din0, positive edge) or internal counter (positive or negative edge, jumper-selectable) or software-polled |
| Burstmode | 13.3 µs |
| Data transfer | From 512 sample FIFO via interrupt, DMA, or software-polled |
| Polarity | Unipolar/Bipolar, switch-selectable |

| | |
|---|---|
| Number of channels | 8 differential or 16 single-ended, switch-selectable |
| Interrupts | 2 to 7 |
| Interrupt enable | Programmable |
| Interrupt sources | End-of-conversion, terminal count (DMA) |
| DMA | Channel 1 or 3 |
| Trigger sources | External hardware/software (DIn0) |
| | |
| A/D conversion time | 10 µs |
| Throughput | 100 kHz |
| | |
| Absolute Accuracy | Adjustable to ±0.0015% of FS |
| Differential Linearity error (Bipolar) | ±1 LSB |
| Integral Linearity error (Bipolar) | ±1.5 LSB |
| No missing codes guaranteed | 16 bits |
| Gain drift (A/D specs) | ±7 ppm/°C |
| Zero drift (A/D specs) | ±2 ppm/°C |
| | |
| Input leakage current | 250 nA max |
| Input impedance | 10 MegOhms min |
| Absolute maximum input voltage | ±35V |

## Digital Input / Output

| | |
|---|---|
| Digital Type | |
| Output | 74LS197 |
| Input | 74LS244 |
| Configuration | 4 fixed input, 4 fixed output |
| | |
| Number of channels | 8 |
| Output High | 2.7 volts @ -0.4 mA min |
| Output Low | 0.5 volts @ 8 mA max |
| Input High | 2.0 volts min, 7 volts absolute max |
| Input Low | 0.8 volts max, -0.5 volts absolute min |

## Counter Section

| | |
|---|---|
| Counter type | 82C54 |
| Configuration | 3 down counters, 16 bits each |
| | |
| Counter 0 - Independent, user configurable | |
| Source: | Programmable - Internal 100 kHz or external (CTR0 Clock In) |
| Gate: | External (DIn2) |
| Output: | Available at user connector (CTR0 Out) |
| | |
| Counter 1 - ADC Pacer Lower Divider | |
| Source: | 1 or 10 MHz oscillator (jumper-selectable) |
| Gate: | Tied to Counter 2 gate, programmable source. |
| Output: | Chained to Counter 2 Clock. |
| | |
| Counter 2 - ADC Pacer Upper Divider | |
| Source: | Counter 1 Output. |
| Gate: | Tied to Counter 1 gate, programmable source. |
| Output: | ADC Pacer clock, hard-wired to user connector, Ctr2 out. |
| | |
| Clock input frequency | 10 MHz max |
| High pulse width (clock input) | 30 ns min |

| | |
|---|---|
| Low pulse width (clock input) | 50 ns min |
| Gate width high | 50 ns min |
| Gate width low | 50 ns min |
| Input low voltage | 0.8V max |
| Input high voltage | 2.0V min |
| Output low voltage | 0.4V max |
| Output high voltage | 3.0V min |

## Power Consumption

| | |
|---|---|
| +5V | 1.4A typical, 2.1A max |

## Environmental

| | |
|---|---|
| Operating temperature range | 0 to 50°C |
| Storage temperature range | -20 to 70°C |
| Humidity | 0 to 90% non-condensing |

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