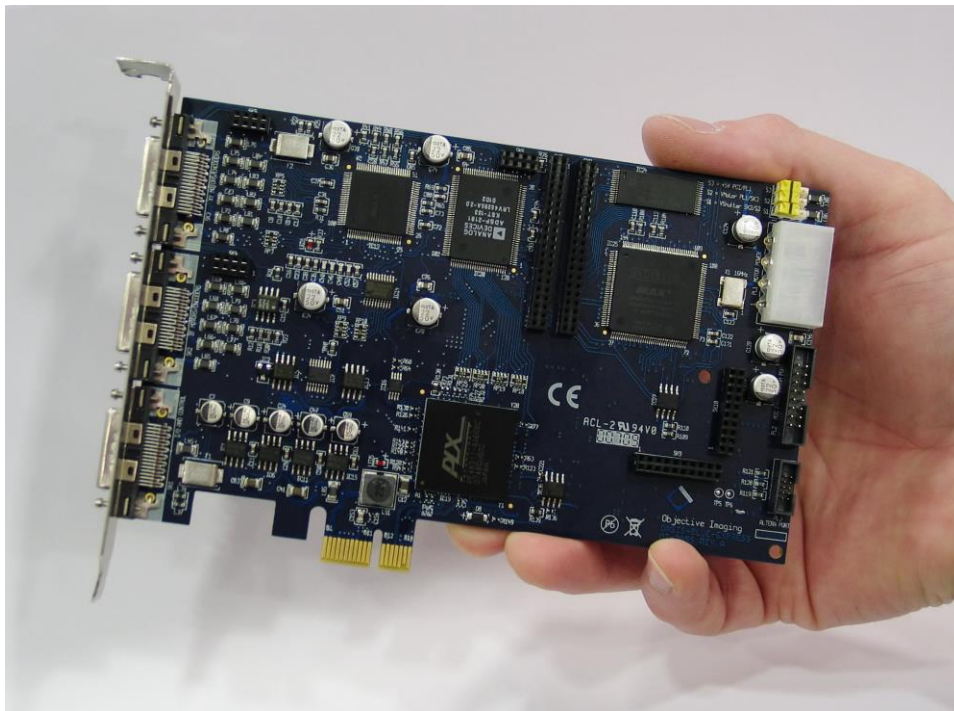


OASIS blue

Compact Motion Control Card

Delivering high performance and advanced functionality in a compact package, the OASIS-blue-express universal PCI-E motion controller establishes the standard for automation in microscopy and imaging.

The OASIS-blue-express 4 axis precision stepper motor controller with on-board drivers offers a single-slot solution for motorized XY stages, Z focus drives, filter wheels, and shutters. Smaller than a standard PCI short card, the compact, elegant design and universal PCI-E form factor of the OASIS-blue-express enhance compatibility over a wide range of PC enclosures, providing maximum automation performance with the minimum footprint. The OASIS-blue-express is complemented by an extensive library of motion control functions and software utilities.



Highlights

- ◇ Versatile 4 axis precision microstepping controller
- ◇ Ultra-compact design for maximum compatibility
- ◇ On-board drivers for complete solution
- ◇ Motor drive power through internal +12 V PC supply or external power to +40 V
- ◇ Compatible with a wide range of 3rd party XY stages, Z focus motors, filter wheels, and shutters
- ◇ Universal PCI 2.2 compliant for 3.3 V and 5 V busses
- ◇ On-board dual shutter controllers
- ◇ Powerful DSP processor for optimal performance
- ◇ Read/write flash memory for secure configuration settings
- ◇ Critical safety features for thermal and current protection
- ◇ General purpose TTL input and output channels
- ◇ Optional daughter modules for encoder support, camera trigger synchronization, and advanced functions
- ◇ Extensive library of motion control software

OASIS blue Specifications

Stepper Performance

| | |
|---------------------------------------|--|
| Axes | 4 (Independently controlled) |
| Microstep resolution | Software selectable from 400 steps/rev. to 51,200 steps/rev. with 1.8° Motor |
| Maximum speed | 960 KHz (microsteps/s), 7.5KHz (half-steps/s) |
| Minimum speed | 32Hz (micro-steps/s), 0.0078125Hz (half-steps/s) |
| Maximum peak motor current | 0.0A to 1.50A/phase in 6mA steps |
| Standby motor current | 0.0A to 1.50A/phase in 6mA steps |
| Standby motor current switchover time | 0 to 2097 seconds in 32mS steps |
| Maximum motor supply voltage | +34V (typically +12V) |
| Minimum motor supply voltage | +10V |
| Command overhead (Move XYZ) | <10 µs |
| Controller response time (Move XYZ) | <20 µs |
| Acceleration/deceleration profiles | 4 preset user-definable tables (512 values per table) |
| Position counter resolution | 32 bits |
| Maximum move size | From 1 to 2 ³¹ microsteps – user-definable |

General

| | |
|---------------------------|--|
| Processor (DSP) | Analog Devices ADSP-2181 |
| Processor clock frequency | 32 MHz |
| Non-volatile memory | 4-Mbit flash for programme and user configuration storage |
| Reset method | Hardware watchdog, software, (PC reset selectable as required) |
| Switch-on time | <1 s - fully functional |

Bus Interface

| | |
|---------------------|---|
| Type | PCI Express – conforms to PCI Express specification r1.0a |
| Bus-type | Single-lane, based on PLX PEX-8311 |
| Operating frequency | To 66 MHz |

System Safety

| | |
|-----------------------------------|--|
| Watchdog timer function | Resets board on processor fail or dip in +5V |
| Watchdog timeout period | 1.6s |
| Drive current limit | 4A max. per motor |
| Drive current limit response time | 4ms (typical) |
| Thermal shutdown | Yes – motor driver IC's in hardware or in software at user-definable temperature |
| Temperature monitor | Yes – monitors driver IC's heatsink plane |
| Drive voltage monitor | Yes – 0 to 50V |
| Hardware limit switch inputs | 2 per axis. User definable N/O or N/C |
| Software limits | User-definable, any range within 2 ³¹ microsteps |
| Software | Stop individual or all axes command |
| Hardware | Opto-isolated input may be used to shutdown motor drive current |

I/O

| | |
|-------------------------|---|
| Encoder inputs | 4 total (1 per axis). Phase-quadrature TTL or RS422 (needs BLUE-EXPIO module) |
| Home inputs | 4 total (1 per axis). TTL compatible with 1K pull-up to 5V |
| General purpose I/O | 4 TTL compatible input/output lines |
| General purpose inputs | 2 opto-isolated inputs, can generate interrupts to DSP |
| General purpose outputs | 2 TTL compatible output lines |

| | |
|----------------------------|---|
| Dedicated inputs | 7 TTL compatible with 10K pull-ups to 5V, for input device buttons and switches. Can generate interrupts to DSP |
| Synchronous serial port | Direct to DSP for further I/O expansion, e.g. connection to OI-Touch-K joystick |
| Shutter control | 2 shutter outputs for Uniblitz 25mm-35mm shutters |
| +12V output | Via 36-way I/O connector (resettable fuse protected 1.1A) |
| +5V output | Via 36-way X/Y, Z/F and I/O connectors (current limited to 500mA) |
| Analog port | 2 x 8-bit A/D (joystick interface) |
| Phase-quadrature inputs | 3 (for X, Y and Z axis control, digi-knob or trackball etc.) |
| Composite video input | 1 x 75R terminated (provides autofocus capability with optional BLUE-DAC module) |
| Composite video O/P | 1 x (buffered video in, 75R drive – optional BLUE-DAC module required) |
| 10-34V motor power input | Input on XY 36-way Champ connector (SK3) |
| 12-24V shutter power input | Input on ZF 36-way Champ connector (SK2) |

Power Requirements (maximum)

| | |
|-------------------------|--|
| +3.3 V (±5%) | 2.75 A (via PCI connector) |
| +12 V (±5%) | 150 mA (via PCI connector) |
| 10-34V (motor supply) | 4.0A max. 1.0 – 1.5A typical, supplied by PC or external PSU |
| 12-24V (shutter supply) | 2.0A x number of shutters driven simultaneously, current is only needed for 20mS from external PSU, but may use PC +12V via PL1, with longer opening times |

Connectors

| | |
|---------------------------------------|---|
| X/Y drives & encoders | 36-way Champ connector (SK3) with spring latch on front plate |
| Z/F drives & encoders | 36-way Champ connector (SK2) with spring latch on front plate |
| I/O joystick, digi-knobs, TTL I/O etc | 36-way Champ connector (SK1) with spring latch on front plate |
| PL1 – motor power | 4-way male disk-drive power connector (normally connected to PC power supply) |
| PL2 – I/O passthrough | 16-way 2mm pitch IDC connector for passthrough of I/O signals |
| SK4, 5, 6, 7 | 2mm pitch connectors for mating with the encoder module |
| SK8, 9, 10 | 2mm pitch connectors for mating with the expansion module |

Physical Dimensions & Weight

| | |
|--------|---|
| Size | 152mm x 97mm (6" x 3.8") not including connectors |
| Weight | 105g (3.7oz) |

Environment

| | |
|-------------------------|---------------------------|
| Operating temperature | 0 to 35°C (ambient) |
| Storage temperature | 0 to 70°C |
| Relative humidity range | 10 to 90% (noncondensing) |

Regulatory Approvals

| | |
|--------|----------------------|
| C.E. | EN61326:1997 Class B |
| F.C.C. | CFR 47:2004 Class A |



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