

ZMP-SynqNet Series Motion Controllers

Hardware Specification



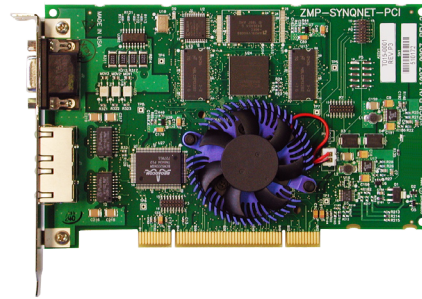
Helping you build a better machine, faster.

ZMP-SynqNet Series

Hardware Specification



SynqNet®



Key Benefits

- Increased Throughput**
 Shared memory map architecture results in minimized controller latency for the fastest possible motion response and maximized machine throughput. On-the-fly motion and gain set modifications improve machine throughput by minimizing cycle and settling times.
- Increased Reliability**
 Optional CPCI-3U form factor for high-vibration environments enhances machine quality, reliability, and up-time.
- Reduced System Costs**
 Real-time operating system support reduces overall system cost by enabling deterministic usage of host processor for optimized machine design.
- Reduced Development Costs**
 Tight coordination between motion and I/O via the SynqNet network reduces machine development costs by providing real-time system visibility and motion optimization.

Ultra-Performance SynqNet Motion Controller

The ZMP-SynqNet Series controllers provide machine builders with the ultimate in high-performance motion control. The 64-bit ZMP controllers utilize a 466MHz MPC8245 PowerPC processor for optimum flexibility and speed. With a significant increase in processing power, the ZMP family of controllers are optimized to work with MechaWare™ for the ultimate in precision control schemes. Available in PCI and CPCI-3U form factors.

The ZMP-SynqNet Series controllers offer servo update rates up to 48kHz, allowing optimum control of machines requiring high levels of coordination and synchronization between axes.

Develop motion applications for the ZMP family of controllers with either the MPI programming library for C/C++ or the MPX programming library for Visual Basic .NET and C#.

Decrease development costs with our MechaWare software tool by implementing your machine knowledge on the controller without custom control hardware or firmware.

SynqNet Platform Overview

Launched in 2001, SynqNet is a digital machine control network specifically designed to meet the flexibility, performance, and safety requirements of today's demanding machine control applications. Built on the 100BT physical layer, SynqNet provides a synchronous real-time connection between motion controllers, servo drives, stepper drives, I/O modules, and custom devices.

FAST

- Network bandwidth for servo updates up to 48 kHz
- Supports up to 32 nodes with 32 axes*
- Over 16,000 bits of digital I/O and 1,000 points of analog I/O
- Real-time diagnostics over SynqNet

SAFE

- "Self-Healing" fault tolerant operation using ring topology
- "HotReplace" allowing replacement of node without network shutdown

PROVEN

- Over 350,000 motion axes installed worldwide
- Multi-vendor interoperable network

SynqNet®
www.synqnet.org



Motion
Controllers



Drives and
Motors

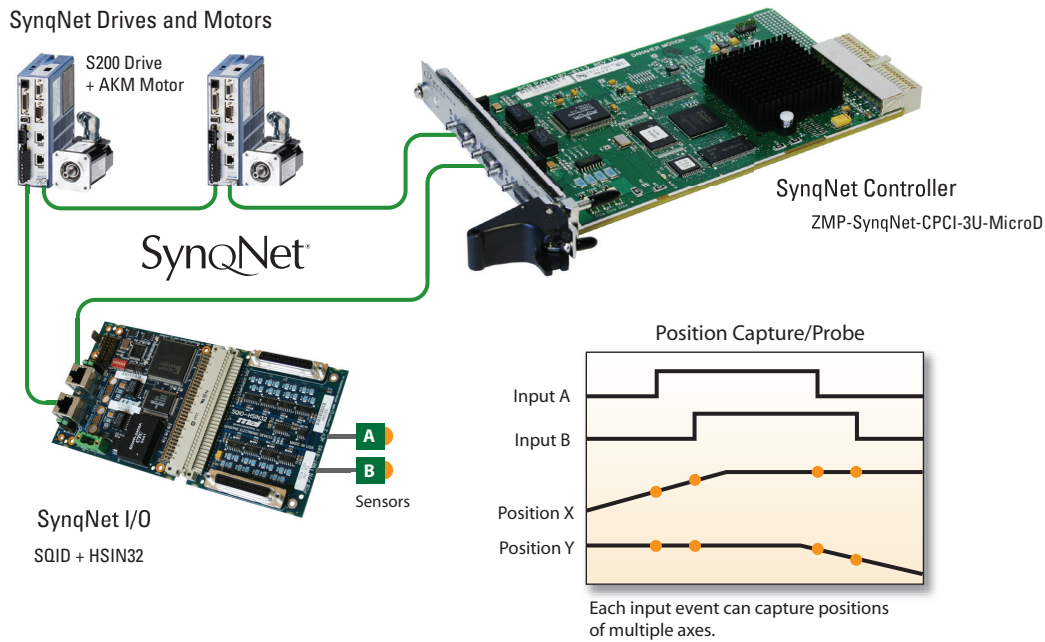
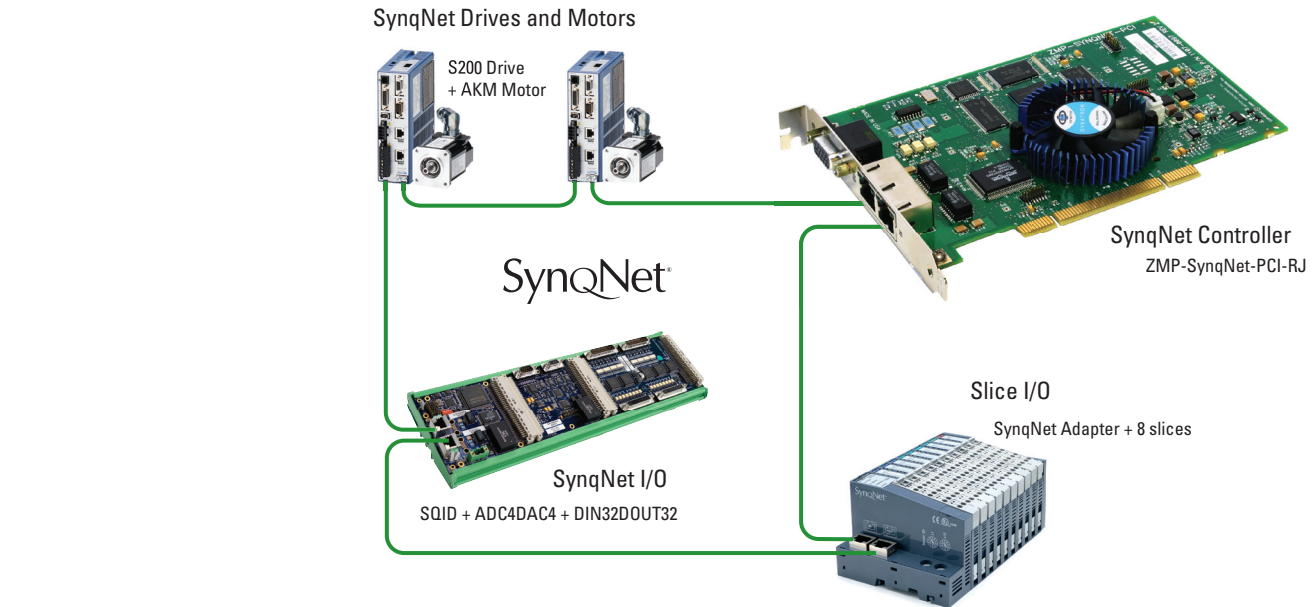


I/O



Custom
Nodes

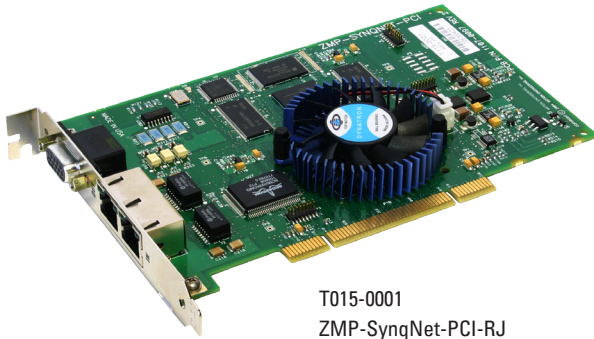
SynqNet Connectivity Diagram



Part Numbers

| Part Number | Description |
|-------------|----------------------------|
| T015-0001 | ZMP-SynqNet-PCI-RJ |
| T127-0001 | ZMP-SynqNet-CPCI-3U-MicroD |

ZMP-SynqNet-PCI



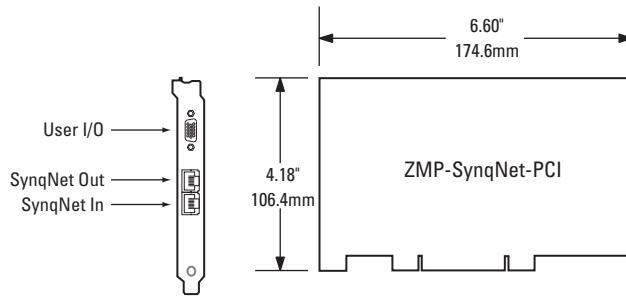
T015-0001
ZMP-SynqNet-PCI-RJ

Specifications

| Function | Parameter | Specification |
|------------------|--|--|
| Processor | CPU | PowerPC 64-bit floating point, 466MHz |
| | Memory | 16MB SDRAM/133MHz |
| Servo Loop | Update Rate | User programmable |
| | 4 Axes Update Rate | Max: 48 kHz |
| | 12 Axes Update Rate | Max: 16 kHz |
| Board Interface | Connectors | SynqNet Interface: RJ45 User I/O: Standard DE (15-pin) |
| | Form Factor | Standard PCI |
| | Host Bus | 32-bit Universal PCI |
| | PCI Bus Speed | 25 - 66MHz |
| | Memory Interface | 32-bit direct memory map |
| | Power | Typ. 5V @ 2.2A Typ. 12V @ 0.1A (required for fan operation) |
| User I/O | Lines | 3 Inputs; 3 Outputs, 1 ESTOP Input |
| | Output Low Voltage | Max. 1.0V @ IO _{UT} = 50mA |
| | Input High Voltage (ON) | Min. 4.0V Max. 28.8V |
| | Input Low Voltage (OFF) | Max 0.8V |
| Kinematic Ranges | Position, Velocity, Acceleration, Jerk | 64 & 32-bit floating point* |
| Environment | Operating Temperature | 0 - 50° C |
| | Storage Temperature | 0 - 85° C |
| | Humidity | 20 - 90% RH, non-condensing |
| | Air Flow | 200 lfm; 1M/sec |

* 32-bit for backwards compatibility, 64-bit extensions available on future releases.

Dimensions



Pinouts and Connector Information

RJ45 SynqNet Connector

AMP Connectors
Mfg P/N 1116353-1

| SynqNet IN | Pin | Signal |
|------------|-----|------------|
| | 1 | Transmit + |
| | 2 | Transmit - |
| | 3 | Receive + |
| | 4 | Unused 1+ |
| | 5 | Unused 1- |
| | 6 | Receive - |
| | 7 | Unused 2+ |
| | 8 | Unused 2- |

RJ45 Mating Connector

AMP Connectors
Mfg P/N 5-557315
Shielded RJ45 recommended

| SynqNet OUT | Pin | Signal |
|-------------|-----|------------|
| | 1 | Receive + |
| | 2 | Receive - |
| | 3 | Transmit + |
| | 4 | Unused 1+ |
| | 5 | Unused 1- |
| | 6 | Transmit - |
| | 7 | Unused 2+ |
| | 8 | Unused 2- |

For more information:
www.amp.com

User I/O Connector

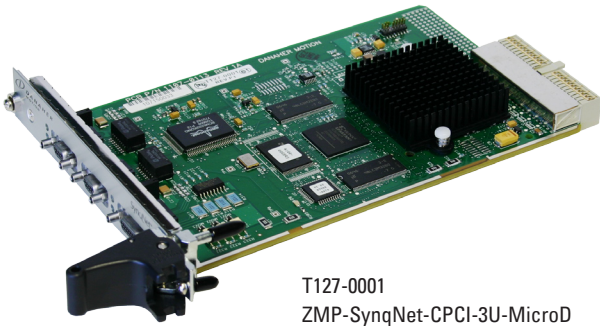
Female High Density D-15

User I/O Mating Connector

Male High Density D-15

| User I/O Connector | Pin | Signal |
|--------------------|-----|------------------|
| | 1 | OPTO_A (OUT) |
| | 2 | OPTO_B_RTN (OUT) |
| | 3 | OPTO_D (IN) |
| | 4 | OPTO_E_RTN (IN) |
| | 5 | XESTOP |
| | 6 | A_RTN (OUT) |
| | 7 | OPTO_C (OUT) |
| | 8 | OPTO_D_RTN (IN) |
| | 9 | OPTO_F (IN) |
| | 10 | XESTOP_RTN |
| | 11 | OPTO_B (OUT) |
| | 12 | OPTO_C_RTN (OUT) |
| | 13 | OPTO_E (IN) |
| | 14 | OPTO_F_RTN (IN) |
| | 15 | GND |

ZMP-SynqNet-CPCI-3U



T127-0001
ZMP-SynqNet-CPCI-3U-MicroD

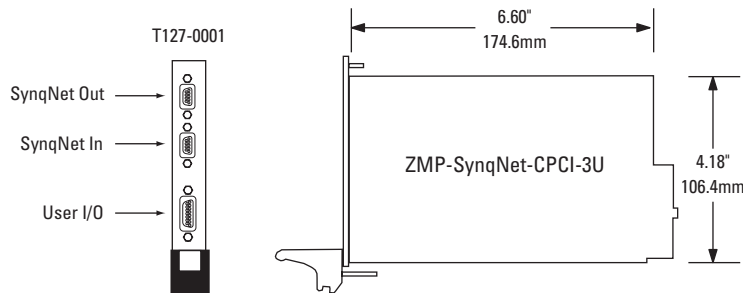
For rear panel I/O options, please contact Danaher Motion.

Specifications

| Function | Parameter | Specification |
|------------------|--|--|
| Processor | CPU | PowerPC 64-bit floating point, 466MHz |
| | Memory | 16MB SDRAM/133MHz |
| Servo Loop | Update Rate | User programmable |
| | 4 Axes Update Rate | Max: 48 kHz |
| | 12 Axes Update Rate | Max: 16 kHz |
| Board Interface | Connectors | SynqNet Interface: Micro-D (9-pin) User I/O: Micro-D (15-pin) Compact PCI 3U |
| | Form Factor | 32-bit Universal CPCI |
| | Host Bus | 25 - 66MHz |
| | CPCI Bus Speed | 32-bit direct memory map |
| | Memory Interface | Typ. 3.3V @ 2.5A |
| | Power | Typ. 5V @ 0.1A |
| User I/O | Lines | 3 Inputs; 3 Outputs, 1 ESTOP Input |
| | Output Low Voltage | Max. 1.0V @ IOJT = 50mA |
| | Input High Voltage (ON) | Min. 4.0V Max. 28.8V |
| | Input Low Voltage (OFF) | Max 0.8V |
| Kinematic Ranges | Position, Velocity, Acceleration, Jerk | 64 & 32-bit floating point* |
| Environment | Operating Temperature | 0 - 50° C |
| | Storage Temperature | 0 - 85° C |
| | Humidity | 20 - 90% RH, non-condensing |
| | Air Flow | 200 lfm; 1M/sec |

* 32-bit for backwards compatibility, 64-bit extensions available on future releases.

Dimensions



Pinouts and Connector Information

Micro-D SynqNet Connector

Molex Inc.
Mfg P/N 83611-9006

Micro-D SynqNet Mating Connector

Molex Inc.
Mfg P/N 83421-9014

For more information:
www.molex.com

| SynqNet IN | |
|------------|------------|
| 1 | Transmit + |
| 2 | Unused 1+ |
| 3 | Ground |
| 4 | Unused 2+ |
| 5 | Receive + |
| 6 | Transmit - |
| 7 | Unused 1- |
| 8 | Unused 2- |
| 9 | Receive - |

| SynqNet OUT | |
|-------------|------------|
| 1 | Receive + |
| 2 | Unused 1+ |
| 3 | Ground |
| 4 | Unused 2+ |
| 5 | Transmit + |
| 6 | Receive - |
| 7 | Unused 1- |
| 8 | Unused 2- |
| 9 | Transmit - |

User I/O Connector

Female Micro-D (15 pin)

User I/O Mating Connector

Male Micro-D (15 pin)

| User I/O Connector | |
|--------------------|------------------|
| 1 | OPTO_A (OUT) |
| 2 | OPTO_B_RTN (OUT) |
| 3 | OPTO_D (IN) |
| 4 | OPTO_E_RTN (IN) |
| 5 | XESTOP |
| 6 | A_RTN (OUT) |
| 7 | OPTO_C (OUT) |
| 8 | OPTO_D_RTN (IN) |
| 9 | OPTO_F (IN) |
| 10 | XESTOP_RTN |
| 11 | OPTO_B (OUT) |
| 12 | OPTO_C_RTN (OUT) |
| 13 | OPTO_E (IN) |
| 14 | OPTO_F_RTN (IN) |
| 15 | GND |

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Helping you build a better machine, faster.