



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



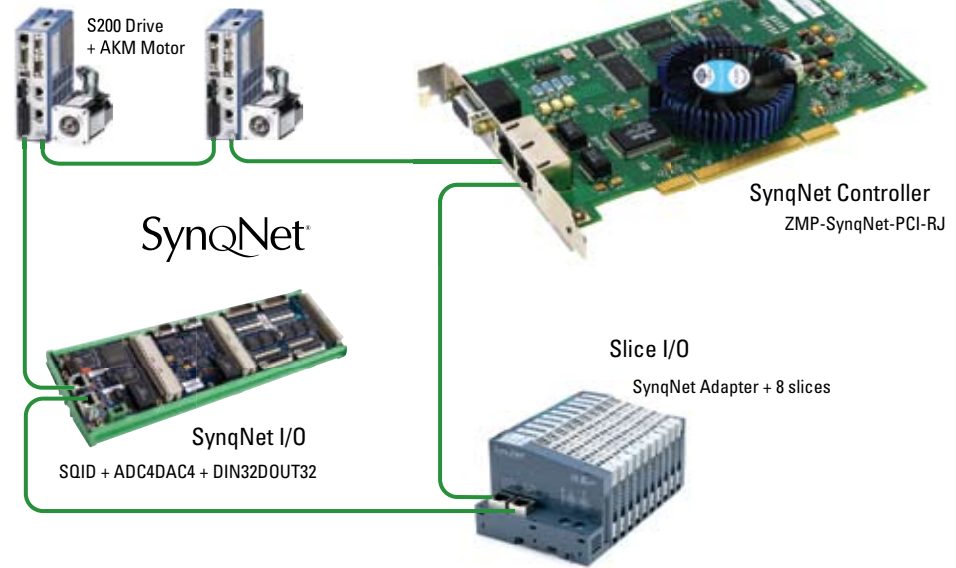
I/O



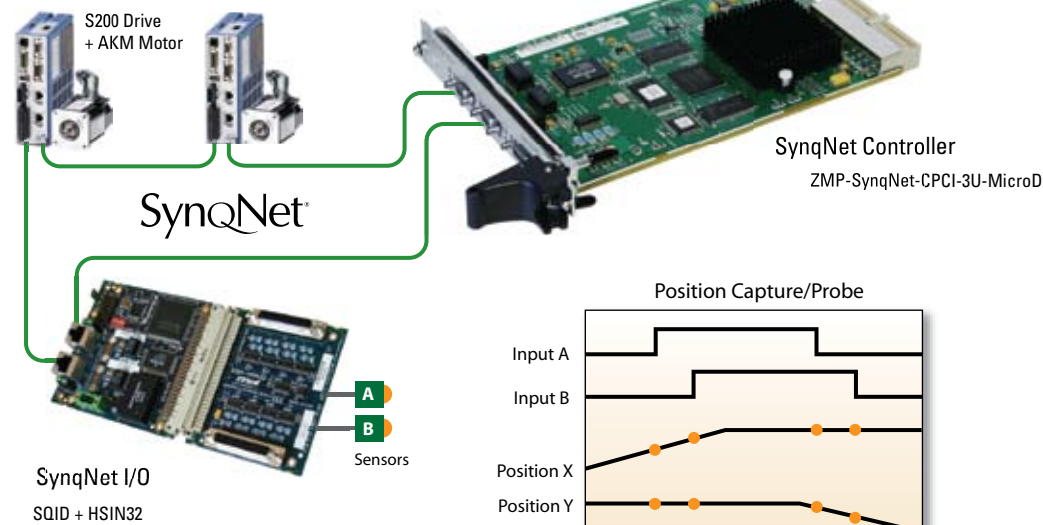
Custom
Nodes

SynqNet Connectivity Diagram

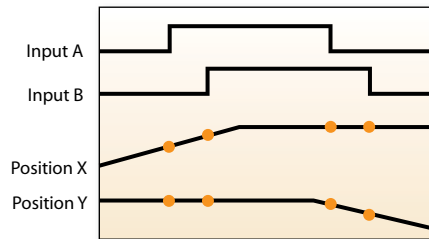
SynqNet Drives and Motors



SynqNet Drives and Motors



Position Capture/Probe



Each input event can capture positions of multiple axes.

Part Numbers

Part Number	Description
T115-0001	ZMP-SynqNet-PCI-RJ
T127-0005	ZMP-SynqNet-CPCI-3U-MicroD
T127-0003	ZMP-SynqNet-CPCI-3U-RJ

ZMP-SynqNet-PCI



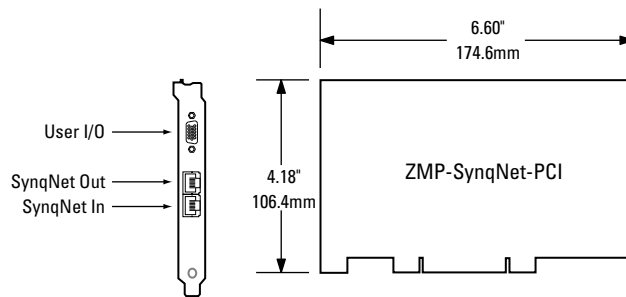
T115-0001
ZMP-SynqNet-PCI-RJ

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 @ I _{OUT} = 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

RJ45 Mating Connector

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

For more information:
www.amp.com

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

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

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



T127-0005
ZMP-SynqNet-CPCI-3U-MicroD
(shown above)

T127-0003
ZMP-SynqNet-CPCI-3U-RJ

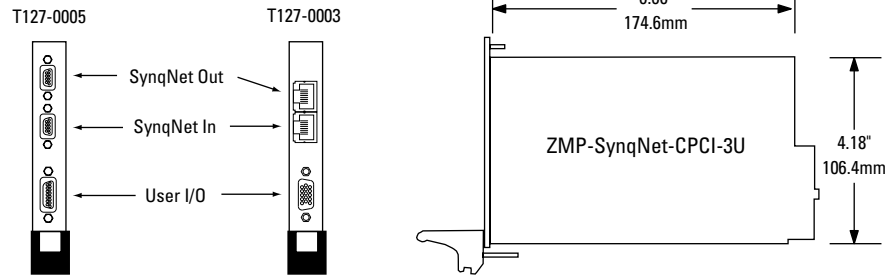
For rear panel I/O options, please contact Danaher Motion.

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	T127-0005 SynqNet Interface: Micro-D (9-pin) User I/O: Micro-D (15-pin) T127-0003 SynqNet Interface: RJ45 User I/O: High Density D (15-pin)
	Form Factor	Compact PCI 3U
	Host Bus	32-bit Universal CPCI
	CPCI Bus Speed	25 - 66MHz
	Memory Interface	32-bit direct memory map
	Power	Typ. 3.3V @ 2.5A Typ. 5V @ 0.1A
	User I/O	Lines: 3 Inputs; 3 Outputs, 1 ESTOP Input Output Low Voltage: Max. 1.0V @ IOU _T = 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.

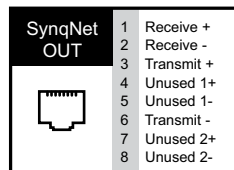
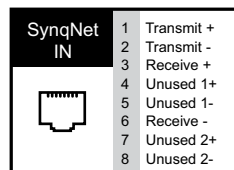
Dimensions



Pinouts and Connector Information

RJ45 SynqNet Connector

AMP Connectors
Mfg P/N 1116353-1



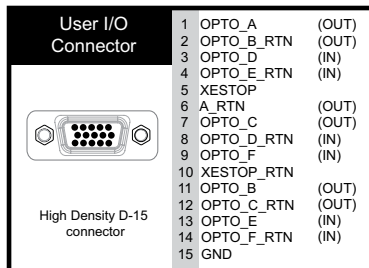
For more information:
www.amp.com

RJ45 Mating Connector

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

User I/O Connector

Female High Density D-15

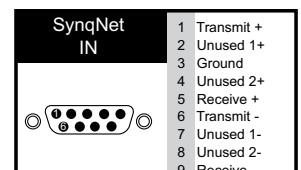


User I/O Mating Connector

Male High Density D-15

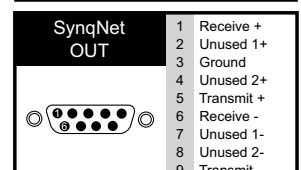
Micro-D SynqNet Connector

Molex Inc.
Mfg P/N 83611-9006



Micro-D SynqNet Mating Connector

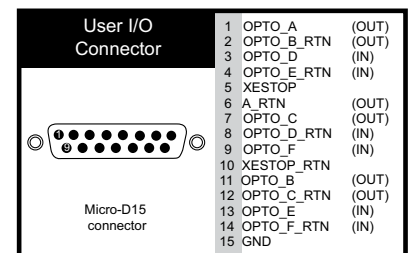
Molex Inc.
Mfg P/N 83421-9014



For more information:
www.molex.com

User I/O Connector

Female Micro-D (15 pin)



User I/O Mating Connector

Male Micro-D (15 pin)

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www.danahermotion.com



Helping you build a better machine, faster.

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