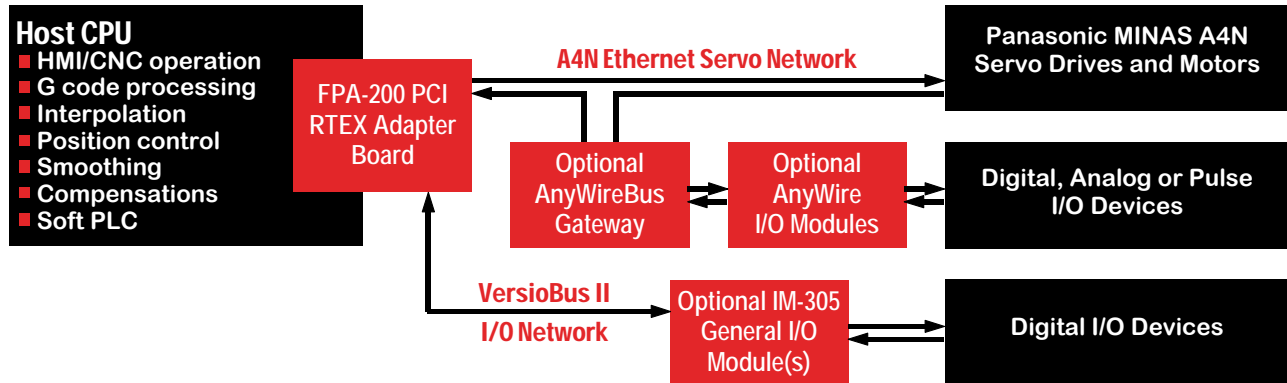


# The Panasonic Realtime Express™ (RTEX) Ethernet-Based Servo Interface



## Overview

Soft Servo Systems offers a variety of PC-based CNC and general motion control (GMC) products for OEM machine builders. Each product is available with a choice of several servo and I/O communications hardware platforms, including the RTEX™ interface system.

The Panasonic Realtime Express™ (RTEX) interface system is an all-digital, minimal-hardware control architecture that works with low-cost Ethernet cables and with Panasonic MINAS A4N servo drive systems from Matsushita Electric Industrial Co., Ltd. This system provides high speed, high resolution, simple wiring and precise synchronization.

MINAS A4N servo drives are based on the high performance MINAS A4, and use the original Realtime Express servo network. RTEX allows high resolution and the command of fast motion that is impossible in conventional pulse interfaces, and its very short transmit time maximizes servo performance. Motion commands are reflected in all axes at the same time, so it's particularly well suited for Continuous Path motion as well as point-to-point motion. RTEX allows information such as parameter settings and data monitoring to be exchanged in addition to motion commands, yet wiring is drastically reduced compared to conventional interfaces. The affordable shielded twisted pair cable lowers system costs, while the high noise immunity (in compliance with IEC61000-4-4) provides excellent servo performance.

Soft Servo Systems, a distributor of Panasonic motors, offers Panasonic MINAS A4N servo drives and motors bundled with our ServoWorks CNC and SMP general motion control products for the RTEX platform.

## Features of the MINAS A4N Series of Servo Drives and Motors

- Easy-to-use servo gain-tuning with “Real-time auto tuning”
- 1,000 Hz speed-loop bandwidth improves productivity
- Vibration suspension filter minimizes vibrations
- Slim design (from 150 mm high x 40 mm wide x 130 mm deep)
- Full closed control of position and speed loops using a linear scale signal (standard) enables high accuracy positioning
- Motor output ranges from 50 W to 5 kW (geared motors are also available for a wide variety of applications)
- Available with 2500 pulse per revolution incremental encoders or 17-bit absolute encoders
- Suitable for applications where large-scale, complicated tasks are required, such as part mounting machines and multi-joint robots – the motor exhibits excellent capabilities specifically in production sites using semiconductor manufacturing equipment, packing/wrapping machines, winding machines, machine tools, fabricating machines, and more



Panasonic MINAS A4N  
Servo Drive and Motor

## RTEX Ethernet Servo Network Features and Specifications

- Control of up to 32 servo axes with a 0.5 ms – 1 ms cycle time
- High-speed communications: 100 Mbps (100BASE-TX) full duplex Ethernet communications servo network with ring topology (IEEE 802.3u)
- Precise synchronization allowing interpolation
- Low-cost commercially available Ethernet LAN servo cables (shielded twisted pair cable, TIA/EIA-568B CAT5e compliant or more)
- 2.5 kV over, IEC61000-4-4 compliant noise immunity
- Daisy-chainable servo drives offer distributed control and multiple nodes with a total servo network length of up to 200 meters (and an inter-node maximum cable length of 60 m), allowing distance between PC, machine and peripherals
- All-digital network eliminates digital to analog conversions, saving money and simplifying system setup and maintenance
- Simple wiring (a single, shielded twisted pair interface cable) and only one interface card (PCI)

## MOTOR COMPANY, MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.

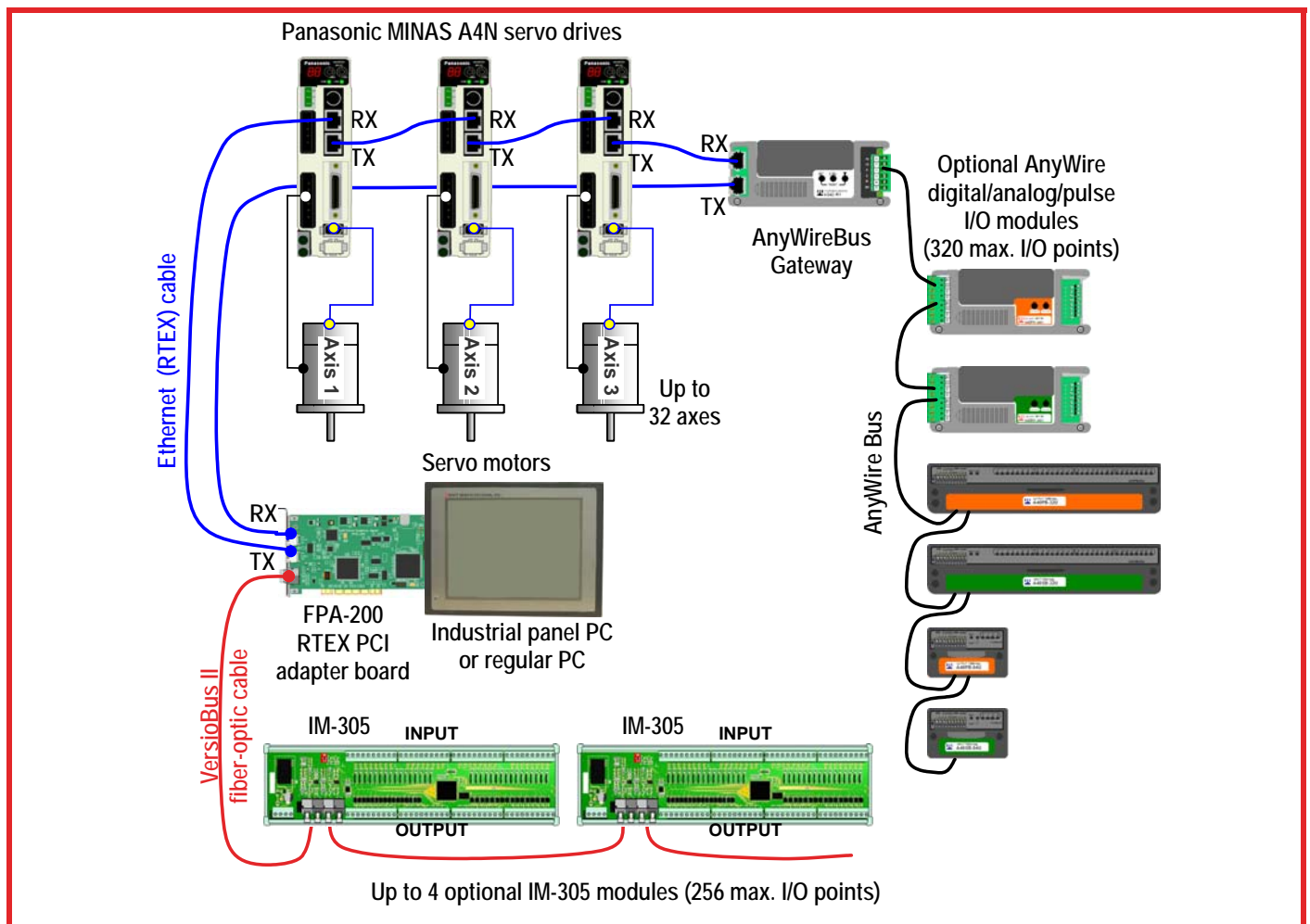
Best known by its Panasonic brand name, Matsushita Electric Industrial Co., Ltd., based in Osaka, Japan, is a worldwide leader in the development and manufacture of electronic products for a wide range of consumer, business, and industrial needs, including servo drives and motors.

For more information on the company and the Panasonic brand, visit <http://panasonic.co.jp/motor/eng>.

## AnyWire Corporation

AnyWire is a well-known brand for distributed I/O systems in Japanese and Asian markets. Their innovative double-duplex communications protocol allows the use of regular electric cables for I/O fieldbus communications.

For more information on the company and its products, visit <http://www.anywire.jp>.



Hardware Connections in the Realtime Express (RTEX) Interface System

## I/O in the RTEX Interface System

There are three types of I/O for the RTEX interface system:

- 1) 4 uncommitted inputs and 2 uncommitted outputs for each A4N servo drive (for up to 16 servo drives)
- 2) Optional I/O with a VersioBus II fiber-optic I/O network connected to the dual-link FPA-200 adapter board, daisy-chaining one to four IM-305 I/O modules (for between 64 and 256 general digital I/O points).
- 3) Optional I/O via an AnyWireBus Gateway included in the RTEX Ethernet servo network. Up to 320 I/O points (digital, analog or pulse I/O) can be connected to the AnyWireBus Gateway with the AnyWire DB protocol.

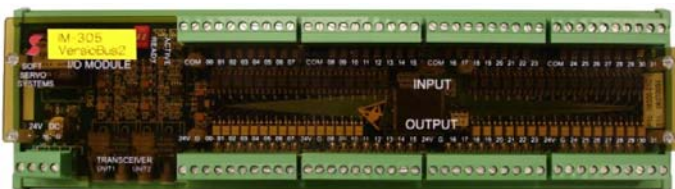
The maximum number of I/O points available for an RTEX interface system is 672: 352 inputs and 320 outputs.

## VersioBus II™ Fiber-Optic Technology for I/O Communications

VersioBus II is a proprietary 5 Mbps real-time fiber-optic digital communications protocol for an optional I/O network, for connecting IM-305s to the PC (via the fiber optic transceivers on the FPA-200 adapter card). The IM-305 is a 64-point general I/O module with built-in wire-entry screw terminals and LEDs. Each IM-305 provides 64 points of I/O (32 inputs and 32 outputs), and up to 4 IM-305s can be daisy-chained together with VersioBus II fiber-optic cables, for a total of 256 points of I/O (128 inputs, 128 outputs).

This optional fiber-optic I/O network features:

- No noise to interfere with I/O communications
- Reduced cables, quick and simple connections, and no maintenance of any connections
- Each fiber-optic cable goes up to 10 meters for distributed control (longer cable is available if required)
- The IM-305 I/O interface modules are daisy-chainable for distributed control and multiple nodes
- Virtually no limit to how far the PC is from the machine or peripherals. The fiber optic cables can extend up to 100 meters



IM-305

## AnyWire Modular I/O System

This popular modular I/O system requires an AnyWireBus Gateway in the RTEX Ethernet servo network. Then, any number of I/O modules can be connected to that Gateway with AnyWire DB cables, up to 320 I/O points.

There are separate AnyWire I/O modules for input and output, available from 4 points to 32 points, so you can purchase exactly what your system requires.




There are I/O modules for diverse I/O needs: digital, analog and pulse. Each I/O module can be mapped to either bit addresses or word addresses.



AnyWireBus Gateway



Sampling of AnyWire I/O Modules

Part No.	Description	Specification	Photo
FPA-200	RTEX PCI adapter board	<ul style="list-style-type: none"> <li>For insertion in a host PC PCI slot</li> <li>Provides two RJ45 Ethernet connectors (TX and RX) for the A4N Ethernet servo network (with ring topology)</li> <li>Provides fiber-optic transceivers for an optional VersioBus II I/O network of IM-305s</li> </ul>	
IM-305	64-point general I/O module (optional)	<ul style="list-style-type: none"> <li>Provides built-in wire-entry screw terminals, LEDs and DIN rail mounting</li> <li>Up to 4 IM-305s can be daisy-chained for up to 256 points of additional I/O, with distributed control and multiple nodes</li> <li>32 optically isolated output points (N-Ch MOSFET), and 32 optically isolated input points</li> </ul>	
3S-FOB4P5-VB/ 3S-FOB10-VB	VersioBus fiber-optic cable (4.5 m or 10 m)	<ul style="list-style-type: none"> <li>For connecting VersioBus II hardware components</li> <li>4.5 meters per IM-305 is included – more cable can be ordered</li> </ul>	
AG-42-R1	AnyWireBus Gateway (optional)	<ul style="list-style-type: none"> <li>For inclusion in the RTEX Ethernet servo network</li> <li>Provides the start of a daisy chain for connecting AnyWire I/O modules</li> </ul>	