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SUBJECT: MicroNet Family Product Support

The MicroNet family is Woodward's premier turbine control product for TMR, Redundant, and Simplex applications. With thousands of installed units, the MicroNet family is extremely important to Woodward and will be supported for the foreseeable future.

Woodward continues to invest heavily in the MicroNet product line to ensure its market success and longevity. In many cases we introduce new parts with additional functionality. In other cases we invest in inventory of obsolete parts or minor module redesigns to use an alternate component. Woodward has a long and successful track record of keeping modules available for 10-15 years and longer, even though many of the original electronic components have gone obsolete in that time.

There are times when Woodward will eliminate certain MicroNet item part numbers. This may be due to the availability of higher performance alternatives, or simple unavailability of electronic components. In these situations, Woodward supports its customers with either direct replacements or functional replacements. Direct replacements drop into older systems with no modifications. Functional replacements offer similar functionality but may require additional modifications such as software updates or replacement of additional modules.

The current status of the MicroNet family is summarized in the Appendix.

When a product is "Rationalized" (end of life for new applications) with no direct replacement, Woodward provides an extended support plan for its customers. Typically Woodward announces the Rationalization a year in advance to give time to design the new component into new applications. Spares and repairs will continue to be available for existing customers for another period of time. The following support plan is normally followed:

- Years 0-5 = Availability of Spares and Repairs
- Years 6-10 = Repairs (based on available parts)
- Years 11-20 = Replacement/Exchange with Service Stock if available (no repairs)

Due to the nature of electronic components, Woodward is often notified of last time buys for various components. Woodward strives to hold inventory or find alternative parts when electronic components are discontinued. However, there are times when components can simply not be obtained and where sufficient last-time buys cannot be made. In these cases, Woodward cannot always guarantee the rationalization support plan.

Best Regards,

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Appendix

MicroNet is available with many configurations and I/O options. The status of the product family is described below. It is not possible to address every option in this document – please contact Woodward for more information or status of specific parts in a given system.

Chassis and Power Supplies

MicroNet Simplex – MicroNet Simplex was the primary simplex offering from 1997 until the introduction of MicroNet Plus in 2005. The MicroNet Simplex chassis and power supply are no longer available for new application after early 2009 but are available for spares and repairs as described in the MicroNet Simplex support statement.

MicroNet Plus (simplex or redundant) – The MicroNet Plus configuration was introduced in 2005 to offer a choice of redundant or simplex CPU's and update the power supplies. It is very successful in the market and important to Woodward.

The MicroNet Plus product will be supported for the foreseeable future.

MicroNet TMR (Triple Modular Redundant) – The MicroNet TMR configuration was introduced in 1997 to offer TMR fault tolerance for ultra-critical applications. The MicroNet TMR enjoys very robust sales and is an important part of our product offering. The CPU's and Kernel Power Supplies were updated in 2009.

The MicroNet TMR product will be supported for the foreseeable future.

CPU's and Transceivers

CPU040 – The Motorola 68040-based CPU040 was introduced in the NetCon product line in the mid-1990's. The CPU040 was the original CPU of the MicroNet Simplex and TMR when it was introduced in 1997.

The CPU040 was replaced in simplex systems with the Pentium CPU in 1999 and the CPU5200 in 2005. The CPU040 is not available for new simplex applications after early 2009. Product support is described in the MicroNet Simplex support statement.

The CPU040 (and associated Kernel Power Supply – KPS) were replaced in TMR systems with the CPU5200 in early 2009. They are not available for new TMR applications after early 2010. The CPU040 and older KPS are supported as described in the TMR CPU040 and KPS Support statement.

Note – The CPU060 (Motorola 68060 processor) had limited usage in MicroNet TMR and simplex systems. It was rationalized in 2005 together with the NetCon product. Spares are available until 2010 as described in the NetCon product support statement.

Pentium CPU – The Pentium CPU (with real time NT operating system) was introduced for the MicroNet Simplex in 1999 to provide more horsepower and features in simplex applications. It was the primary simplex CPU until MicroNet Plus and the CPU5200 were introduced in 2005. The MicroNet Pentium is only available for spares and repairs



as of early 2009. Please refer to the MicroNet Simplex support statement for additional details.

Note – Pentium CPU's may continue to be used to upgrade older NetCon (predecessor to MicroNet) systems as available. Contact Woodward for more details.

Copper Transceiver Modules – The copper transceiver modules supporting expansion chassis for both Pentium and CPU040/060 follow the same support plan as the CPU's used with them.

CPU5200 – The CPU5200 was introduced with the MicroNet Plus in 2005 for simplex and redundant applications, and for TMR systems in 2009. It utilizes the Freescale (Motorola) MPC5200 CPU and VxWorks operating system. The CPU5200 is used on all new TMR, redundant, and simplex applications and will be supported for the foreseeable future.

Note – CPU5200's may be used in older-style MicroNet Simplex chassis as an upgrade to the Pentium CPU or CPU040. Upgrading to CPU5200 on these older systems will require a software upgrade. Other module changes may be necessary as well, depending on the modules being used. Contact Woodward for details. Note – CPU5200's may not be used in NetCon systems.

Remote RTN – The remote RTN module supports expansion chassis in systems utilizing the CPU5200. It is based on the CPU5200 and will be supported for the same time periods as the CPU5200.

I/O Modules and other

MicroNet systems utilize the same I/O modules as their predecessor, the NetCon, as well as offering some newer, higher density modules. In general, all I/O modules are supported with major exceptions listed below.

Discontinued I/O Modules

- Actuator driver modules – older Actuator Driver modules are no longer available for new applications. Spares and Repairs are being supported according to the NetCon support plan.
 - Replacement: Newer Actuator Controller modules are available
- PCM – the Position Control Module was the digital interface to the EM35 Digital Driver and was the predecessor to the RTSIO (that interfaces to the EM (24V) Digital Driver). The PCM will be supported in accordance to the NetCon support plan.
- SIO – some older SIO modules are no longer available for new applications. Spares and Repairs are being supported according to the NetCon support plan.
 - Replacement: Newer SIO modules
- Ethernet (stand-alone) module – the BNC Ethernet module is not available
 - Replacement: Alternative module is available with RJ45 connectors.
- Fiber Optic Transceiver – Fiber Optic Transceivers are no longer available.
 - Replacement: No direct replacement but fiber optic RTN expansion provides a functional equivalent. Contact Woodward for alternatives.