Micro Control Systems
APPLICATION NOTE
APP-043

230vac Control Power and Snubber Networks

Revision History

Date	Author	Description
6/04/07	BWW	Create initial version

Theory

Snubber networks are protection devices consisting of a capacitor and resistor in series that help to eliminate voltage spikes from coming back into a controller or expansion board whenever a relay is turned on or off. When it is functioning normally, this device works very well. However, if a large enough spike is introduced, it can damage the snubber capacitor or resistor. Both of these components must be in good working order for continued protection against spikes. Snubber networks are an integral part of MCS-MAGNUM, MCS-8, MCS-I/O and MCS-RO8 boards.

Symptoms of Snubber Network Failure

In 230vac control power applications where relays frequently cycle (like load and unload solenoids on screw compressors) or relays that switch heavy loads (current > 1 amp) the snubber capacitor or resistor can be damaged due to large spikes it was not designed to handle. Once the on-board snubber capacitor or resistor is a damaged and no longer suppressing voltage spikes, the master microcontroller board may reset due to spikes. If the reset occurs on an expansion board, such as a MCS-I/O or MCS-RO8, the main microcontroller may go into a lockout state, triggering a "Lost I/O" alarm.

Solution

There are two acceptable solutions to prevent voltage spikes from causing the MCS-MAGNUM, MCS-8, MCS-I/O or MCS-RO8 from resetting:

1. Install external snubber networks (MCS Part #: **MCS-SNUBBER**) across all devices being switched by a MCS relay. Do not place the external snubber across the MCS microcontroller or expansion board relay output terminal block. The external snubber network must be placed across the device itself (the load).

2. Upgrade the boards to the latest MCS hardware revision in production. The latest hardware revision for MCS-8 & MCS-I/O is HW Rev 1.66. The latest revision for the MCS-RO8 is Rev. 2.4. All MCS-MAGNUM boards already have this upgrade built-in.