Technical Note 037

**Linking relay outputs to specific warnings or faults**

**Using event word 04.40**

Drive relay outputs are often monitored by control systems. This technical note details how to setup the drive's relay outputs on a 580 series drive to toggle based on a specific warning or fault. The 580 series consists of the ACH580, ACQ580 and ACS580 variable frequency drives.

The drive's default settings dedicate a relay output for general fault status. However, some applications require one of the drive's relay outputs to trigger based on a specific drive warning or fault code, instead of a general warning or fault. For example, a facility may experience power quality issues, such as high voltage transients that cause various equipment to fault and stop operating. The drive's flexibility allows a dedicated relay output to be programmed to indicate an “overvoltage” fault occurred. The knowledge that the drive faulted specifically on overvoltage allows a technician to more effectively troubleshoot the system, without needing to be in front of the drive. Alternatively, had the technician only had access to a general fault indication, then further troubleshooting would have been required. The 580 drive uses the “event word” to tie specific warning and fault indications to relay outputs.

The event word parameters 04.40 – 04.71 used in conjunction with relay output source parameters 10.24, 10.27, and 10.30 allow a specific warning or fault to be tied to a relay output. “Event word 1” parameter 04.40 is a read only status word that has 16 bits. Each of the bits, is linked to one parameter between 04.41 – 04.71 (odd parameters only). Each of the parameters 04.41 – 04.71 can each be set to a unique hexadecimal value that represents a specific warning or fault. When a specific warning or fault occurs on the drive that matches the unique bit in Event word 1 parameter 04.40, the bit toggles from 0 to 1. The drive's relay output can be configured to monitor any Event word 1 bit. For example, relay output source 1 (RO1) 10.24 can be set to monitor one of the Event word 1 parameter 04.40 bits, then the RO1 relay will toggle when the linked corresponding specific warning or fault occurs.

The following is an example of setting up RO1 to toggle on the specific fault “control panel loss”. This fault was selected because it is easy to demonstrate on most 580 demo units or drives installed in the field.

First identify the hexadecimal code that aligns with the fault or warning. The hexadecimal code is found in the 580 firmware manual. The control panel loss fault hex code is 7081.

**Step 1:** Set Parameter 04.41 = 7081
Step 2: Set the Relay output source 1 parameter 10.24 to 04.40 bit 0. This can be accomplished by using the “other” selection at the bottom of the list for parameter 10.24 settings.

The above example is tested by operating the drive in “Hand” or “Local” mode and then removing the control panel. After a short delay, the drive will fault and RO1 will toggle to indicate a control panel loss fault.

The Event word 1 parameter (feature) provides additional flexibility beyond controlling relays. The event word can be used to switch between EXT1 and EXT2 based on a specific drive fault or warning. The control source for the run/stop command and speed/frequency reference may need to change based on a specific fault or warning. “EXT1/EXT2 selection” parameter 19.11 can also be set to monitor a specific bit in “Event word 1” parameter 04.40.

The 580 drive has over 100 different fault or warning messages. Due to this considerable amount of information available within the drive, it was not practical to link them to different bits in predefined status words. Instead a customized status word via Event word 1 is provided with parameters 04.40 – 04.71 to allow monitoring of specific faults or warnings, that then can be linked to different functions in the drive.