



Abstract:

This document provides a step-by-step procedure describing how to set up the heartbeat timeout and the heartbeat manual reset bits in the E3 I/O module.

Products:

All E3 I/O™ modules

Use Case / Problem Solved: Short Description

Heartbeat timeout in the E3 I/O modules provides a way for the outputs controlling critical processes to automatically enter a fail-safe mode when the RTU or SCADA system controlling the outputs stops the heartbeat, is powered down, or loses communication with the E3 I/O module. The Heartbeat manual reset bit provides a manual check for the operator before the RTU or SCADA system can take back control of the outputs on the E3 I/O module. Fail-safe mode triggers when the controlling device fails to provide a heartbeat within the specified heartbeat timeout period; the E3 retains control until an operator toggles the manual reset bit.

Required Software:

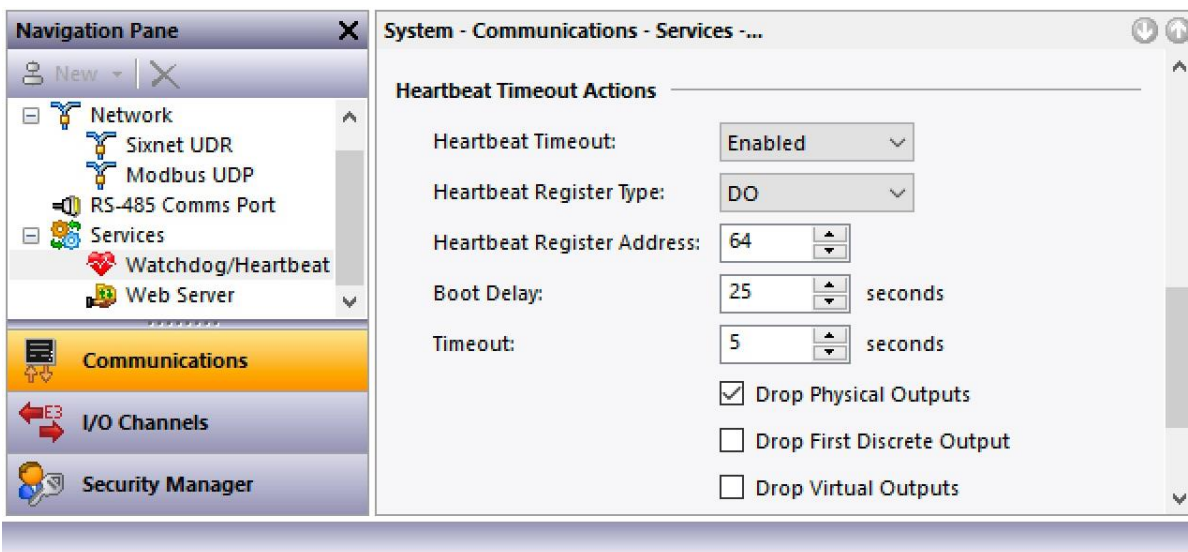
Crimson® 3.0

Required Firmware:

Build 700 or higher

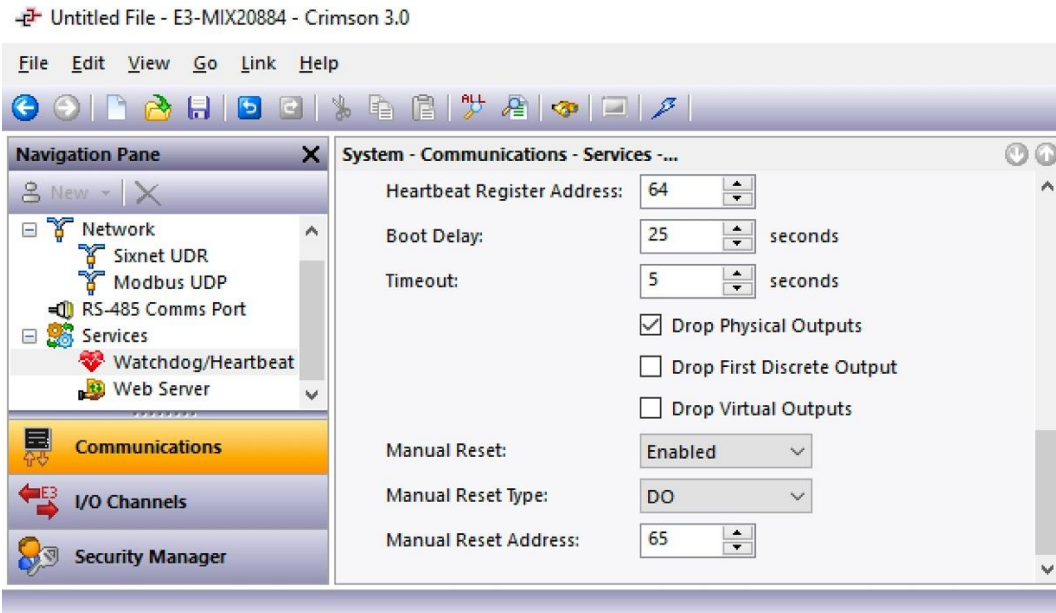
Enable and Configure Heartbeat

1. Click on *Communications* in the Navigation Pane.
2. Click on *Watchdog/Heartbeat* under Services in the Navigation Pane.
3. Set Heartbeat Timeout to *Enabled*.
4. Set the Heartbeat Register Type. *DO* (Discrete Output) is suitable for most applications.
5. Set the Heartbeat Registers Address using an unused. Selecting from the Free Internal Registers in the I/O Channels summary page. Navigate to *I/O Channels > I/O Channels* in the Navigation Pane. In this case, DO 64.
6. Set the Boot Delay. This is the time the heartbeat will take to timeout when the module is first powered-up. This should match the time it takes for the controlling device to boot if it is on the same power circuit as the E3 I/O module. The boot delay consists of the time entered plus the E3 boot time (7s). In this case, 25s, because it is an adequate setting for the Graphite controllers.
7. Enter the Heartbeat Timeout, which is the time the heartbeat will wait before triggering the fail-safe state and dropping the outputs if the heartbeat fails to change state. In this case 5 seconds are specified.
8. Next, set the action to occur on the heartbeat timeout. Dropping physical output (i.e., hardware I/O channels on the E3 I/O module) will be adequate for most applications. Virtual outputs can turn off if using the E3 as an I/O concentrator, or the first physical DO channel can be used as a watchdog bit to provide a physical indication at the location when the heartbeat stops toggling.



Enable and Configure Manual Reset

1. Set Manual Reset to *Enabled*.
2. Select Manual Reset (register) Type. *DO* (Discrete Output) in this case.
3. Define Manual Reset Address. Select an available from the I/O Channel summary page (*I/O Channels > System - I/O Channels*). *DO65* in this case.



Wrap-Up

The controller of choice should write to the DO64 and DO65 registers. In Modbus the equivalent addresses are 000064 and 000065, respectively. If using a Graphite Controller, select the Red Lion Controls E3 driver with the addresses DO64 and DO65. Every time the Heartbeat Register changes state the Heartbeat timeout will reset. If the Heartbeat Register doesn't change state within the heartbeat timeout period, the fail-safe mode triggers. Turning the Manual Reset register (DO65) from OFF to ON resets the heartbeat timeout, returning the outputs to normal operation.

For more information: <http://www.redlion.net/support/policies-statements/warranty-statement>

