| **Test Name** | Pump controller will stop the pump if an alarm signal goes active |
| --- | --- |
| **Use Case Tested:** |  |
| **Test Description:** | This test verifies the firmware will stop the pump if an alarm signal becomes active while the pump is running. |
| **Pre-conditions** | * Pump controller is running (no restartController flag set in status messages) * Pump Not Running * No active alarm signals |
| **Post-conditions** | Same as pre-conditions |
| **Notes:** |  |

|  | **TEST STEP** | **EXPECTED TEST RESULTS** |
| --- | --- | --- |
|  | Issue the ‘n’ command via the serial monitor. | A message is logged saying the pump is being started.  The feather LED lights up. |
|  | Ground the low bore level pin. | A message is logged saying the pump is being stopped due to the low bore level signal.  The feather LED goes out.  A status message is sent with pumpRunning: 0 and lowBoreLevel:1, all other flags 0. |
|  | Release the low bore level pin. | A status message is sent with all flags set to 0. |
|  | Issue the ‘n’ command via the serial monitor. | A message is logged saying the pump is being started.  The feather LED lights up. |
|  | Ground the soft start fail pin. | A message is logged saying the pump is being stopped due to the soft start fail signal.  The feather LED goes out.  A status message is sent with pumpRunning: 0 and softStartFail:1, all other flags 0. |
|  | Release the soft start fail pin. | A status message is sent with all flags set to 0. |
|  | Issue the ‘n’ command via the serial monitor. | A message is logged saying the pump is being started.  The feather LED lights up. |
|  | Ground the no flow pin. | A message is logged saying the pump is being stopped due to the no flow signal.  The feather LED goes out.  A status message is sent with pumpRunning: 0 and noFlow:1, all other flags 0. |
|  | Release the no flow pin. | A status message is sent with all flags set to 0. |
|  | Issue the ‘n’ command via the serial monitor. | A message is logged saying the pump is being started.  The feather LED lights up. |
|  | Ground the pump overload pin. | A message is logged saying the pump is being stopped due to the pump overload signal.  The feather LED goes out.  A status message is sent with pumpRunning: 0 and pumpOverload:1, all other flags 0. |
|  | Release the pump overload pin. | A status message is sent with all flags set to 0. |
|  | Issue the ‘n’ command via the serial monitor. | A message is logged saying the pump is being started.  The feather LED lights up. |
|  | Ground the high pressure pin. | A message is logged saying the pump is being stopped due to the high pressure signal.  The feather LED goes out.  A status message is sent with pumpRunning: 0 and highPressure:1, all other flags 0. |
|  | Release the high pressure pin. | A status message is sent with all flags set to 0. |

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| --- | --- | --- | --- | --- | --- |
| **Test Data Table** | | | | | |
|  | **1** | **2** | **3** | **4** | **5** |
| [Data field 1] | [data set 1 input value for field 1] |  |  |  |  |
| [Data field 2] | [data set 1 input value for field 2] |  |  |  |  |
| [Data field 3] | [data set 1 input value for field 3] |  |  |  |  |

**Results**

10/09/2020

Passed.

Steps 1 – 3

15:41:42.973 -> callback got data 1

15:41:42.973 -> Switched pump on.

15:41:42.973 -> Sending status due to state change.

15:41:42.973 -> LoRaWAN will encode and send this message: {'pumpRunning':1,'boreLowLevel':0,'softStartFail':0,'pumpOverload':0,'controllerRestart':0,'highPressure':0,'noFlow':0}

15:41:42.973 -> Sending status byte: 01

15:41:44.606 -> EV\_TXCOMPLETE (includes waiting for RX windows)

15:41:57.281 -> Sending status due to state change.

15:41:57.281 -> Stopping pump due to low bore level

15:41:57.281 -> Switched pump off.

15:41:57.281 -> Sending status due to state change.

15:41:57.281 -> LoRaWAN will encode and send this message: {'pumpRunning':0,'boreLowLevel':1,'softStartFail':0,'pumpOverload':0,'controllerRestart':0,'highPressure':0,'noFlow':0}

15:41:57.281 -> Sending status byte: 02

15:42:14.228 -> EV\_TXCOMPLETE (includes waiting for RX windows)

15:42:23.650 -> Sending status due to state change.

15:42:23.683 -> LoRaWAN will encode and send this message: {'pumpRunning':0,'boreLowLevel':0,'softStartFail':0,'pumpOverload':0,'controllerRestart':0,'highPressure':0,'noFlow':0}

15:42:23.683 -> Sending status byte: 00

15:42:47.161 -> EV\_TXCOMPLETE (includes waiting for RX windows)

Steps 4 – 6

15:44:01.647 -> callback got data 1

15:44:01.647 -> Switched pump on.

15:44:01.647 -> Sending status due to state change.

15:44:01.647 -> LoRaWAN will encode and send this message: {'pumpRunning':1,'boreLowLevel':0,'softStartFail':0,'pumpOverload':0,'controllerRestart':0,'highPressure':0,'noFlow':0}

15:44:01.647 -> Sending status byte: 01

15:44:03.997 -> EV\_TXCOMPLETE (includes waiting for RX windows)

15:44:12.140 -> Sending status due to state change.

15:44:12.140 -> Stopping pump due to soft start fail signal.

15:44:12.140 -> Switched pump off.

15:44:12.140 -> Sending status due to state change.

15:44:12.140 -> LoRaWAN will encode and send this message: {'pumpRunning':0,'boreLowLevel':0,'softStartFail':1,'pumpOverload':0,'controllerRestart':0,'highPressure':0,'noFlow':0}

15:44:12.140 -> Sending status byte: 04

15:44:32.856 -> EV\_TXCOMPLETE (includes waiting for RX windows)

15:45:02.264 -> Sending status due to state change.

15:45:02.264 -> LoRaWAN will encode and send this message: {'pumpRunning':0,'boreLowLevel':0,'softStartFail':0,'pumpOverload':0,'controllerRestart':0,'highPressure':0,'noFlow':0}

15:45:02.264 -> Sending status byte: 00

15:45:04.644 -> EV\_TXCOMPLETE (includes waiting for RX windows)

Steps 7 – 9

15:46:00.084 -> callback got data 1

15:46:00.084 -> Switched pump on.

15:46:00.084 -> Sending status due to state change.

15:46:00.084 -> LoRaWAN will encode and send this message: {'pumpRunning':1,'boreLowLevel':0,'softStartFail':0,'pumpOverload':0,'controllerRestart':0,'highPressure':0,'noFlow':0}

15:46:00.084 -> Sending status byte: 01

15:46:02.429 -> EV\_TXCOMPLETE (includes waiting for RX windows)

15:46:12.272 -> Sending status due to state change.

15:46:12.272 -> Stopping pump due to no flow

15:46:12.272 -> Switched pump off.

15:46:12.272 -> Sending status due to state change.

15:46:12.272 -> LoRaWAN will encode and send this message: {'pumpRunning':0,'boreLowLevel':0,'softStartFail':0,'pumpOverload':0,'controllerRestart':0,'highPressure':0,'noFlow':1}

15:46:12.272 -> Sending status byte: 40

15:46:30.561 -> EV\_TXCOMPLETE (includes waiting for RX windows)

15:46:53.058 -> Sending status due to state change.

15:46:53.058 -> LoRaWAN will encode and send this message: {'pumpRunning':0,'boreLowLevel':0,'softStartFail':0,'pumpOverload':0,'controllerRestart':0,'highPressure':0,'noFlow':0}

15:46:53.058 -> Sending status byte: 00

15:46:59.930 -> EV\_TXCOMPLETE (includes waiting for RX windows)

Steps 10 – 12

15:48:22.370 -> callback got data 1

15:48:22.370 -> Switched pump on.

15:48:22.370 -> Sending status due to state change.

15:48:22.370 -> LoRaWAN will encode and send this message: {'pumpRunning':1,'boreLowLevel':0,'softStartFail':0,'pumpOverload':0,'controllerRestart':0,'highPressure':0,'noFlow':0}

15:48:22.370 -> Sending status byte: 01

15:48:24.479 -> EV\_TXCOMPLETE (includes waiting for RX windows)

15:48:31.280 -> Sending status due to state change.

15:48:31.280 -> Stopping pump due to pump overload

15:48:31.280 -> Switched pump off.

15:48:31.280 -> Sending status due to state change.

15:48:31.280 -> LoRaWAN will encode and send this message: {'pumpRunning':0,'boreLowLevel':0,'softStartFail':0,'pumpOverload':1,'controllerRestart':0,'highPressure':0,'noFlow':0}

15:48:31.280 -> Sending status byte: 08

15:48:33.399 -> EV\_TXCOMPLETE (includes waiting for RX windows)

15:48:40.438 -> Sending status due to state change.

15:48:40.438 -> LoRaWAN will encode and send this message: {'pumpRunning':0,'boreLowLevel':0,'softStartFail':0,'pumpOverload':0,'controllerRestart':0,'highPressure':0,'noFlow':0}

15:48:40.438 -> Sending status byte: 00

15:48:41.533 -> EV\_TXCOMPLETE (includes waiting for RX windows)

Steps 13 – 15

15:49:34.627 -> callback got data 1

15:49:34.627 -> Switched pump on.

15:49:34.627 -> Sending status due to state change.

15:49:34.627 -> LoRaWAN will encode and send this message: {'pumpRunning':1,'boreLowLevel':0,'softStartFail':0,'pumpOverload':0,'controllerRestart':0,'highPressure':0,'noFlow':0}

15:49:34.627 -> Sending status byte: 01

15:49:35.718 -> EV\_TXCOMPLETE (includes waiting for RX windows)

15:49:41.368 -> EV\_TXCOMPLETE (includes waiting for RX windows)

15:49:59.211 -> Sending status due to state change.

15:49:59.211 -> Stopping pump due to high pressure signal.

15:49:59.211 -> Switched pump off.

15:49:59.211 -> Sending status due to state change.

15:49:59.211 -> LoRaWAN will encode and send this message: {'pumpRunning':0,'boreLowLevel':0,'softStartFail':0,'pumpOverload':0,'controllerRestart':0,'highPressure':1,'noFlow':0}

15:49:59.211 -> Sending status byte: 20

15:50:00.332 -> EV\_TXCOMPLETE (includes waiting for RX windows)

15:50:05.961 -> EV\_TXCOMPLETE (includes waiting for RX windows)

15:50:24.351 -> Sending status due to state change.

15:50:24.351 -> LoRaWAN will encode and send this message: {'pumpRunning':0,'boreLowLevel':0,'softStartFail':0,'pumpOverload':0,'controllerRestart':0,'highPressure':0,'noFlow':0}

15:50:24.351 -> Sending status byte: 00

15:50:26.469 -> EV\_TXCOMPLETE (includes waiting for RX windows)