Communication Module Integration tests.

The RX decode, Communication Control and Message submodules will be integrated.

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| section | No. | Test input | Expected result | Actual result | comment |
| Preamble | H1.1 | Reset button pressed and released | ‘+++’ received from FPGA | correct |  |
|  | H1.2 | ‘a’ sent serially to the module | ‘a’ received from the module | Correct |  |
| Data Frame | H2.1 | ADCwarning port asserted High and then released | ‘AT+SMSEND=“18682734170”,3,”4^DATA FRAME!!\*”{CR} received from FPGA | Fault- sends the expected frame then transmits 4170”,3,”” in an infinite loop | Simulation revisited, fault found in message module, fault rectified  29/01/2018 |
|  | H3.1 | ‘D’ sent serially to FPGA | ‘AT+SMSEND=“18682734170”,3,”4^DATA FRAME!!\*”{CR} received from FPGA | correct | 07/02/2018 |
| Configuration frame | H3.2 | ‘C’ send serially to FPGA | ‘AT+SMSEND=“$$$$$$$$$$$$$$$$$$$$\*”{CR} received form FPGA | correct | 07/02/2018 |
| Irrigation | H3.3 | ‘I’ send serially to FPGA | Irrigation LED asserted high | correct | 07/02/2018 |

Master node tests

Communication Modules Simulations

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| section | # | Test input | Expected result | Actual result | comment |
| Receive process | S1 | Simulate data frame reception | Data corresponding to the frame is input  And indicates when new message is recived,  Asserts message received signal low when key is pressed | correct |  |
|  |  | Simulate consecutive frames | From consecutive frames are recorded |  |  |
|  |  | Reset during |  |  |  |
|  |  |  |  |  |  |
| Indicators | S2 | LED switched on if node has an unresolved issue  Indicator switched on after message received, turn off after key pressed |  |  |  |
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Sensor node Simulation tests

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| Configuration module Simulators | | | | | |
| **section** | **No.** | **Test input** | **Expected result** | **Actual result** | **comment** |
| CalcBlock | S1.1 | Valid Moisture range entered with ph\_EN low | Correct 8 bit value appears at threshOUT | correct | 20/02/2018 |
| S1.2 | Valid pH entered with ph\_EN High | Correct 8 bit value appears at threshOUT | correct | 20/02/2018 |
| S1.3 | INValid pH entered with ph\_EN High | ORR signal asserted high | correct | 20/02/2018 |
| CalcBlock, test inverse Piecewise TF | S2.1 | Test Moisture With  000, 050, 101 | 0x00,0x0D,0x5E | correct | 20/02/2018 |
| S2.2 | Test Moisture with  102, 132, 151 | 0x5E,0x68,0x6F | correct | 20/02/2018 |
| S2.3 | Test Moisture with  152, 356, 403 | 0x6F,0x93,0x9B | correct | 20/02/2018 |
| S2.4 | Test Moisture with  404, 467, 500 | 0x9C,0xB0,0xBB | correct | 20/02/2018 |
| S2.5 | Test Moisture with  501, 759, 999 | 0xBB,0xDE,0xFE | correct | 20/02/2018 |
| CalcBlock pH inverse TF | S3.1 | Test With  041, 100,088 | 0x4A,0xB7,0xA0 | correct | 20/02/2018 |
| S3.2 | pH out of range | ORR = 1 | correct | 20/02/2018 |
| **section** | **No.** | **Test input** | **Expected result** | **Actual result** | **comment** |
| Config Control path | S4.1 | Reset asserted high and then low | Reset state outputs, then idle state enable selectEN = ‘1’ | correct | 23/02/2018 |
| S4.2 | Simulate enter ‘1’ and then enter ‘0’ | Transition to password state, pwd asserted 1 | correct | 23/02/2018 |
| S4.3 | Simulate cancel ‘1’ and then cancel ‘0’ | Transition back to Idle | correct | 23/02/2018 |
| S4.4 | Simulate enter ‘1’ and then enter ‘0’, twice  With Verif ‘0’ | Transition to Verif, then PWD | correct | 23/02/2018 |
| S4.5 | Simulate enter ‘1’ and then enter ‘0’, twice  With Verif ‘1’ | Transition to Verif, then select Edit state | correct | 23/02/2018 |
| S4.6 | Simulate enter ‘1’ and then enter ‘0’ thrice  With Verif ‘1’ | End on EDIT state | correct | 23/02/2018 |
| S4.7 | Simulate cancel ‘1’ and then cancel ‘0’ twice | End on IDLE | correct | 23/02/2018 |
| S4.8 | Simulate enter ‘1’ and then enter ‘0’ four times  With Verif ‘1’ | StartADD held high for 3 clk cyles then end on wait ADD\_DONE | correct | 23/02/2018 |
| S4.9 | Assert ADD\_DONE for 2 clk cycles | Transition to start INV state then stop on wait INV\_TF done state | correct | 23/02/2018 |
| S4.10 | Assert INV\_TF done high | Transition to store state (store = ‘1’) then edit | correct | 23/02/2018 |
| S4.11 | Simulate cancel ‘1’ and then cancel ‘0’ three | End on idle state | correct | 23/02/2018 |
| **section** |  | **Test input** | **Expected result** | **Actual result** | **comment** |
| Config Integration simulation view values | S5.1 | Simulate ADC value update from code 00000 - 11111 | Mo\_### appears where ### will be 23.5 at display vector output | correct | 27/02/2018 |
| S5.2 | Simulate button press ‘1’ | Moisture upper threshold  MoH500 | correct | 27/02/2018 |
| S5.3 | Simulate button press ‘2’ | Moisture optimum  MoO230 | correct | 27/02/2018 |
| S5.4 | Simulate button press ‘3’ | Moisture low threshold  MoL105 | correct | 27/02/2018 |
| S5.5 | Simulate button press ‘4’ | pH upper threshold  PHH085 | correct | 27/02/2018 |
| S5.6 | Simulate button press ‘5’ | pH optimal threshold  PHO067 | correct | 27/02/2018 |
|  | S5.7 | Simulate button press ‘6’ | pH low threshold  PHL061 | correct | 27/02/2018 |
|  | S5.8 | Simulate button press ‘7’ | pH optimal threshold  PHO067 | correct | 27/02/2018 |
|  | S5.9 | Simulate button press ‘8’ | pH low threshold  PHL061 | correct | 27/02/2018 |
|  | S5.10 | Simulate button press ‘9’ | No change- maintains pervious values | correct | 27/02/2018 |
|  | S5.11 | Simulate button press ‘0’ | No change – maintains previous values | Correct | 27/02/2018 |
|  | S5.12 | Simulate button press ‘Enter’ | He display vector is replaced with zeroes, PWD\_EN high | Correct | 27/02/2018 |
| Enter password | S6.1 | Simulate Password entry | Display vector updates as the values are pressed | Correct | 27/02/2018 |
|  | S6.2 | Simulate button press ‘Enter’ | Display shows MoH500 | Correct | 27/02/2018 |
|  | S7.1 | Simulate button press ‘1’ | Display shows MoH500 | Correct | 27/02/2018 |
|  | S7.2 | Simulate button press ‘2’ | Moisture optimum  MoO230 | Correct | 27/02/2018 |
|  | S7.3 | Simulate button press ‘3’ | Moisture low threshold  MoL105 | Correct | 27/02/2018 |
|  | S7.4 | Simulate button press ‘4’ | pH upper threshold  PHH085 | Correct | 27/02/2018 |
|  | S7.5 | Simulate button press ‘5’ | pH optimal threshold  PHO067 | Correct | 27/02/2018 |
|  | S7.6 | Simulate button press ‘6’ | pH low threshold  PHL061 | Correct | 27/02/2018 |
|  | S7.7 | Simulate button press ‘7’ | No change – maintains previous values | Correct | 27/02/2018 |
|  | S7.8 | Simulate button press ‘8’ | No change – maintains previous values | Correct | 27/02/2018 |
|  | S7.9 | Simulate button press ‘9’ | No change – maintains previous values | Correct | 27/02/2018 |
|  | S7.10 | Simulate button press ‘0’ | No change – maintains previous values | Correct | 27/02/2018 |
| Modify pH threshold | S8.1 | Simulate button press ‘enter’ after ‘4’ |  | Correct | 27/02/2018 |
|  | S8.2 | Simulate 131 key sequence sequence | Values in last three displays are updated | Correct | 27/02/2018 |
|  | S8.3 | Simulate button press ‘enter’ |  | Correct | 27/02/2018 |
|  | S8.4 | Simulate button press cancel x3 | Shows MoH value | Correct | 27/02/2018 |
|  | S8.5 | Simulate button pressed ‘4’ | pH high threshold updated to 131  0xEE | Correct | 27/02/2018 |
| Test others | S9.1 | Repeat for tehother threshold values, update to 131 |  | Correct | 27/02/2018 |
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