Wingpath Software Build 2 Problems for Resolution in the 3rd Build   Version 4

1. Alarms have been part-implemented and we do not want you to progress them for the 3rd build except where it is sensible to do so in order to fix problems with the diagnostics window that result from the specified copying of all alarms to this window. Until we ask for the remaining implementation of alarms, we often wish to close the alarm window. This can be achieved by means of ALT+F4 and it does not restore on any subsequent alarm. Please implement the windows close cross (X) at the top right corner of the window so that it is equivalent to the current ALT+F4 action and such that it will not re-open even if an alarm is raised. The user will not be able to re-open the alarm window.

2. Unexpected valve open and close status updates whilst in remote control mode raise alarms A8 & A9, repeated as specified in the diagnostics window. They should not and do not auto-clear, but subsequent occurrences are ignored, other than to update the icon. They should delete the previous alarm of the same type and raise a new alarm with the new occurrence time. Whilst this can be left for a later build, what we do want in the 3rd build is that each new occurrence of the same condition (A8 or A9) should be displayed in the diagnostics window (leaving earlier reports unchanged in this window as a chronological record). Bearing in mind that this is driven from the alarms and an alarm change will be needed in future, we need to balance the effort to fix this aspect of alarms against the nugatory work in fixing just the diagnostics window at the moment. Test with an unexpected change, followed by a user command back to its original position, followed by a further unexpected change; alternatively although unlikely to occur: an A8 condition followed by an A9 followed by a further A8.

3. Alarms A6 (critical temperature) and A22 to A27 (stuck actuator) auto-clear when the condition is no longer reported but are not specified to do so and should not because the next user action (eg to open a stuck open valve) will clear the condition despite the valve still being stuck. There should be no alarm nor diagnostics window message of the form "valve . . . stuck . . . - <u>cleared</u>". As a minimum, the 3rd build should not show the "cleared" messages for alarms A6 and A22 to A27 in the diagnostics window. A new alarm condition of the same type as an earlier one needs to replace the earlier one (per spec 4.7.1) otherwise the alarm buffer could overflow. If replacement is not implemented for every implemented alarm already and would be non-trivial to implement, it is acceptable to display only the latest alarm in the alarm window until alarms are fully implemented.

4. The SBC not only ignores a pipe temperature greater than 125 from the SCS but under this condition, it fails to respond to Modbus messages. The SBC should support at least the ModBus reportable range of 0 - 255C.   The MODBUS specification currently states 0 - 125C and will be amended to 255C to reflect the interface (0x00NN). The SBC software should accept the SCS range of 0 - 6000 (in tenths of a degree) and should report temperatures greater than 255C received from the SCS as 255C on the ModBus. No condition should stop the SBC from responding to Modbus messages from the CRS. The ModBus and SCS/SBC specifications for the PCB temperature are also being changed to -40 to 215°C, transmitted with an offset of 40 as 0 to 255.
PCB temperature is not required to be displayed at the CRS, but we want alarm A6 to be raised when the PCB temperature rises above 125C <u>instead</u> of the current specification of being raised when the pipe temperature rises above that value. The words "CRITICAL TEMPERATURE - rose above" of alarm A6 are to change to "CRITICAL TEMPERATURE: Down-hole electronics rose above". The SBC must respond to modbus requests irrespective of temperature (currently it does not respond whilst the pipe temperature exceeds 125C).

5. Zero temperature and pressure are reported as blank by the CRS on CRS startup but should only remain blank until receipt of the first status message on the MODBUS. A non-zero value is displayed OK and after such a display a subsequent return to zero is correctly displayed.

6. An excessive pressure change alarm A3 is raised at startup despite the pressure being unchanged since the previous run and being displayed in the diagnostics window as history from that run. It should be only be raised at startup if the current value is significantly different to that previously, including that at the last power-down.

7. We have specified a maximum pressure of 10000psi (689 bar) and the software ignores any value above this. We are amending both the SBC and Modbus interface specifications to remove the limit such that any pressure can be displayed 0 to 65535psi. Please implement this increased range, or at least up to 32767 although we have no requirement for negative pressures.

8. Alarm A3 is raised on an excessive pipe pressure change but A2 is not raised on an excessive annulus pressure change and should be. Also, we have found that the specified percentage is too large at high pressures and too small at low pressures so we want you to implement parameter PC3 as default 150psi (rather than as currently default 10%).

9. Similarly for A5 (pipe temperature), we want you to implement parameter PC4 as default 10ºC (rather than as currently default 10%).

10. Further to the above, excessive pressure change alarms are cleared one second after being raised (presumably at the next status message received) and this leads to the "cleared" message in the diagnostics window. These alarms are not specified to auto-clear and should continue to be displayed until manually cancelled (future implementation) and should not be displayed as "cleared" in the diagnostics window (3rd build). It has not therefore been possible to check that a gradual increase that exceeds PC3 per hour will raise the (A2/A3 alarms and) diagnostics window message.

11. The excessive pipe temperature change alarm (A5) and the related diagnostics window message are not raised at all although the pipe temperature exceeding 125C alarm is raised. At least the diagnostics window message for A5 is for the 3rd build. We wish to change the word "pipe" in the message to "Tubing"

12. We want to be able to read the SBC log directly by fitting the memory stick to a USB port on a PC running Windows, as well as to read it via configuration interface commands. It would be advantageous to us if you could write the file twice, once in Linux and invisible to the casual Windows viewer and a copy as a read-only Windows file for direct access from a Windows PC.
    In order to simplify log-dumping via the configuration interface, please add a parameter to the LDAY (or LNEXT) command that allows the default 20 lines to be user-specified, eg to 999. This parameter could usefully be optional for LDAY and must be so for LNEXT. Our preference is for LDAY; both commands need not be modified. We note that the SBC configuration commands are included as required but without a date/time stamp. This is acceptable as implemented.

13. An attempt to change a valve position that returns a DHCS communications failure status leads correctly to the unknown position icon, an unknown valve state alarm (A17) and a diagnostic window message. The specification will be amended so that A17 covers DHCS comms failures as well as Modbus failures. However, the alarm, message and unknown icon self-clear one second later at the next status message. Only the icon should change on receipt of a status message indicating DHCS comms OK. The alarm should be maintained until, when all comms are OK, the user clicks on the icon to change the valve position (future build). The "cleared" alarm and diagnostic window message is not specified and should never be displayed (3rd build). The normal "valve n open" or "closed" message should be displayed on status receipt following the user click.
    An unexpected valve change alarm A8 (orA9) has been seen but should not be raised on resumption of comms because its state was unknown hence no change can be unexpected.
    We assume that your messages "DHCS communications failed" & "Modbus communications failed" are your implementation of alarms A19 & A20. We like them and will change the specification to use your words (hence field <F9> becomes unused).

14. The CRS appears to send parameter PC2 (1 second) periodic Fn3 requests even after a Fn5 change request. No Fn3 message should be sent to a DIAL for parameter PC1 (2 seconds) following a Fn5 change or get status request to the same DIAL. Conversely, a Fn3 should be sent PC1 seconds following a Fn5 request whether PC 2 is set to 1 second, 2 seconds, 3 seconds or more. Periodic requests can be resumed at either the next scheduled time or at PC2 after expiry of PC1 at the implementer's choice.

15. We are adding a new alarm (A29) for a critical pressure rise (similar to A6 for temperature) but this is not required for the 3rd build and neither is a diagnostics window message for it.

16. We are deleting the alarm and associated diagnostics window message for 'Status stale on local mode' (A18) because status is up to 5 minutes stale no matter whether in local or remote modes. We are also deleting the alarm and associated diagnostics window message for 'electronics temperature changed significantly' (A4).

17. The Capacitor Health function has just become obsolete due to a hardware design change, so we now wish to disable it and of course no longer require resolution of any of the issues with this function that were listed in our previous request. The capacitor values will remain in the SCS/SBC status message and should be logged but no calculations are required and the capacitor percentage field in the MODBUS Fn3 response should be set permanently to 100%. Please remove the capacitor health check

button and percentage display field from the Main Screen of the CRS GUI such that the user cannot request capacitor health processing. The underlying software is no longer required and should be removed if to do so is simple and risk-free.

18. Stuck actuator processing has not been implemented and is now no longer required in the SBC software. The existing alarms and diagnostic window messages as currently implemented in the CRS software should remain unchanged although they will not be used in the next build.

19. Please implement Modbus Fn43 in the SBC. The appropriate fields for the response are already specified as SBC configuration interface messages. We are not adding the function to the CRS for this build but we will provide Wingpath with a Modbus simulator which will enable the new SBC function to be tested.

20. In CRC Setup EXE, the first screen text giving the Software Version is partially obscured by the CTD Logo. We will supply the Camcon license text for the second screen later (another build).

20a. The SBC configuration interface is to include the following for the 3rd build:

a) Modbus bit rate, parity and stop bits. These are accepted ("PASS") but do not appear to have any effect on the interface.

b) Vendor Name etc (for Modbus Fn43 as above)

c) DIAL Slave Address & Delete DIAL. These are accepted but do not appear to have any effect on the interface.

d) Actuator Pulse Time

Note that all DIAL addresses can remain as currently implemented (single field 'n') instead of double field ('c,n') because 'c' is a future implementation for the SCS.

21. Although we are not currently implementing multiple DIALs per SCS (field 'c' of MBSA), we will be controlling multiple SCSs and hence need to be able to run the CRS with multiple SCSs each with its own slave address. The following improvements are required for the 3rd build (specification will be updated):

a) Dial number (auto-allocated by the CRS when the DIAL is configured): Please change from a sequence D1, D2 etc so that the numerical part of the DIAL name is the slave address number.

b) Please add the DIAL number to the DIAL name field of the setup screen to match this field of the main screen so that it is obvious which DIAL is being configured. Update this name field on a user-update to the slave address.

We have seen CRS crashes on deleting DIALs from a multi-DIAL configuration but have not so far been able to find a repeatable scenario. We will monitor build 3 after the above changes have been incorporated.

22. Please amend the default valve orifice sizes in CRS setup to 1.5 mm to 5.5 mm in 0.5 mm steps. (a specification change)

23. Please amend the default parameter PC2 (Time between periodic Fn3 messages) from 1.0 second to 5.0 seconds. (a specification change)

24. Please amend SBC initialisation such that the response to any Fn3 status request for a DIAL indicates DHCS failure until the first status message is received from the SCS for that DIAL. Until that is received from the SCS, all other data fields within the Fn3 response should be zero except for the DIAL number and its local mode status. (a specification change)

25. The implemented check on amending a DIAL setup that the DIAL slave address is not a duplicate is also required when creating a new DIAL setup.

David Reaves

For Camcon Technology Ltd   06 October 2011