Build 3 requirements

Wingpath comments with Camcon responses in Blue
Responses from Wingpath in Red
Further responses from Camcon in Green

This is a summary of our understanding of the requirements for build 3, together with a few comments and queries. The paragraph numbers are from your Problem Log 2-7 document.

CRS changes

1. The alarm window is to have a close cross at the top right, and will not re-open even if an alarm is raised. The user will not be able to re-open the alarm window. Agreed.

2. The easiest way to implement the repeated logging in the diagnostics log window is probably to implement the alarm window changes that you want to leave out of the 3rd build! This is because an alarm is only logged if it is raised, and the existing code requires that to raise an alarm any previous alarm of the same type has to be deleted. So we propose that on each occurrence of alarm A8 or A9 any previous alarm of the same type is to be deleted and re-raised with the new occurrence time - this will have the consequence of producing a chronological log in the diagnostics window. Alarm A8 clearing any A9 alarm, and vice-versa, is not necessary for implementing your requirements for the diagnostic window, but would be trivial to do. After further consideration, we no longer require A8 to clear an A9 or vice-versa. OK
We need to clarify what is meant by "subsequent occurrences". For example, the A8 alarm condition "valve <F7> opened unexpectedly" cannot occur repeatedly (a valve that has already opened unexpectedly cannot open again unexpectedly without first closing). So we assume that "subsequent occurrences" means "subsequent Fn3 responses reporting the valve to be in the same state that was originally unexpected" - the interpretation obviously makes a difference to when the alarm is raised. If this interpretation is correct, a new alarm is to be raised every PC2 seconds while the valve remains in that state. Wingpath: No. Only generate the alarm in remote mode and only when a valve state changes between two consecutive status messages without a command to do so. If an A8 had occurred followed by an A9, a subsequent A8 condition can then occur and should add a new message to the diagnostics window and replace the original A8 alarm by another with the new time stamp. Without the A9 (or an intervening user command to change state), there should not be a new A8. OK

3, 10, 13. No "cleared" messages are to be sent to the log/diagnostics window [Agreed except please keep the two "communications failure - cleared" messages for now OK]. Alarms A2, A3, A6, A17 and A22-27 are not to be removed from the alarm window when the alarm condition has cleared. This means that alarms A2, A3 and A6 will remain in the alarm window indefinitely, since the user has no way of clearing them. Agreed for 3rd build. User will be able to delete any alarm at a future implementation. The only alarms that will be cleared (deleted) by the system are A7, A10, A16, A17, A19, A20 & A21 and the deletion conditions are described in the latest CRS Specification draft. No software changes in this area are requested for the 3rd build except those in the problem list and any that would simplify the resolution of a problem. For instance, a new alarm 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 this is not implemented for every implemented alarm already and is non-trivial, it would be acceptable to display only the latest alarm in the alarm window until alarms are fully implemented. The history will be in the diagnostics window anyway. The only way we can "display only the latest alarm" is by replacing the earlier alarm. The requirement is that when a new alarm is displayed, any previous identical alarm should be deleted. If this would extend the build date, a temporary implementation could be to display a maximum of one alarm at a time, namely the most recent one. The log and diagnostic window would show the complete history.
Sorry about the "cleared" messages in the log – these were left in for our testing (and maybe yours), since there is currently no other way to know that an alarm condition has cleared. OK

4. Alarm A6 is to be raised for high PCB temperature instead of high pipe temperature, with the wording "CRITICAL TEMPERATURE – rose above" changed to "CRITICAL TEMPERATURE:

Down-hole electronics rose above". Yes and also, although pipe temperature is not displayed, it must still be included in the modbus interface, and the SBC must respond to modbus requests which currently it does not whilst the pipe temperature exceeds 125C. Isn't pipe temperature still to be displayed? Sorry, yes it is. See "Problem Log 2-8.doc" sent yesterday which corrects this error. This item appears to be just an SCB change.

5. Bug fix: Zero temperatures and pressures are to be displayed when received from the SBC. OK

6, 8, 10, 11. Alarms A2, A3 and A5 are to be implemented in build 3.
As I pointed out in my 15 August email, these are in the specification as "later implementation", so nothing should have been available to test (see your note 10). As it happens, alarm A3 had already been partially implemented before it was decided to implement later, but apart from that there is nothing in build 2 for testing. Comment noted. Implementation of alarms A2, A3 and A5 is optional for build 3 but as we want the alarm messages to appear in the diagnostics window and log, implementation of the alarms is a possible method to achieve this. The only way that we can display/log the alarm messages is by implementing the alarms. Please implement these three alarms.

11. The word "pipe" is to be changed to "Tubing" in the alarm A5 message. OK

7. Pressures up to 65535psi are to be displayed (instead of current limit of 10000psi). OK

8, 9. Pressure and temperature change limits are to be absolute instead of relative. PC3 is to be 150psi instead of 10%, and PC4 is to be 10°C instead of 10%. OK. Clarifying our clarification in item 9, electronics temperature will be used in build 3 by the CRS in relation to alarm A6. There is no electronics equivalent of pipe (tubing) alarm A5, and no pipe equivalent of electronics alarm A6. Sorry if there was some confusion here. OK

9, 16. Alarms A4 and A18 are not to be implemented (so no change required). OK

13. In accordance with section 4.8.2 of the specification, alarm A17 is currently raised only for a Modbus comms failure. Since we do not raise A17 for a DHCS comms failure, it was not possible to reproduce the symptoms that you describe. However, we did find two comms-related bugs, which we will fix: a spurious "closed unexpectedly" alarm, and the valve icon changing from unknown to known state prematurely. Your observation on the specification is noted, but we observed A17 on disconnecting the DHCS and attempting a valve change command. This situation correctly greyed out the comms health button which may be why A17 was generated, and the associated alarm A19 was raised. We will change the specification so that alarm A17 is appropriate to a DHCS failure as well as to a Modbus failure, so your current implementation is OK for the occurrence. The change we require is that the alarm and "unknown state" icon should not be cleared by the next status message. Also, an unexpected valve change alarm A8 (orA9) should not be raised because it has not changed unexpectedly; it just failed to change on command, for which A17 was raised. The unknown state should be cleared once the DHCS comms are restored and the A17 alarm when the user next presses the icon button. See re-run logs below.
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). These alarms are not an implementation of A19 & A20 – they were implemented (for our testing) before A19 & A20 were added to the specification. We have not implemented A19 & A20 since the specification (in section 4.8.4) only requires A19 & A20 to be raised if there is no response to a periodic Fn5 request – and the CRS no longer sends periodic Fn5 requests. Agreed that there are no periodic Fn5 requests. We require no changes to your "for testing" alarms and will change our specification of A19 & A20 to reflect your current implementation.

14. No PC2 periodic Fn3 requests are to be sent between a Fn5 request and its associated Fn3 request (sent PC1 seconds after the Fn5). OK. Note that this requirement is per DIAL and should not affect messages for any other DIAL on the Modbus. Equally, the Fn3 message PC1 seconds after the Fn5 should be for the same DIAL as the Fn5. We note and are including in the specification that you have implemented multiple DIALS at the CRS and that for the normal periodic Fn3 messages, the period is

between messages such that with 3 DIALs, the PC2 periodic Fn3 messages are sent every PC2 x 3 seconds for a particular DIAL. To be sure we have understood, given the additional notes in your 6 October email: we are not to change the Fn3 timing logic (just the default PC2 value), but we are to suppress periodic Fn3 requests between a Fn5 and its associated Fn3. OK

17. The capacitor health check code is to be disabled/removed. OK

18. Stuck actuator processing is not to be implemented (no change required). OK

20. We have tried the CRS setup program at various display resolutions (800x600 up to 1400x1050) under Windows XP without any text being obscured, but we will adjust the layout to try and fix the problem. Screen grab attached from Vista 1680x1050 (XP 1280x800 is identical). We hope to provide Camcon license text for the second setup screen in time for you to incorporate into the third build. It looks as though the image gets scaled differently on a wide aspect-ratio screen. We will adjust the spacing between the image and the text to compensate for this. OK

25. Your 6 October email reported that the CRS allows a DIAL to be added with a duplicate slave address – this will be fixed. OK

SBC changes

4. We have been unable to reproduce the symptom of the SBC not responding to Modbus messages. However, there is a situation which could be mistakenly perceived as the SBC not responding, but which could occur as the result of what we think is correct behaviour according to our understanding of the specification: the SBC reports a DHCS comms failure to the CRS while the SCS is sending out-of-range temperatures (i.e. currently > 125°C) to the SBC. This in turn prevents the CRS from sending Modbus requests other than Fn3, and the SBC would have nothing to which to respond. This does not seem to be the scenario that we witnessed but perhaps the problem will disappear with implementation of the changed temperature range. Responding to your scenario, Fn3 requests should be and currently are sent irrespective of communications failures. Fn5 commands are not sent during communications failures but we do need them to be sent during a DHCS communications failure provided that the control mode is "remote", otherwise the user cannot re-test the DHCS and has to wait for the next periodic 5-minute status update. The specification at 4.7.3 implies otherwise and will be changed appropriately. As you noted in your 6 October email, the CRS already allows the user to request DHCS status even when DHCS comms has failed – so no CRS change is required. Agreed. Only an SBC change.
The range of pipe temperatures accepted from the SCS is to be increased from 0-125°C to 0-600.0°C, and the range reported to the CRS is to be increased from 0-125°C to 0-255°C (with temperatures greater than 255°C being reported as 255°C). OK
The range of PCB temperatures reported to the CRS is to be increased from -40°C-150°C to -40°C-215°C – we assume that the range accepted from the SCS is also to be similarly increased. The offset of 40 is unchanged. OK and 'yes' to the SCS.

7. The range of pressures accepted from the SCS and reported to the CRS is to be increased from 0-10000psi to 0-65535psi. OK

12. As stated in my August 15 email, logging to the memory stick is implemented, and is viewable via the SBC configuration interface as specified. Thanks: Noted that SBC configuration commands are included as required but without a date/time stamp. This is acceptable as implemented. 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. Not sure what you mean by "but without date/time stamp". We will add an optional parameter to LDAY to specify the number of lines. OK. The SBC logfile has entries such as configuration commands without date stamp:

MBBR,4800
MBBR,4800,PASS
and system events with a date stamp:
03/Oct/2011,16:08:12.014, Error,SCS_Comms_Fail, CTS_False
03/Oct/2011,16:37:03.179, SBC_Command,01,06,01
03/Oct/2011,16:37:03.252, SCS_Status,01,c0,00,00,12,98,98,00,b7,00,2f,00,e0,3e
This is OK as implemented.

I do not think that the method of viewing the text file from the memory stick has yet been addressed in the specification. However, what you can do is use a utility such as ext2explore (see http://www.howtogeek.com/howto/33387/how-to-browse-your-linux-partition-from-windows/) to copy the file to Windows. The log file is in the last Linux partition on the memory stick, and is called "camcon/scs.log". Thanks. However, we do need this file to be written such that it can be directly viewed from Windows. 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. Required for the third build. We will write a copy of the log file to the Windows partition on the memory stick, but you should be aware that this partition is only 4MB in size (since it is intended to be used only for booting the system). Can the windows partition be significantly extended, eg to half of the total memory?

17. The capacitor health reported to the CRS is to be fixed at 100%. The capacitor health check code may be removed (although logging of the capacitor values received from the SCS is to remain). OK

18. Stuck actuator processing is not to be implemented (so no change required). OK

19. Modbus Fn43 and the associated configuration interface commands (MVEN, MPRO, and MREV) are to be implemented. OK

Further Requirements, added 3rd October 2011 by Camcon

20. 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
These commands (apart from those for Fn43) are fully implemented – the user has to type "SAVE" to apply the the changes. OK.
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. OK

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. OK
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. OK
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) OK

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

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) OK

Re-run of problem 13

Diagnostic window

15:45:45 D2 Open valve 2
15:45:47 D2 DHCS communications failed
15:45:48 D2 communications failure: state of valve 2 unknown. Try again.
15:45:49 D2 communications failure: state of valve 2 unknown. Try again. - cleared **[should never occur on a Fn3 response, and icon should remain "unknown" until comms OK at 15:47:11]**
15:45:49 D2 valve 2 closed unexpectedly
15:47:08 D2 Test communications health
15:47:11 D2 DHCS communications failed - cleared **[Keep this useful message and the one for modbus comms for now]**
15:47:11 D2 Status: 25°C,181psi,47psi,107%,OP1,CL2,OP3,CL4,OP5,OP6

Modbus monitoring

15:45:47 D1: Read Registers (Modbus: 1, 3, 0, 0, 0, 9, 133, 204)
15:45:47 D1: CRS in control, : No DHCS response, Open: OXOXOO, no faults, Cap: 107%, Ann: 181psi, Pipe: 47psi, 25C, Board: 26C, (Modbus: 1, 3, 18, 0, 0, 0, 129, 53, 0, 0, 0, 0, 107, 0, 181, 0, 47, 0, 25, 0, 66, 61, 30)
15:45:48 D1: Read Registers (Modbus: 1, 3, 0, 0, 0, 9, 133, 204)
15:45:48 D1: CRS in control, : No DHCS response, Open: OXOXOO, no faults, Cap: 107%, Ann: 181psi, Pipe: 47psi, 25C, Board: 26C, (Modbus: 1, 3, 18, 0, 0, 0, 129, 53, 0, 0, 0, 0, 107, 0, 181, 0, 47, 0, 25, 0, 66, 61, 30)
15:45:50 D1: Read Registers (Modbus: 1, 3, 0, 0, 0, 9, 133, 204)
15:45:50 D1: CRS in control, : No DHCS response, Open: OXOXOO, no faults, Cap: 107%, Ann: 181psi, Pipe: 47psi, 25C, Board: 26C, (Modbus: 1, 3, 18, 0, 0, 0, 129, 53, 0, 0, 0, 0, 107, 0, 181, 0, 47, 0, 25, 0, 66, 61, 30)

SBC - SCS interface monitoring

15:43:28 SCS 1, D 1 Status: Remote, DHCS OK, Valves Open: 6,5,3,1, Cap start: 152, end: 152, Pressure annul: 181, prod: 47, temp pipe: 25.7, PCB:26 (SCS: 0, 64, 0, 0, 53, 152, 152, 0, 181, 0, 47, 1, 1, 66, 205)

User note: Problem 13 retest, no DHCS comms

15:45:45 SCS 1, D 1 Open 2 (SBC: 0, 1, 2, 3)

15:45:47 SCS 1, D 1 Status: Remote, No DHCS, Valves Open: 6,5,3,1, Cap start: 152, end: 152, Pressure annul: 181, prod: 47, temp pipe: 25.7, PCB:26 (SCS: 0, 64, 0, 129, 53, 152, 152, 0, 181, 0, 47, 1, 1, 66, 78)

User note: Reconnect DHCS & press comms health button

15:47:09 SCS 1, D 1 Get Status (SBC: 0, 3, 0, 3)

15:47:10 SCS 1, D 1 Status: Remote, DHCS OK, Valves Open: 6,5,3,1, Cap start: 152, end: 152, Pressure annul: 181, prod: 47, temp pipe: 25.6, PCB:25 (SCS: 0, 64, 0, 0, 53, 152, 152, 0, 181, 0, 47, 1, 0, 65, 203)