



Q&A for FRC Suppliers - 2013

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FRC Technical

Q. Hello, We have been struggling to get the camera to work with Labview. We are using a Zavi F210A camera. We have installed the drivers of that specific camera, yet we get stuck in the 'Axis camera configuration utility' when it asks to set the credentials frc:frc; we don't know where to add them, would you mind helping us. By the way, the config utility actually detects the camera. Would you mind helping us? Any help is greatly appreciated. Best Regards, Richi

A. The WPILib Software is designed to use an Axis IP Camera. The Axis 206 and M1011 are fully supported, the M1013 has been tested and is supported with the differences noted [here](#). It is unclear from looking through the documentation of the Zavi camera if WPILib can be easily modified to work with this device. Even if it can it will likely require significant customization of the camera VIs and proper setup of the camera settings. If you wish to simply view the camera on the Driver Station computer, you may be able to do so by setting the IP to 10.XX.YY.11 where XXYY is your team number, plugging the camera into the radio on the robot and viewing the feed using a web browser either in place of or in addition to a Dashboard.

Q. Follow up to Q73. I now see I need to have TestPeriodic in Robot.cpp which may be causing some of my problems.

A. Yes. To use LiveWindow, TestPeriodic should have a call to LiveWindow::GetInstance()->Run() in it so that the LiveWindow code actively updates the values in the indicators and acts on the controls from the SmartDashboard. Both creating a project from the Command Based Template in WindRiver and creating a project using RobotBuilder should populate the appropriate calls to the Scheduler and LiveWindow necessary to use the Command Framework automatically.

Programming

Q. RobotBuilder v623 - I'm following youtube videos. When Lower Wrist (SetPoint command) is created the code generated for C++ puts Robot::wrist->Enable(); Robot::wrist->SetSetpoint(4.25); in Execute method whereas youtube video and Java code puts it in Initialized method

A. Because nothing else can operate on the subsystem (due to the Requires()) and the calls to Enable() and SetSetpoint() are pretty minimal, you should see very little or no difference between these two implementations. Having said that, the Initialized method is probably the better place for these calls and I have [filed a bug in the RobotBuilder tracker in the WPILib project](#).

Q. How do you enable the WDB Target Agent in Windriver while connecting to the cRIO?

A. There are a couple reasons you may be seeing an error regarding connecting to the WDB Target Agent. Try the following steps in order to see if any resolve your issue, try connecting after each step to check if the issue persists.

1. Verify your cRIO is imaged with the latest image (v47) and set to C++. [Instructions here](#).
2. Make sure the Target Server connection properties are correct. [Instructions here](#).
3. Check that your IP address is set to 10.XX.YY.ZZ where XXYY is your 4 digit team number and ZZ is an unused address on the network (.5 if the machine is also the DS, otherwise .12 and up should be safe).
4. Try disabling any Network Adapters other than the one you are trying to connect to the cRIO with using the Control Panel.
5. Try disabling Windows Firewall using the Control Panel.

LabVIEW

Q. I downloaded LabVIEW 2013 for FRC Season 2014 from online. Then, I downloaded the Update Suite, but when I tried extracting the files from the ZIP folder, it said that the files were password protected. What should I do about this?

A. The password for all FRC encrypted material was at the end of the kickoff video. It is

"3Zones2Goals1Alliance!". I will add that to the NI Update documentation while we work on getting the unencrypted release posted.

Q.Thanks for your help. I was trying (and succeeding) in making this more complicated than it was. We have now successfully implemented NT's in our project.

A.Great!

Q.I think we've done this, but the details are probably missing. When you specify the table name are there any restrictions other than uniqueness? When you implement the SD vi's in the server the table name and variable names types you are trying to receive I assume must match. We currently have the dashboard pc and the robot CRIO both hardwired to the router for debugging purposes. Since I'm not seeing the data I'm sending to the robot on the front panel vi indicator I've wired to the SD read vi output, how can I confirm that I even have a network connection between the client and server vi's? I don't see any error status from the SD vi's. (error out's not wired?)

A.As you have noted, the network connection status of the Network Tables VIs is not visible at the top level. We will look to improve this moving forward. If you open up the NT Client VI, you can use probes and/or highlight execution to check the state of the network connection to the NT Server.

Q.Network Tables: I need more specific information on how to setup network tables in Labview. The server runs in the the robot code and the client in the Dashboard code. We have a custom Dashboard implementation that doesn't use any of the default panels, it contains a camera interface and vision processing code. We want to send data from the processing code back to the robot in autonomous mode. The information I need is how to configure the sever and client to run in this situation.

A.All that is required for the Server side is for the NT Server VI to be dropped into your Robot Main outside the loop. This should be done by default if you created your project using this year's LabVIEW update. Then wherever appropriate, use the NT Read or SmartDashboard (SD) Read VIs to read the values from the table. You may need to wire in an Update Time to the NT Server VI to replace the default, depending on your desired rate. The SmartDashboard VIs are just a special class of the Network Tables VIs that use a \SmartDashboard namespace in the tables. On the Client side if you wish to automatically bind your controls to SmartDashboard variables you can use Loop 3 of the LabVIEW Dashboard project as an example and you can modify as appropriate . If not, you can simply drop the NT Client VI into your Dashboard code outside any loops, making sure to wire in the appropriate Server IP and Update Time for your setup. Then call the NT Write or SmartDashboard Write VIs as desired (likely in a loop in your Dashboard Code).

C++

Q.Follow up to Q64. Can you describe the differences between Command->Run and Command->Start? I watched the videos, but I am still confused.

A.Command->Start is used to schedule a command to be run when the Scheduler runs next, it is typically called internally by Buttons or Triggers, but could also be called by the user. Commands are typically scheduled by creating Button or Trigger objects for the command that schedule it automatically when a particular condition occurs (a button is pressed, a button is released, a limit switch is pressed, etc.) Command->Run is used internally by the Scheduler to run the appropriate part of the command each time the Scheduler runs. Command->Run is not designed to be called by user code.

Q.Need help with command scheduling. I declare a SodaDelivery cmd grp. How do I schedule it? Do I create a SodaDelivery object and call its Run method? What if my object goes out of scope before the command group is run? Is the robot program multithreaded? Do I need to create a Scheduler? Confused

A.If using Commands or Command groups, you do need to periodically call the Run() of the Scheduler in order to run scheduled commands and schedule new commands as appropriate. When creating a project using the Command Based template option or with RobotBuilder, these calls are automatically placed appropriately in the Autonomous and Teleop modes. Commands are typically scheduled automatically by the scheduler by linking them to Buttons in the OI. You may find the [WPILib Cookbook](#) and the [videos posted by Brad Miller from WPI](#) to be helpful in understanding the Command Based architecture.

Java

Q.The resolution of the problem required the McAfee software to be uninstalled and removed from the PC. What testing is done to validate the code works with different virus and firewall software? We would have used a different PC had we known. Is there a better way to alert teams to potential issues other than support Q&A? Also, we were successful in copying the "image.suite" file to the cRIO and renaming to "robot.suite" but when we restarted the cRIO the code did not execute - can you confirm these were the correct steps?

A.Due to the vast number of antivirus and firewall packages available, the different versions of these software packages, and the settings within the packages it is not possible to test that the FRC software works with all configurations. Known and/or identified issues that are found during testing are included in the ["Known Issues" section of the 2013 Software Notes](#). The state of the cRIO described in your previous question may have been misinterpreted. If code has not been successfully deployed to the cRIO since it was last imaged there are additional files that would also need to be copied. From the sunspotfrcsdk/cRIO folder FRC_UserProgram.out needs to be copied to /ni-rt/system/FRC_JavaVM.out and squawk.out and squawk.suite need to be copied to the same directory.

Q.Cannot get past FTP to cRIO when Deploy and Run. Was working before updating plugins. Drive Station connects to cRIO. Image tool applied new Image to cRIO. manual FTP connects to cRIO. direct connect cable to cRIO. wireless adapter turned off. How to remove update to plugin -OR- work around to deploying code to cRIO?

A.The midseason Java updates did not make any changes to the ant scripts used for building or deploying code. Try disabling Windows Firewall if it is enabled. After imaging the cRIO, make sure to manually reboot the cRIO when you first see the line "waiting to connect to OTA server". If you do wish to install an earlier version of the plugins you will need to do so manually. Open the plugin window in Netbeans, uninstall the existing FRC plugins, then delete the folder \sunspotfrcsdk. Then download the desired plugin version from the [WPILib project page](#) and install them manually as described in the "Downloading the Plugins" step and subsequent steps of [this document](#) (use the plugins downloaded from the WPILib project in place of downloading them from the site in the document. The work-around to the FTP step, if the deploy is reaching this point is to attempt a deploy to that point (note this is different than simply clicking Build), then locate the file image.suite in the build folder of the project. FTP that file to the robot in the /ni-rt/system/ folder and rename it to robot.suite then reboot the cRIO.

Driver Station

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Q.Are there any requirements on the IP ranges that can be used by the driver station PC? I know there is a default that the classmate uses, but is it necessary for the DS computer to be on a certain IP? Or can it be anything on 10.xx.yy.zz that doesn't collide with something else?

A.When used at home, the Driver Station software may be run on any machine on the same class C subnet (10.XX.YY). When running at the events, the Driver Station computer's wired NIC must be at 10.XX.YY.5 to properly interface with FMS.

Q.I am working on developing my own vision tracking code as a camera extension widget, and I've been having issues with getting it working. I have a main program to test it in a standalone mode, and I see it complaining about not finding the needed libraries in the java path. I have the Netbeans project using the jar files from the 1.04 install, and the path certainly seems to include the needed files. I have Windows 7 64 bit, and it looks to me like the SmartDashboard was compiled against versions of javacv/opencv that are 32 bit. if I run it with the 32 bit VM, it runs correctly. Is there an easy way to use the 64 bit versions of these libraries? or am I stuck running a 32 bit VM? or am I completely misinterpreting things?

A.For now the recommendation is to use the 32-bit VM. Using the 64-bit JavaCV libraries and running in the 64bit JVM is currently untested.

Q.We cannot get video feed from our camera (m1011) to our Drivers Station. We can get video from the camera using Internet Explorer and the camera's IP Address. We have updated the Drivers Station, camera, and D-Link. We are using Wind River (c++). Please reply if you know how to help us.

A.For the default dashboard to connect to the camera, the camera must be located at 10.XX.YY.11, where XXYY is your 4-digit team number, and must have an account with username FRC and password FRC. Instructions for manual and automated setup of the camera are located [here](#). For the Dashboard to connect to the camera you must have the Driver's Station software open and connected to the cRIO (you will see the proper IP show up in the Robot IP indicator on the Dashboard). You may also try disabling any firewall or internet security software to verify that it is not interfering with the connection from the Driver Station to the

camera.

Q.Q61,62 Follow up. If there is any documentation on the Driver Station Log File Viewer please provide a link as the link in the screensteplive documentation is red and nonfunctional. I am specifically looking for info on CPU utilization. Was the out of range CPU utilization issue described for the Driver Station Charts tab addressed in the last DS update?

A.Yes, the CPU Usage plotting issue has been corrected in DS Update v2 (version 1.29.13.00). The CPU Usage should now plot against the proper scale in the Charts tab of the Driver Station. Documentation about the warning/error messages generated by the DS has been posted [here](#). Documentation about the Driver Station Log Viewer has been posted [here](#). The link in the Software Component Overview has also been updated to point to the new Log Viewer documentation.

Q.SmartDashboard. I spent today applying sw updates, Labview,DriverStation and C++. I see a new version of the SmartDashboard in C:\Windriver\WPILib and there is one in c:\Program Files\SmartDashboard. When I select the C++ dashboard in the DriverStation how does it know which of these to execute? I am assuming the .jar file is the C++ Smart Dashboard. My file system Directory of c:\Program Files\SmartDashboard
08/09/2011 03:08 PM 21,504 SmartDashboard.exe 01/15/2013 02:09 PM 2,304,284 SmartDashboard.jar 2
File(s) 2,325,788 bytes Directory of c:\WindRiver\WPILib 02/07/2013 03:36 PM 2,304,666 SmartDashboard.jar
02/07/2013 03:36 PM 912,516 SmartDashboard.javadoc.zip 2 File(s) 3,217,182 bytes

A.The C++ button on the Dashboard launches the SmartDashboard included with the C++ Update as documented on [this page](#). The SmartDashboard for C++ and Java are the same Java application, the buttons just point to the location the SmartDashboard is installed to for that development language. Until a new SmartDashboard Installer including the latest client is published, to use the latest SmartDashboard jar file with the camera extension, you can set up the SmartDashboard as detailed [here](#), leaving the Dashboard Type in the Driver Station as "Default". Then copy the SmartDashboard.jar file from C:\Windriver\WPILib to the C:\Program Files\SmartDashboard folder, replacing the existing one there.

Q.Smartdashboard - LiveWindow. The Smartdashboard (SD) doc says implicit test mode "All sensors and actuators will automatically be displayed on the SD in test mode". Is implicit mode working? I don't see any items unless they are explicitly added. I do see an Ungroup Analog Channel [8,1] (value = 7.145) which is NOT in my robot program. I would expect to see all components in the Robot Map implicitly added. Additionally, I do not see the File and View menu items in LiveWindow mode. I have to Disable Test mode to access the View - Editable feature which did not appear to be the case in the Youtube videos. I was able to get the camera image on SD, but was hoping to see an Axis widget enumerating all the camera parameters.

A.All objects with LiveWindow implemented should be added implicitly and appear in the Ungrouped section of the LiveWindow display, you may have to resize the Ungrouped box to see all entries. The Analog Channel entry you are seeing is the implicit entry for the battery voltage monitoring channel created by the DriverStation class in the robot code. Any item added to the LiveWindow explicitly will override the implicit addition and will instead appear in the Subsystem it was added to. I am unable to reproduce symptoms of the File and View menus disappearing with either the [1.03 or 1.04 SmartDashboard installers](#) which install the extension for the Axis camera. The way the SmartDashboard requests the camera stream is different from how the LabVIEW Dashboard does it. The LabVIEW Dashboard requests a stream using a specific frame size, framerate, and compression. The SmartDashboard requests an anonymous stream which uses the camera settings for these parameters. You can change these parameters by logging into the Camera and setting them through the web interface. If you would like to see a widget to set these parameters from the SmartDashboard in the future you can file a bug on the [SmartDashboard tracker](#).

Q.Driver Station - SmartDashboard. I am following the youtube RobotBuilder videos. I get Test mode working and see all the devices in LiveWindow. However, when I start to define Commands I see the command buttons on the Smartdashboard, but the LW/devices goes away. Can I have both LW and Commands?

A.LiveWindow is designed to work with the Test mode of the Driver Station, allowing you to perform low level tests of sensors and actuators, regardless of the code you have written. In order to allow LiveWindow to do this, the Test mode (by default) does not run the command scheduler. If you put your robot in any mode other than Test Enabled, you will see the Command buttons populated on the SmartDashboard (SD) by Robot Builder. If you put the robot in Test Enabled, you will see the Live Window display. If you wish to get feedback from sensors or actuators in modes other than Test mode, you will need to send the desired feedback to the SmartDashboard manually. You can do this using calls such as
SmartDashboard.PutNumber(ValueIWantToDisplay) inside your Commands or Subsystems.

Q.We have a 2012 Classmate running 2012 Driver Station. Can it correctly interface with a 2013 imaged cRIO running a 2013 C++ WPILib robot program?

A.This is not a tested or recommended configuration. All team are recommended to test using the competition required version of the Driver Station software.

Q.I have an Axis 206 connected via a switch/LAN at IP 10.xx.yy.11. I can ping it and the cRIO from the Driver Station PC. Should I be able to see the camera image in the FRC PC Dashboard Camera Image "window" when enabled irrespective of what robot program is running?

Q.I ran the current Log File Viewer. I see a bunch of log files. I see nothing happen when I highlight and double click them. Just a FYI as I expect this is what you are in the process of fixing. Kind Regards. Kudos to FRC support team and the new Documentation system! Mark

A.Correct. The Log File Viewer included in the Kickoff release was still set up to read v0 of the Logs (created by the DS last year). The new Log File Viewer will read the new v1 logs as well as the new Event Logs which will provide team and volunteers with substantially more information when reviewing what state a robot was in at a particular time. Documentation will be added to the ScreenSteps site describing the new messages and the Log File Viewer when it is available.

Q.Driver Station - Diagnostics Tab - Messages The messages scroll out of the message area. Are they logged to a disk file? I have not studied the message that I have seen closely, but they seem somewhat cryptic which is no big deal, but if there is any documentation on error code and their meaning

A.The messages in the diagnostics tab are logged to the event log files in the Log Files folder used by the Driver Station. A Driver Station update that contains the new Log File Viewer to view these logs, and documentation regarding all of the new Warning messages will be coming very shortly.

Pneumatics

Q.how many pneumatic air tanks can the robot have in total

A.Rules questions, including questions on part legality must be submitted through the [FRC Game Q&A](#). There is no technical limit on the number of storage tanks you could include as part of the pneumatic circuit. Note, however, that as storage volume increases, so does fill time.

Robot Control System

Not Available

Hardware & Electrical

Q.Our camera was non-responsive out of the box. Did not establish network connection to either our laptop or a network switch. We tried doing the reset process and it did not appear to respond to that. Only activity that we can observe is that when the camera is when power is applied to the camera the PWR led on the back illuminates and stays solid until power is removed. How would we go about replacing this camera unit and are we able to send it back for an exchange?

A.If this camera was received via FIRSTChoice, please send an e-mail to frcparts@usfirst.org detailing the issue.

Q.Can the Digital Side Car relay outputs source at least 5 mA current to drive a custom circuit?

A.This information is available in the Digital Sidecar datasheet which can be found at the bottom of the [Kit of Parts Control System page](#).

Data & Connectivity

Q.Whenever I attempt to use the imaging tool to format our cRIO in safe mode the tool goes through the formatting stage and then it says "Rebooting..." and never stops. If I turn off the cRIO the imaging tool continues. After when I reconnect, often the imaging tool can no longer see the cRIO. If I look in MAX the cRIO's IP address has changed to 169.254. 62.215 and the subnet mask is 255.255.0.0, and MAX labels the cRIO as having inconsistent IP settings. Changing the IP address of the computer to 169.254.xx.yy both resolves the inconsistent IP settings and allows the imaging tool to see the cRIO again. What am I doing wrong?

A.FIRST's FRC Technical Help has transitioned back to the FIRST forums for the 2014 season: <http://forums.usfirst.org/forumdisplay.php?23-FIRST-Robotics-Competition>. The forums are much more conducive to a back and forth discussion often necessary to troubleshoot technical problems. Imaging instructions for the cRIO, including troubleshooting steps can be found here:

<http://wpilib.screenstepslive.com/s/3120/m/8559/l/89727-imaging-your-crio>. If you still need assistance, I would recommend contacting NI Support via the phone number found on the <http://ni.com/frc> page or posting in the forums linked from that page.

Q. So, my team has been trying to run our code on the cRio. After we set everything up for a wireless connection (with the d-link wireless bridge), we tried running the code, but we got a message that said that it couldn't connect with the target. We also tried running it through a direct communication to the cRio through an ethernet cable, but then a message showed up that said it couldn't connect with the target because it was running a different version of labview than the host computer. I know I have the right LabView version, though. Has anyone had the same problem or know of any solutions?

A. It sounds like you have installed the latest version of LV on the desktop, but have not updated the cRIO to have the new runtime. Please format your controller using the imaging tool.

Q. There is some confusion as to IP addresses and subnet masks. I see documentation stating to set the Subnet mask of the Driver Station to 255.0.0.0. I see the subnet mask of the cRIO and camera as 255.255.255.0. For the radio I think I saw its IP is 10.xx.yy.1, but I have also seen .9 with mask = ?

A. The subnet mask of the Driver Station must be set to 255.0.0.0 to communicate with FMS when on the field. As this setting will also work at home, it is the recommended configuration. All other components of the system should only be communicating on the same Class C subnet and should operate fine when set to 255.255.255.0. The D-Link radio is set to 10.XX.YY.1. The Driver Station uses .9 for the wireless NIC.

Q. On the main screen of the FRC Bridge Configuration Utility it states "DO NOT USE AT FRC EVENTS". Does this mean the utility shouldn't be used at an event or the bridge or the configuration should not be used?

A. Neither the FRC Bridge Configuration Utility, nor the configuration it loads on the radio should be used at Official FRC events. Teams will need to put the radio into Bridge mode and re-configure it using a programming station provided at the events (note that this program will look similar but not the same). The DAP-1522 RevB device itself absolutely can and must be used at events.

Robot Mechanical

Not Available

Quextit

Q. How often do you update your apps?

A. We usually do one update per month for each app. If we find any critical issues, we fix and update right away.

Supply Item

Q. Do you test on FireFox? The rules popups have trouble on 18.0.1 on a Mac. Sometimes some of the display is outside the window.

A. Thank you for bringing this to our attention. The positioning has been fixed.

Availability

Not Available

Clippard Instrument Lab

Not Available

National Instruments

Not Available

Hardware

Not Available

Software

Q.I just tried to get NetConsole working, but could not. I still need to check that my cRIO has the "allow" NetConsole box checked with the imaging tool. I have windows firewall off. Do I need a physical serial cable(null modem) cable connection? Or will it work thru an ethernet adapter?

A.You will not need a physical serial cable - although you could also get console out that way. The netconsole should work through your ethernet adapter- firewalls are the most common offender for this not working.

AndyMark Inc.

Not Available

Cal-Comp USA

Q.How can I get information about Cal-Comp Products.

A.You can check the Andy Mark category on this site.

Bimba Manufacturing

Not Available

Windriver

Not Available

Cypress Semiconductor

Q.Hello, I didn't find the HEX file needed.

A.Here is the answer - you need to get the 2009 file for ES2 devices:
Hi Patrick,

I just found the 2 revisions of the board and tested the FRC 2013 Driver Station Update 3.0.
<http://joule.ni.com/nidu/cds/view/p/id/2263/lang/en>

FRC_IO.2012.v3.hex loads successfully on the release silicon.
FRC_IO.2009.v3.hex loads successfully on the ES2 silicon.

Cheers,
-Joe

Please let me know if this resolves the issue ...

Q.When following the instructions in the "Getting Started with the 2013 FRC Control System", I was unable to flash the FRC firmware. I followed ALL troubleshooting steps provided. The Error Message was "ERROR!----> The hex file was built for silicon revision ES3, but the acquired device is revision **." The file name is "FRC_IO.2012.v3.hex" since we are a rookie team.

A.There are now two sets of PSoC boards in the KOP. When we first started donating the boards we had ES2 (engineering sample parts) on the board and now they are production parts (actually turns out they are identical parts - but not to the SW). The HEX file being used is an earlier one for those teams that had the kits in previous years. There should be another HEX file that targets the production parts. I will check with the engineer at NI who created the files to verify. In the meantime, see if there is another HEX file at or near the same location where the one that doesn't work is.

VyCategory

Not Available