Course Preparations

**Assessing and Exploiting Control Systems and IIoT**!

Welcome to the **A&ECS** course!

# **Receiving your Hardware Kits**

You should be receiving your hardware kits shortly. If you have received a tracking number, you should immediately verify your shipping address and keep track of the status of your shipment. Exact components included, shipment processes, and tracking numbers are handed differently based on the conference or organization sponsoring the training, and should have been indicated on your course registration pages.

Once you receive the kit, please verify that all the components look undamaged. If you see anything that looks broken, or do not receive the kit by 10 days prior to the course, please contact your instructor ASAP, providing pictures of the damaged component or an explanation of the problem. Just don’t plug in the PLC to your Windows machine until after you complete the setup steps below, or Windows will try to be smarter than you and install the wrong drivers. :-(

# **Course’s Private Discord Channel**

First off, we will be using Discord for virtual classroom chat. This will allow us to have a persistent virtual chat room before class begins, between class sessions, and long after class is oer. I plan on keeping our course's channel up and running indefinitely, and restricted to those who took this specific course run.

If you do not have a Discord account yet, please create one. Once you are logged into your Discord account, use the following link to join the ControlThings Discord server.

<https://discord.gg/CmDDsFK>

I recommend downloading the desktop version of Discord (available for Windows, Mac, and Linux) but you are welcome to use the web client if you prefer. There is no requirement to install the Discord desktop client. I also recommend that you run this on your host machine and not inside a VM.

Once you get into the Discord server, please right-click on your username on the right, and change your nickname to the same name you used to register for this class. This will allow us to match your name with your official course registration name. Please keep your nickname set to your course registered name until the class is over, then you are welcome to change your nickname to whatever you wish.

After you have done that, please click on your instructor's name and send them a direct message asking them to add you to the private course chat. This may take a day or two to complete, unless of course it is the morning of the course when we are guaranteed to be online.

# **Laptop or Desktop Setup Instructions**

You probably found this document by following the following link to the A&ECS Google Drive folder, but just in case, here is the URL to find the software you’ll need:

<https://goo.gl/2yFhPf>

If you have any problems downloading the ControlThings Platform OVA file, try clicking on it directly to initiate the download. It is a symlink in that folder, so trying to download a compressed ZIP including it will usually fail. Another option is to download the **same version** from <https://www.controlthings.io/platform>. If anyone gets any Google complaints of exceeding download or bandwidth limits, please notify me immediately.

The first part is getting some software installed on your host with Windows 10, or if you run Mac/Linux, a Windows 10 virtual machine that you provide yourself.

1. Copy the full **Velocio PLC** folder from the Google Drive download link provided above to your Windows 10 machine (host or VM)
2. Install **vBuilder** and **vFactory** from the **Velocio PLC** folder
3. Start **vBuilder** so it can install the needed drivers, answer **Yes** to the first prompt
4. Download and install the latest version of **Wireshark** from wireshark.org (or grab from the **Backup Software** folder), making sure during the install that you add the option install of **usbpcap**. If you have an older version of **usbpcap** installed (as in over a year ago) you may want to uninstall it before trying to install **Wireshark**.

That should be all we need installed on your Windows 10 machine. Now let's get the ControlThings Platform VM up and running. You can use VMware or VirtualBox for this. I provided you with the OVA file so it should import cleanly in either one. If you are new to virtual machines, I STRONGLY suggest downloading the latest version of VMware Workstation (Player or Pro) and using it, as you will run into fewer issues getting it properly configured. Player is free to use for non-commercial uses, and Pro you can use for a 30 day trial. Regardless of your choice between VMware or VirtualBox, please make sure you are using the latest version or one released in the last year. You WILL run into problems using older virtualization software.

1. Import the ControlThings Platform virtual machine with VMware or VirtualBox
2. Your VM should default to 2GB RAM, but please increase this to 4GB+ as long as it doesn’t exceed 50% of your total machine RAM
3. Add a soundcard to the ControlThings Platform VM and make sure it works
4. If you are using VirtualBox, you will need to install the **Oracle VM VirtualBox Extension Pack** and add a USB controller to the VM, preferably setting it to USB 3.0 assuming your machine has 3.0 ports
5. You don’t have to do this, but to give you a few extra features, you can install the guest tools for VMware or VirtualBox inside your VM once it is running. If you have never done this before, there are lots of tutorials and youtube videos showing you how to do this inside a Linux guest.

And that should be it. If you have any questions, please feel free to ask **@TAs** for help, which will ping the instructors and TAs.

# **Hardware Kit**

Until class starts, there is nothing you need to do with the devices in the kit, but feel free to play with any of the devices in advance of the course. The biggest things to be careful of are static shock, voltages/current levels when using the embedded devices, and never plugging in any radio device in without an antenna. We'll be walking you through the use of each component. Some of the devices are targets that we will be testing, other devices are tools we will use to do the tests. Some will be both targets and testing tools depending on the exercise.