Issues connecting to remote equipment in the OpenEngineering Laboratory

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Introduction

The OpenEngineering Lab uses a mix of technologies to provide a highly responsive connection between a user and equipment. To achieve this, we use WebRTC, a peer-to-peer protocol, for video and audio, and websockets for data connections and establishing the video link. However, not all systems and browsers support these technologies. Here we will address a few of the more common issues previous students have encountered. Please read through the whole of this document before starting to trouble shoot your connection issues. Also, make sure you read the information on connecting to and booking a slot in the materials on your module website.

Connection Check

We recommend regularly visiting the OEL video test landing page to ensure your equipment and network combination can successfully connect to the equipment:

The OpenEngineering Laboratory: OEL Video Test | The OpenSTEM Labs

or

https://learn5.open.ac.uk/go/t212_videotest_r60

This is especially important if you change any component in the system you use to connect, e.g. a new laptop, a different location, a new browser. The OEL video test booking system allows you to connect to a live video and audio feed from part of the OEL laboratory. Each time you enter a

booked session, the lab system conducts several connection checks (see Figure 1, below). If all the checks are successful you will continue through to the experiment.

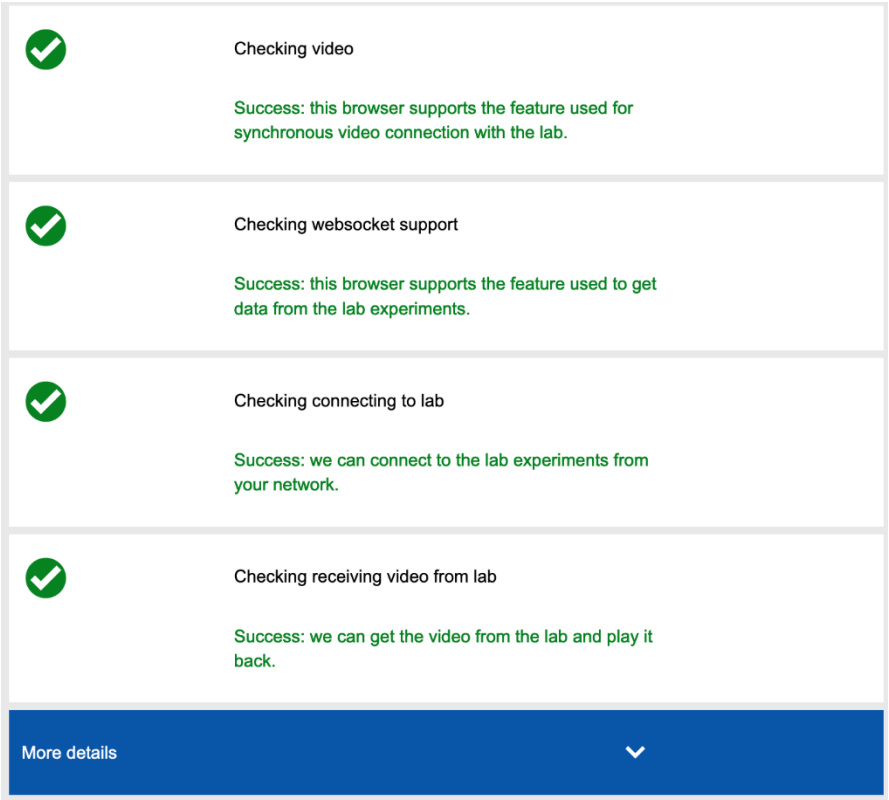


Figure 1 OEL connection checking screen

Connection issues

One or more of the connection checks fail

If you fail any connection checks, we suggest you try reloading the page, using the browser back and forward buttons, or log out of your session and then log back in. You may need to do this several times. Sometimes failures are short-lived due to connection issues between your machine and the lab as all the checks have a timeout. Finally, check that any antivirus or blocking software on your machine is not the cause. If you get a consistent result, then look to solve it using some of the tips below.

Checking video

The laboratory uses WebRTC as part of its technology suite to deliver video. Unfortunately, not all browsers support this protocol. We recommend you use the latest version of Chrome as this is what we test against. It is possible to use other browsers, for example Firefox, Opera and Microsoft Edge (version 79 and up), but we cannot guarantee the experience. If you have a corporate locked down machine, please contact your IT department to see if they can install Chrome on your machine.

The most common browsers that do not support WebRTC are Internet Explorer, Microsoft EdgeHTML, and Apple Safari. Also, iOS devices are not supported.

Checking websocket support

A failure at this stage is rare as all modern browsers support the websocket protocol. If you consistently get this, please check that you are using an up-to-date version of your browser or switch to Chrome.

Checking connection to the lab

This is also a rare failure as most networks will allow an HTTP connection to be made. If you are accessing the equipment from a secured network, then please discuss this with your IT team.

Checking receiving video from the lab

This is the most frequent cause of error reported to date. There are a few reasons why this might fail.

- Latency – the test times out after a predetermined period. If the lab system has not received a response, it will assume a failure. If you have a poor internet connection, then this may be a constant problem for you. There are several free resources available on the internet for checking the condition of your connection.
- Firewall – sometimes a firewall rule may block the ports required for WebRTC communications. This may be most noticeable in corporate or other secured environments where network rules prohibit such traffic. The first thing you should do is contact your IT team to determine if this is the case and request a change. Other examples include settings on public open wi-fi networks, hotel networks (sometimes the 'free' version is more restricted than a premium offering), telephone carrier rules, and using a proxy server or Virtual Private Network (VPN). You should also investigate settings on your own machine.

No live video when all the tests pass

System error

Sometimes, even though the connection should allow it, video does not load into the window. First, try clicking the browser back button and then the forward button; it may take several attempts. Next, try logging out of the experiment, clearing the browser cache and then logging back in. If this does not resolve the issue, try moving some of the controls to see if you get a data output. If you do, try other tips below. If not, it may mean that you are not connected to a piece of equipment (see below).

Browser developments

Browser vendors are increasingly concerned with privacy and preventing things such as nuisance advertisements playing. To do this, there may be a browser setting which blocks audio and/or video from auto-playing. You also might have loaded an extension which does the same.

There are several possible solutions to this.

The first is to check the browser and any extension settings and alter them if necessary. It is not recommended that you change universal settings: you should set site permissions in Chrome for https://osl1.open.ac.uk/ to 'Allow' for the Camera and Microphone rather than the default of 'Ask', which can block video and audio. This is immediately evident if you enter the experiment and get a grey blank screen where the video should be. To change the site permissions, (which needs to be done when you are connected to an experiment rather than the Video Test) click on the icon just before 'osl1' (see Figure 2, below), select Site settings, and change Camera and Microphone to 'Allow'.



Figure 2 Browser address bar

You will then receive a message that your browser page will need to be reloaded for these changes to take effect. You can always change these settings back to the default, in Chrome's Settings menu, if you change your mind.

The second solution, once the experiment has loaded, is to right-click on the video pane and select 'Show controls' from the contextual menu. This is possible at the time of writing but may be blocked in the future iterations of the lab to conform with best practice.

The third solution only applies to activities that have one video pane and a drop-down menu to switch between different views, for example the digital activity. These OEL applications use a single volume control for all video elements in a panel, so a scenario can arise where the volume is increased above zero by the user for the default video feed and then switches to another video feed. This can trigger the autoplay failure. We advise students to check all the video feeds work by switching between them before turning the volume up.

VPN

A feature of a VPN connection is to mask the users IP address by presenting a different IP address. For WebRTC to work, it requires that the IP addresses of both the user's and lab's computers can be established. If it is not possible to establish both addresses, then you will need to use a non-VPN solution. There are several possible levels where a VPN connection can be implemented: the operating system; the browser; the router, and by using a VPN service. If you are using a corporate computer, it may not be obvious that it is using a VPN connection. If necessary, contact your IT department for advice.

Equipment not available

There is a rare possibility that not enough pieces of equipment are available to fulfil the booking requests. We always have more pieces of equipment in the lab than booking slots available, but there is always the possibility this buffer is not sufficient to cover malfunctioning units. In such instances, an application window will load with no equipment attached.

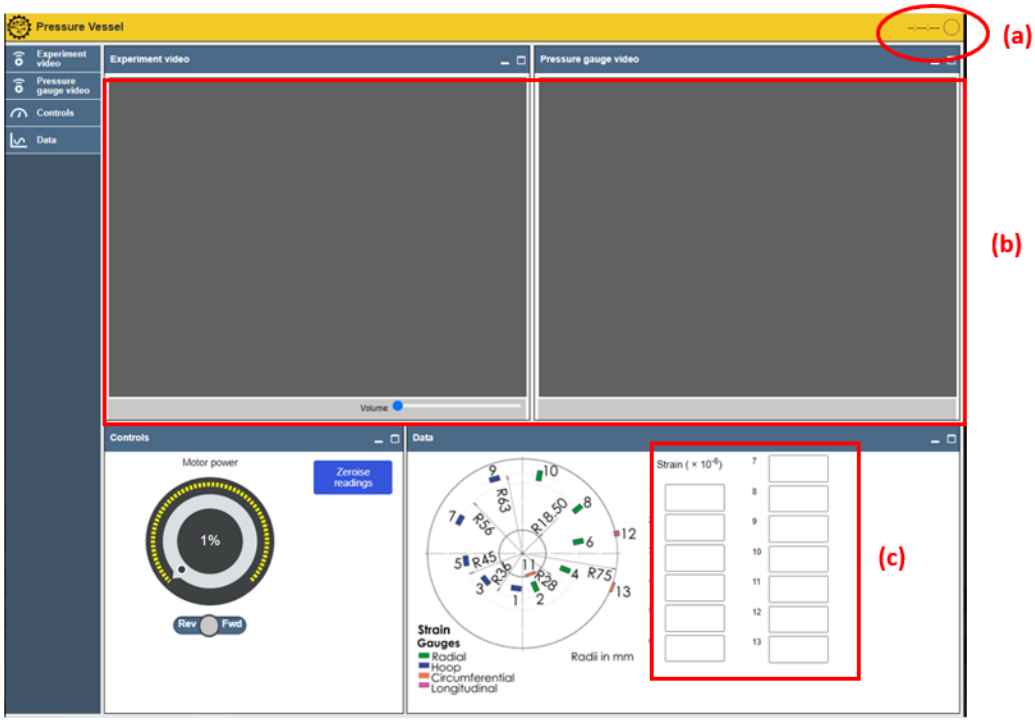


Figure 3 Equipment not available screen (Pressure Vessel) a) lack of countdown timer, b) no video feed and c) no data values

This is characterised by a) lack of countdown timer; b) no video feed; and c) no data values. In these instances, we can only apologise and ask you to re-book a later slot.

Getting help

If you continue to have problems with accessing the experiments after trying the tips above, then please post a message on your module forum where either a member of the team or a fellow student may be able to help.

You will appreciate there is a limit to the help we can give beyond general pointers as we cannot interrogate your machines or systems.