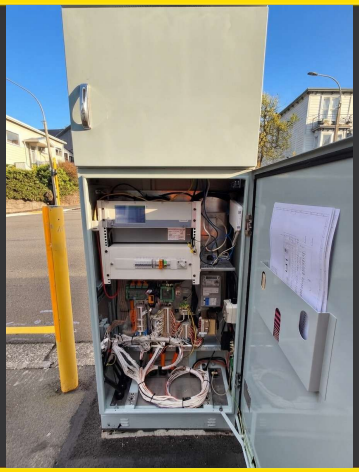
swarco

ITC-3 Controller Trial

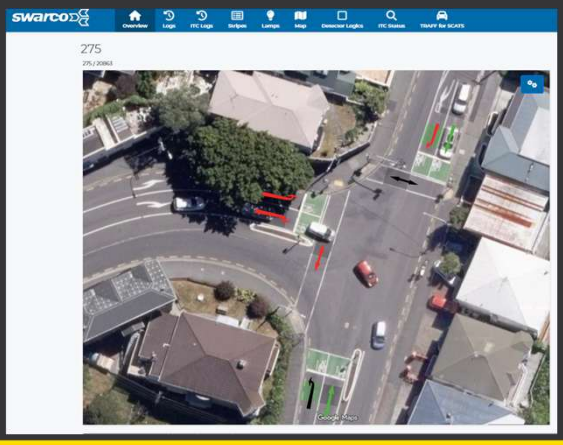


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Morning everyone.
Today I wanted to share a bit about Wellington City Council's trial of the SWARCO ITC-3 controller.
We've had one installed on the network since March this year, so I'll run through why we chose it, where we put it, how it's performed on SCATS, some of the issues we've come across, and what we're looking at doing next.

Unique features

- Can interface with any of the major traffic management systems.
- Native operation is fully movement-based.
- Built in touchscreen computer so no need for laptop or hand-held terminal.
- Includes remote access via web page when connected via network comms.
- Capacity to foster the implementation of smart detection – radars, LIDAR, etc.
- Compatible with Vivacity sensors.
- Capacity to use SWARCO Smart AI.



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So, before getting into the trial itself, I thought I'd touch on some of the more unique features of the ITC-3 that sets it apart from our traditional controller choices.

It can interface with pretty much any of the major traffic management systems - SCATS, SCOOT, STREAMS etc etc.

It's also natively movement-based rather than phase-based, which opens up some potential efficiencies when it comes to traffic flow with the extra flexibility.

The controller has a built-in touchscreen computer, which means you don't always need to drag a laptop out to site to make changes or check things.

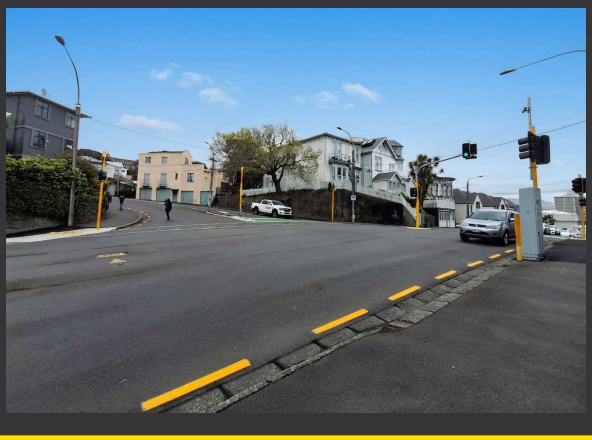
It also has web browser access when connected to network comms which is a must if you're using the native operation as this mode is not able to be monitored via SCATS at this stage. The web browser also has fully usable hand-held terminal display, lamp wattages, detector logics, logs, live operation and detector data that can be extracted.

And it's designed to work with newer detection technologies like radar, LiDAR and

Vivacity sensors, which is something we're becoming increasingly interested in as we look at smarter ways of managing intersections.

Picking a Location

- The Terrace/Salamanca Rd – one of the vital connections going into the CBD.
- 3-phase T-intersection.
- Bus route.
- University in the area.
- No coordination with other sites.
- No special logic.



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For the trial we selected The Terrace and Salamanca Road intersection.

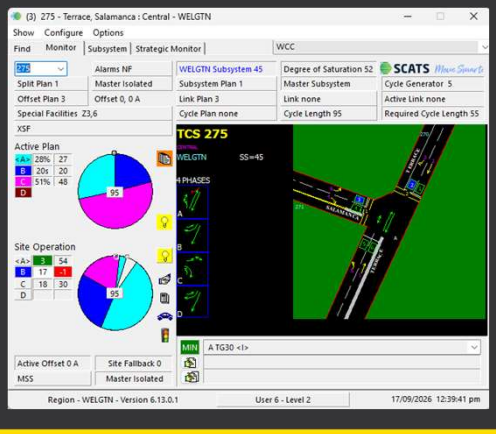
It's a busy intersection with a bit of everything going on, with general traffic, buses and the university nearby.

Importantly though, it's a relatively straightforward intersection from a control perspective. There is also no shared lanes which makes this site ideal for testing of the signal group phasing.

There's no coordination with surrounding sites and there's no special logic running, so it was a good site to trial a new controller without introducing too many other variables.

Operating on SCATS

- Converted the personality into a CONFIG.
- CONFIG was bench tested in the Downer Workshop for a week.
- SWARCO representative was on a video call when the controller was commissioned.
- Operation has been identical to the previously installed QTC controller.
- No immediate issues found.



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Because SCATS is our sole traffic management system, one of the key things we needed to know was how well the controller would integrate.

The first step was converting the personality into a CONFIG.

That CONFIG then spent about a week on the bench in the Downer workshop where we tested it before going anywhere near the field.

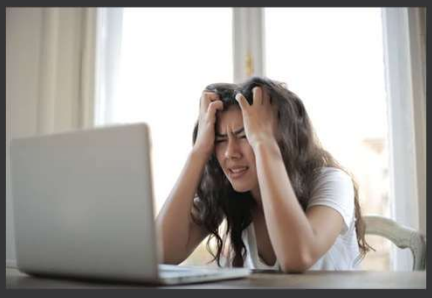
When it came time to commission the controller, SWARCO jumped on a video call with Downer to provide some support and make sure everything went smoothly.

To be honest, the commissioning itself was pretty uneventful, which is exactly what you want.

Since going live, the controller has behaved exactly like the QTC controller it replaced and we didn't see any immediate operational issues.

Pain Points

Issue	Details	Solution
Input Mapping doesn't work	Input mapping for roadworks or radar installation cannot be done through SCATS	Must use web browser interface
Had a recurring fault that reported FY but was stuck in a phase	- Breakdown in comms between the controller and TRAFF - Should have gone WD FY and then cleared automatically - Unable to reset remotely - Tech had to attend to reset logic	SWARCO came over from Australia, replicated the issue and found the CPU card was faulty



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Overall the trial has been successful, but there were a couple of pain points worth mentioning.

The first one is input mapping.

We found that input mapping doesn't work through SCATS. So if you're doing things like mapping dets for roadworks changes or installing radar detection, you're going to need to use the web browser interface instead.

Not a major issue once you know about it, but definitely something worth being aware of.

The second issue took a bit more investigation.

We had a recurring fault where the controller was reporting an flashing amber, but the site was actually stuck in a phase which as you can imagine caused a bit of chaos. We weren't able to clear the flashing amber and when we tried to remotely turn the site off and on, it went off, but wouldn't turn back on. So we ended up needing a technician to attend site to manually reset the logic.

At that point SWARCO came across from Australia and worked through the issue with us. After digging into it, they found there'd been a loss of communications between the controller and TRAFF. Some sort of network disturbance caused comms to run in a fallback mode between Traff and the controller, which is separate to the typical ST NC you have in SCATS.

The expectation was that it should have gone to watchdog flashing amber and then recovered automatically once communications came back.

Unfortunately that didn't happen.

While SWARCO were here, they were able to replicate the fault and eventually tracked it back to a faulty CPU card, which once replaced, resolved the problem.

What's next?

- Testing SWARCO's Native Operation. (movement-based instead of phase based)
- Rolling out more SWARCO ITC-3 controller upgrades.
- SWARCO is developing a hybrid mode so native op can be monitored on SCATS and SCATS flags can be read.
- Implement Vivacity sensors for multi-modal detection.
- Utilize SWARCO's Smart AI capability.



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So where do we go from here?

The next thing we're looking at is testing native operation.

At the moment the controller is running in a traditional SCATS environment, but we're interested in seeing what can be achieved when it operates in its native movement-based mode.

We're also looking at rolling out more ITC-3 upgrades as controller renewals arise.

Another development we're keeping an eye on is SWARCO's hybrid mode, which should allow native operation while still giving visibility through SCATS and we should be able to read flags from other sites, which will trigger different CONFIGS to operate based off what the flag is for.

For example, This intersection is on the detour route for a terrace tunnel closure, if the tunnel closes, another intersection will show an MSS bit that will be visible to the ITC-3 at this site, which it will then implement a CONFIG that has longer times for the movements along the detour route.

And finally, we're keen to start utilising our Vivacity sensors that already exist at this site, so we can explore some of the Smart AI capabilities that SWARCO is developing.



So that's been our experience with the ITC-3 so far.

Overall, the controller has integrated well with SCATS, performed as expected in day-to-day operation, and given us some confidence that there's potential for more advanced functionality in the future.

Thanks for listening