

Success Story

The World's Most Advanced Sandwich Toaster

TAFE Queensland SkillsTech

Location: Queensland, Australia

Completion: 2017

Industry: Other (Education)

For over 130 years vocational education, including specialist trade and technical training, has been conducted in Brisbane by what is now TAFE Queensland. With over seven million students having passed through the system since its inception in 1882, TAFE Queensland provides a consistently high level of skills to a wide range of industries in the region.

The TAFE Queensland SkillsTech faculty offer a range of courses to electrical and instrument trade technicians working in the process and manufacturing industries. Their goal is to ensure their students are equipped with the latest and most applicable skills required to meet the demands of industries in the region. Yet with technology advancing at an unprecedented rate, keeping the training up to date is a challenge. TAFE SkillsTech have therefore partnered with key vendors to ensure their technical trade courses remain current. In doing so, they have forged a relationship with Yokogawa Australia which stretches back over 30 years, providing both distributed control system (DCS) and instrumentation technologies.



The relationship began in the mid-1980's with Yokogawa supplying a Micro-XL system to provide instrument technicians with a modern DCS to hone their operations and maintenance skills. As time passed and technology advanced, the system was updated to CENTUM CS 3000 in the 90's, then more recently to CENTUM VP R6 in 2017, with Yokogawa pressure and temperature transmitters also connected.

The facility, which relocated to Eagle Farm in 2007, is equipped with 4 x field control stations (FCS). They also have 9 x engineering workstations, allowing students to not only develop their programming and tuning skills for PID control, ratio, cascade and feedforward control, but also their own projects connected to a live working plant. The course has been designed to provide students with the framework for a systematic approach when forging a career as an instrument technician.

The course is 14 weeks in length, with first seven weeks followed by 12 months' on-site work experience, then another 7 weeks back at TAFE. With a maximum of 10-12 students per intake and running six times per year, a total of 60-70 students pass through their doors each year.

Course teacher Glen McMurtrie comments *"We look to provide the highest levels of technical training to our students, maintaining a high degree of relevance to their day to day activities for when they are back on site. We also want to make the course as practical as possible which is why we use the DCS for a range of applications, especially in the areas of pressure, level, flow and temperature measurement."*

TAFE SkillsTech have several working demonstration rigs linked back to the CENTUM system. Pressure level and flow are measured and controlled by mimicking the movement of liquids through a scaled down process plant with tanks, valves, and pumps. When it gets to temperature loops however, they are a little more creative.



"We get the students to program and test temperature loops using a domestic sandwich toaster. Temperature probes are inserted inside the sandwich and the heating element controlled by the DCS using a traditional feedback loop. Set points are adjusted on the operator workstation as the heating elements set to work toasting the sandwich, ensuring its heated all the way through and adjusting still further to ensure the toast achieves the desired color. The students have great fun, yet take it very seriously especially in cases where their lunch is the content of the sandwich press!"

As another level of creativity, the students also get to control the temperature of a domestic mini-oven (complete with imitation emissions stack for realism), connected to its own dedicated FCS. Once again temperature probes are inserted through the side of the oven for readings as the control element is monitored to achieve exact temperatures.

"As much as there is a serious side to the course, applications like this live in the memory of the students long after they have graduated. It's a great way of embedding practical knowledge into long-term memory and reiterates the belief that learning should not only be practical, ongoing and relevant, but it should also be fun. With our scaled down process plant, it also helps that the majority of the students use Yokogawa's CENTUM DCS in their daily work, so these are practical skills which are immediately useful."



Yokogawa Australia & New Zealand are committed to supporting educational institutions in the training and development of the highest skill levels with engineers and technicians.

Our support of Queensland TAFE SkillsTech is an enduring example of how vendors play an important role in ensuring educational institutions have the tools to continuously deliver practical and quality courses. This is especially important in the current environment where technology is advancing at an unprecedented rate and site engineers and technicians have to be multi-skilled to meets the needs of the plant.

For more Information and Contact

[CENTUM VP \(DCS\)](#)

[Temperature transmitters](#)

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