

Free Library of Real Industrial Control Applications

Download and run them on XC05Edge – or inspect the complete control schemes free of charge with FirstGraph

Introduction

The applications are available free of charge and are based on solutions used in real industrial projects. This library contains industrial control applications developed for the XC05Edge or its predecessors, XC01, XC02 and XC03. The purpose is to make our solutions available to SMEs and process engineers for use in their own installations, including practical examples of how advanced functions such as adaptive control, AI and simulation can be integrated into automation applications.

The applications presented here can be loaded into XC05Edge and used as templates, either as individual programs or as complete applications. The files are the latest versions saved by the engineer at commissioning. They must therefore be adapted to the specific installation, especially regarding I/O connections and clocking.

Looking for another application?

If you have a process or machine you are interested in, contact us. We will check our earlier industrial projects for similar applications and, where possible, prepare and add the solution to this library.

For users without an XC05Edge unit

The applications can still be opened in FirstGraph for inspection. The applications are built as graphical control schemes where modules are connected to each other and should therefore be understandable to most control engineers without special training.

How to use the files

If you have an XC05Edge unit

- Download the selected application ZIP file and unzip it on your computer.
- Open the included .mcd file in FirstGraph and download it to XC05Edge in the normal way to start editing and running.

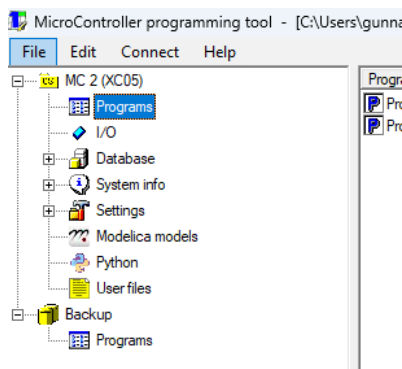
If you only want to inspect an application

- Download the FirstGraph installer, unzip it and install FirstGraph on your laptop.
- Download the selected application ZIP file and unzip it on your computer.

- Open the included .mcd file in FirstGraph using “Open project”.
- Click BUP to display the backup version of the application structure.
- Click on the application program you want to investigate.
- Use the “Scale” property and select 100-160 to change the graphical display.
- Use right click on the drawing to zoom in/zoom out a chosen area.

Downloads

FirstGraph installer



The package can be used to load the applications below or to inspect the solutions if you do not have an XC05Edge unit.

Link: [Download FirstGraph installer ZIP](#)

MPC control of a residential building with Python



We have completed a six-month field test of model predictive control (MPC) for optimizing space heating in residential apartments. The field test was done as a part of the DISTRHEAT research project together with MDU which is responsible for the python script for the MPC. The XC05Edge controller automatically adjusted the heating based on outdoor conditions and daily weather forecasts retrieved from SMHI, ensuring comfortable indoor temperatures with reduced energy use. The project demonstrates that advanced MPC with online model adaptation can be reliably

executed in XC05Edge and integrated seamlessly with existing heating systems and external weather forecasts.

Link: [Download MPC control of a residential building ZIP](#)

Adaptive thickness control in cold rolling



With our adaptive controllers, variations in strip properties and mill mechanics are automatically compensated during operation. This has reduced thickness deviations by 50–75%, resulting in a yield improvement of 5–10% and much simpler commissioning. The XC05Edge unit handling thickness control communicates with another XC05Edge unit handling hydraulic position control:

Adaptive thickness control:

Link: [Download cold rolling thickness control ZIP](#)

Position control of hydraulics:

Link: [Download two-sided position control ZIP](#)

Adaptive control in district heating



We have extensive experience in district heating, with installations across production, distribution and auxiliary systems – from oil, biofuel and electric boilers and heat pumps to booster and pump stations, hot-water centrals and renewable plants such as biogas and small hydropower. Our adaptive control solutions have been running in several plants for more than 15 years without any

need for retuning. Key benefits: more efficient and stable energy production, reduced maintenance and lower CO₂ emission.

The following application shows adaptive control in a large Boiler including all subsystems.

Link: [Download adaptive boiler control in district heating](#)

Education and training with Modelica



XC05Edge is the ideal platform for research and education. You can build and run advanced simulation models using Modelica. Below we give a simple XC05Edge application for training students in control theory. It uses a 2nd order dynamical system made in Modelica running in real time. The student selects delay, time constants, non-minimum phase and different types of disturbances in a Scada interface.

Link: [Download education and training ZIP](#)