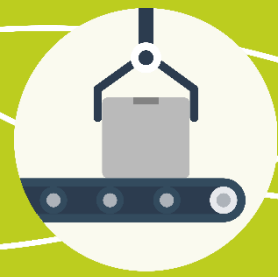


HARDWARE
DESIGN



SOFTWARE
DEVELOPMENT



MANUFACTURING
SERVICES

Internship opportunities

2019-2020

General Information

Why is an internship valuable for you?

In the first instance, an internship needs to be worthwhile for you, the student! Everyone deserves the opportunity to participate in an internship that is captivating and educational, in order to receive a **hands-on work experience**.

This will help you obtain a better **insight in your chosen field of study** and the possible **career paths** that come with it. You will not only be able to gain and **improve your skills**, but you can also interact with people who practice this profession on a daily basis. They will have the answers to many of your questions and are able to help you **discover your strengths and interests**.



Why consider an internship at PsiControl?

At PsiControl, we believe that we can help you and not the other way around. We will **help you define your subject**, by talking about your interests and aligning them with our expertise. Hence, we are able to offer you an internship that will suit you, one that you can be **passionate** about.

In addition, interns are part of our team and have tasks that closely relate to our ongoing projects. A **personal coach** will guide you every step of the way with a view to both realizing the internship goals and optimizing your experience.

What does PsiControl do?

PsiControl takes care of the design, development and production of custom-made electronics, human-machine interfaces and touch devices. To facilitate this, we have an **R&D and prototyping** department in Ypres (Belgium) and **procurement, production and service activities** at our branches in Belgium and Romania.

Our R&D department consists of **several teams** that undertake tasks such as analog and digital electronics design, writing embedded and application software, product design, environmental testing and development of reliable production tests with the goal of increasing quality.

You can find more information about PsiControl by visiting www.psicontrol.com.



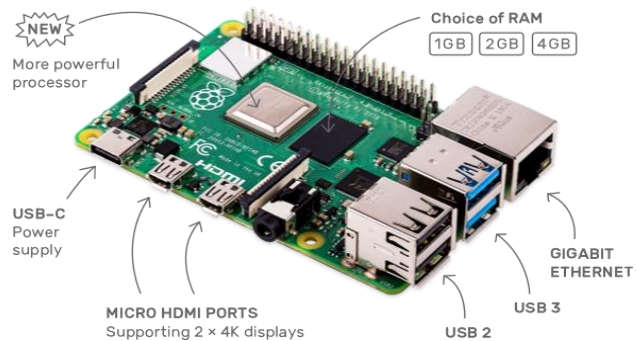
How can I apply for an internship?

There are two ways to apply for our internships. Firstly, you can contact us by e-mail or telephone to **set up a meeting in which you can tell us about your interests**. We have listed in this folder some topics that are related to our activities and which you can use as a **guideline**. With this information, we can propose a suitable internship subject for you!

Contact us via jobs@psicontrol.com

A second option is to apply for one of the **predefined subjects** outlined in this folder!

To show our **appreciation for your invested time and effort** in the project, we will not let you leave empty-handed. We hope you will enjoy a **Raspberry-Pi** as a parting gift to further explore your newly acquired skills!



PsiControl Research Fields



We have listed a number of topics and skills related to the PsiControl activities. You can review these themes to ascertain whether they align with your interests and, if so, come have a chat with us! Together we can **define your ideal internship subject**.

HUMAN-MACHINE INTERFACES
Capacitive Touch Interface Display Integration Sensors
Graphical User Interfaces Applications in Qt / C++ / C# TouchGFX / Embedded Wizard
Mechanical Product Design 3D-Printing & Prototyping Materials Engineering

WIRELESS CONNECTIVITY
RF design Antenna Circuits
Internet of Things Bluetooth & Wi-Fi TCP/IP Stacks Mesh Networking

DESIGN & COMPLIANCE TESTING
Immunity Radiation Safety
EMC Climate Tests Circuit Verification

POWER

Consumption Monitoring
Low Power Analog Design
Input-output Control
Battery

FPGA

State-Machines / **VHDL**
Test Bench / Real-time
ModelSim / Tcl



APPLICATIONS

Web Integration
GUI
Database Management

.NET / C#
Angular Js
SQL
Qt

MOTOR CONTROL

Control of **Stepper Motors**
Analog Driver Design

Feedback System
Control Technics

LINUX

A9-Processor Platform
Multicore
High Performance Applications

Networking Capabilities
Yocto / Python
Raspberry Pi / BeagleBone

Testimonials



” **Alexander Cornelissen & Jarne Wille**
Electronics-ICT / Kortrijk

During our internship, we investigated several stepper motor drivers that will be used on a Picanol weaving machine. Our coach, Niels was really supportive and always ready to answer our questions. We had a desk right in the middle of the PsiControl colleagues and were part of an ongoing project. We were also invited to join in with all of the social activities, such as after-work drinks and sports. This really helped us feel part of the team.

Furthermore, we appreciated the flexible working hours, and the fact we could even extend our internship to a summer job!

” **Tom Lierman**
Electronics-ICT / Ghent

For a period of five weeks, I was part of a project involving the PsiControl Embedded Software team, writing a protocol analyzer tool.

There is a pleasant and friendly atmosphere in the workplace and everyone was ready to help out and answer all of my questions. For me, it was the perfect place for my first work experience!



Proposed Subjects



The following section contains a few **examples of internships** you can undertake at PsiControl. If you are interested in any them, let us know!

Is your preferred subject not listed here? Don't worry - we can still do our very best to provide you with an internship that is perfect for you.

VISUALIZATION ON EMBEDDED DEVICES	8
DESIGN OF NEURAL NETWORK FOR SLIDER ALGORITHM	9
STUDY AND TESTING ON SUB-1GHZ RF TRANSCEIVERS	10
XYZ-TABLE AUTOMATION FOR CAPACITIVE TOUCH DURATION TEST	11
NEAR FIELD COMMUNICATION RESEARCH	12
DESIGN FSB SIMULATION BOARD	13
DEVELOP A DYNAMIC AND EASY TO USE STOCK MANAGEMENT SYSTEM.....	14





VISUALIZATION ON EMBEDDED DEVICES

Description

The **touch revolution** is still in progress. While many people are used to smartphone touch capabilities, old clunky interfaces (e.g. thermostats) remain widespread.

The challenge is now to bring touch to these **small controller interfaces**. To enable this, we often use the TouchGFX graphical library.

Your task

- Prototype and **interface on our 4.3"** touch platform
- Investigate and demonstrate the capabilities of **TouchGFX** library

What will you learn?

- TouchGFX
- C++
- Embedded software



Contact



For more information, please contact Filip Deniere:
e-mail filip.deniere@psicontrol.com or Tel. +32 57 409608



DESIGN OF NEURAL NETWORK FOR SLIDER ALGORITHM

Description

In many projects, touch sliders are used to get input from the user. To calculate the position of a touch on the slider, complex third-party algorithms are used. Since these algorithms often lead to sub-optimal results, it is worth the effort to investigate alternative approaches like neural networks. Thanks to the increasing performances of microcontrollers, it is possible to transfer a trained neural network to a microcontroller.

Your task

- **Design a neural network** that predicts the position on a slider
- Transfer the **trained network** to one of our controllers
- **Compare the results** with currently used algorithm

What will you learn?

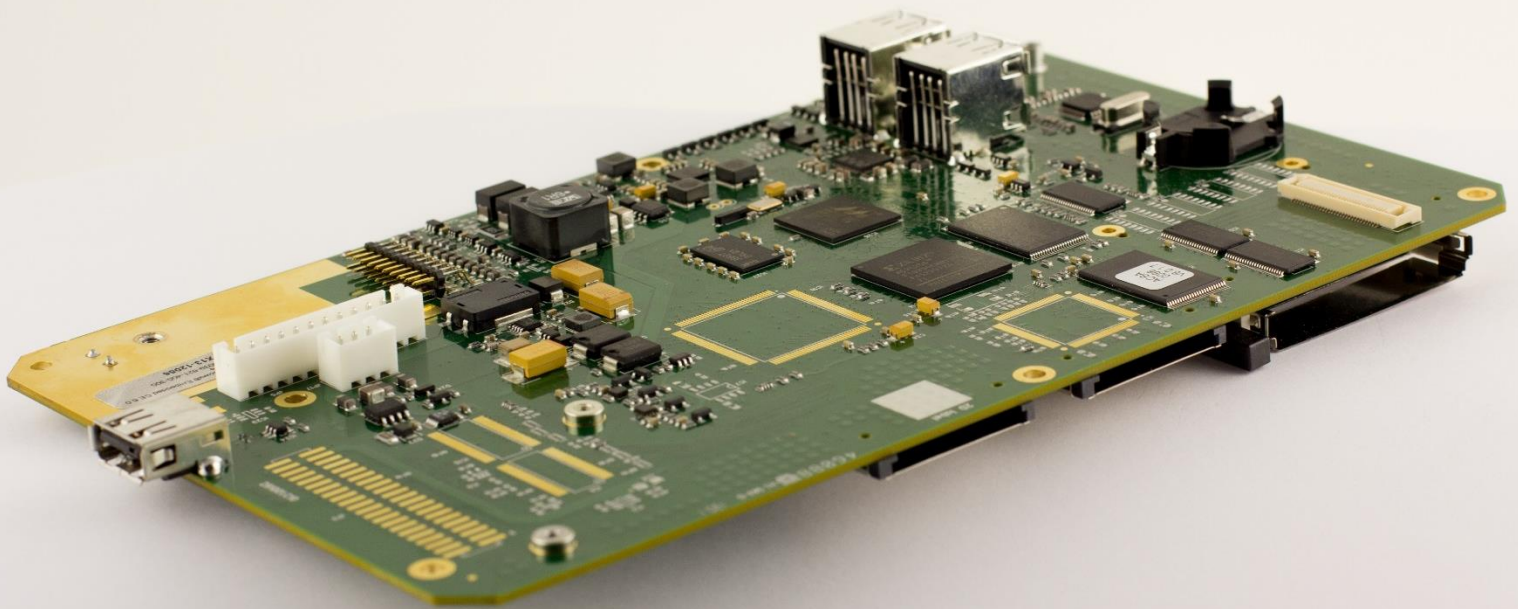
- Machine Learning
- Neural Networks
- C / C++
- Python, Keras, TensorFlow



Contact



For more information, please contact Mattijs Baert:
e-mail mattijs.baert@psicontrol.com or Tel. +32 57 409691



STUDY AND TESTING ON SUB-1GHZ RF TRANSCEIVERS

Description

New RF-transceivers become available on the market, so it is crucial to evaluate and compare them against our existing solutions. A market study can map the available transceivers for cost, quality and backward compatibility on current PsiControl products.

If tests on development kits prove that a transceiver is a valid solution for future products, an existing design can be redesigned and for further evaluation.

Your task

- Perform a **market study** of RF transceivers
- Execute tests on **development kits**
- Set up communication between different transceivers
- **Redesign** a board with a new chip

What will you learn?

- Analog hardware
- RF-design (868MHz)
- Embedded software
- Altium



Contact



For more information, please contact Wouter Baert:
e-mail wouter.baert@psicontrol.com or Tel. +32 57 409656



XYZ-TABLE AUTOMATION FOR CAPACITIVE TOUCH DURATION TEST

Description

To evaluate **the robustness of a capacitive touch implementation**, an automated long-term test setup is needed to monitor the touch behavior. A capacitive touch finger is moved onto the touch key, while a **monitoring device** checks and logs the status of the button. This process will be repeated numerous times and that is why an **automated setup** is required.

Your task

- Use the G-Code to drive the **XYZ-table**
- Implement a **monitoring and logging** software to evaluate the touch status of the keys
- **Design** the placeholders for the units on the XYZ table (3D printing)

What will you learn?

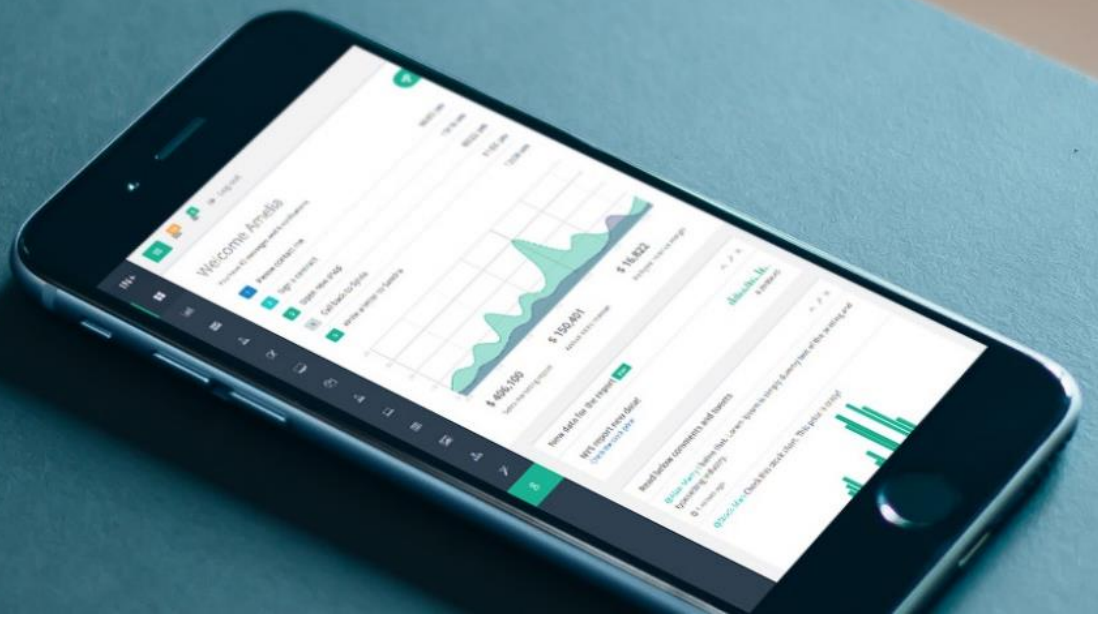
- Capacitive Touch
- XYZ-table / G-code
- Python
- Mechanical design



Contact



For more information, please contact Wouter Baert:
e-mail wouter.baert@psicontrol.com or Tel. +32 57 409656



NEAR FIELD COMMUNICATION RESEARCH

Description

Our current Near-Field Communication (NFC) solutions are either too hard to implement in small controllers or are more suitable for a high-level Linux integration. We are looking for an intermediate solution that can be used in different environments and applications.

Therefore, an in-depth study should be executed to compare newest NFC transceiver solutions and choose a suitable candidate for a dedicated prototype.

Your task

- Evaluate new NFC transceivers
- Design **hardware** for the top choices
- Antenna **tuning**
- Implement the system in our test platform

What will you learn?

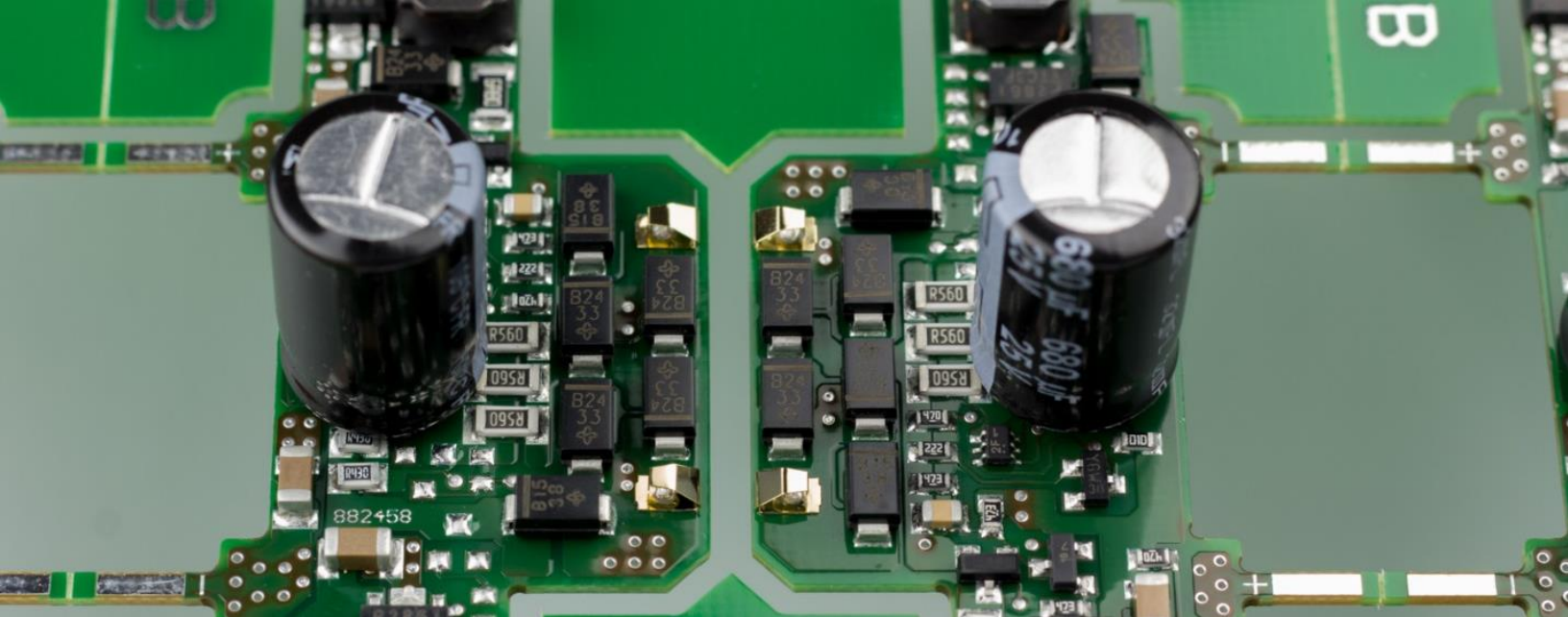
- NFC
- Analog Hardware
- PCB-design
- C/C++



Contact



For more information, please contact Jonas Geldof:
e-mail jonas.geldof@psicontrol.com or Tel. +32 57 409658



DESIGN FSB SIMULATION BOARD

Description

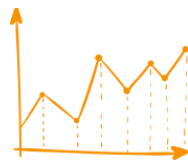
A wide range of boards, used in the control box of a Picanol weaving machine, are controlled by the processor board over a fast serial communication (Fast Serial Bus or FSB). To perform measurements or functional tests, a complex setup with master and bus board is now needed. To have a more comfortable access to the feature board, a board can be designed that replaces the master and the bus board. This solution would reduce the cost of and the needed space for the test setup.

Your task

- Design a board that replaces the master and the bus board
- Develop driver software for the processor and the FPGA
- Develop an easy to use User Interface that controls the test board

What will you learn?

- Micro Processor / FPGA
- PCB-Design
- C# / Python / VHDL



Contact



For more information, please contact Thomas Soetens:
e-mail thomas.soetens@psicontrol.com or Tel. +32 57 222317



DEVELOP A DYNAMIC AND EASY TO USE STOCK MANAGEMENT SYSTEM

Description

As a company we work on countless projects at once. Some projects need to be stored away and await further procedural advancements in order to be used again, or more simple: some of our tools aren't needed on a daily basis so we store them as well. Unfortunately our space is limited, we save lots of useless stuff and last but not least: things tend to get lost, so we want to find our stuff back efficiently when needed!

Your task

- Develop a **software platform** that keeps track of the contents of the warehouse
- Design an easy **user tool** that allows to enter new information and includes search functions

What will you learn?

- Application software
- User interfacing
- C# / Java

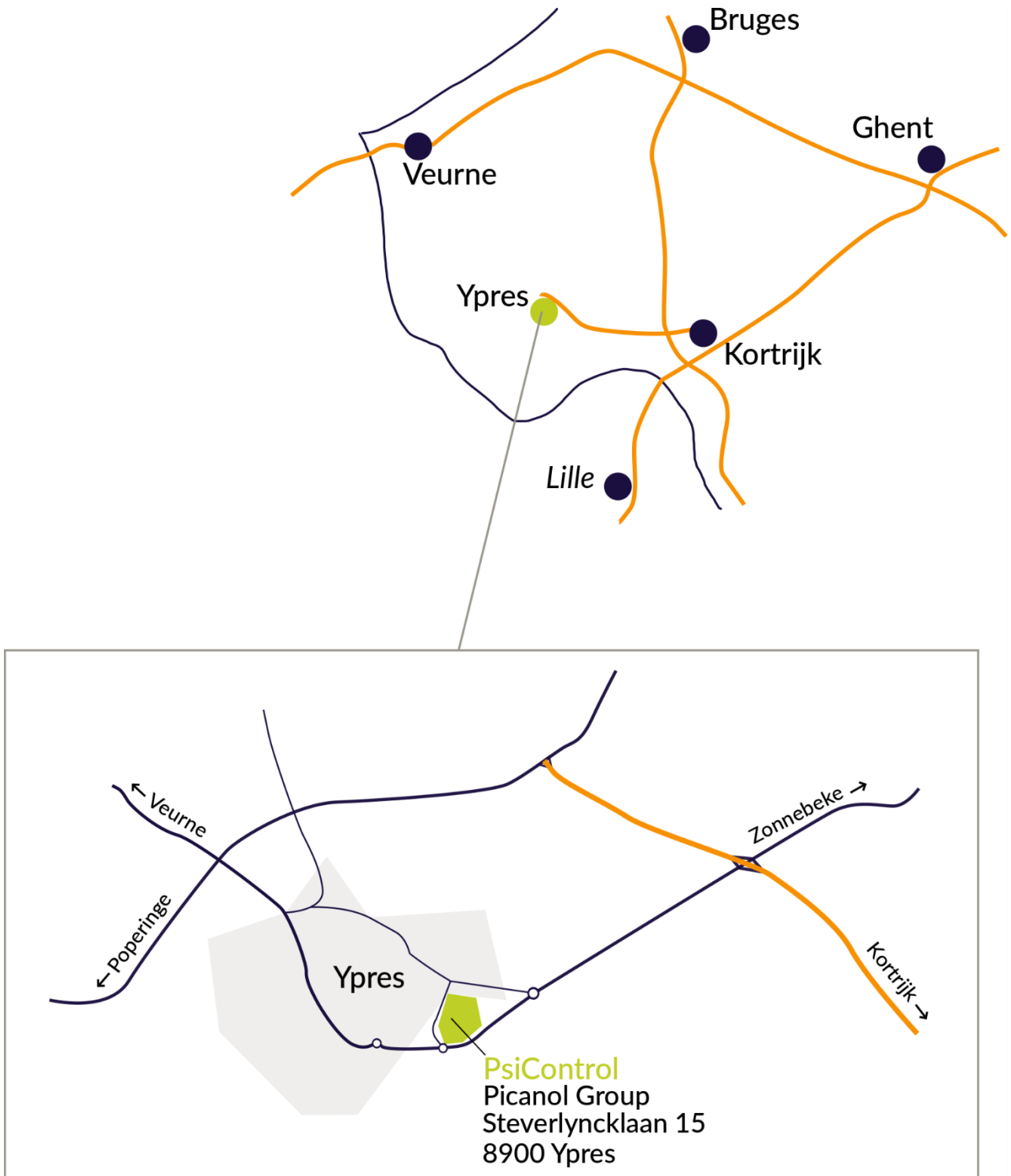


Contact



For more information, please contact Thomas Soetens:
e-mail thomas.soetens@psicontrol.com or Tel. +32 57 222317

Location



Wij zoeken **nieuwe collega's**! Kom jij ons team versterken?
We are looking for **new colleagues**! Will you join our team?



+32 (0) 57 222 111 // jobs@psicontrol.com // www.psicontrol.com



Follow us on



Steverlyncklaan 15, 8900 Ieper | +32 57 222 111 | www.psicontrol.com