FORTecH Software

Our Services

UNIT TEST FRAMEWORK FOR C AND C++

In the software development process, unit tests are now standard. With their help, the defects of individual modules are reduced and the subsequent integration is simplified. Unit tests enable more intense coverage of code paths in a unit under test not achievable by system testing.

Since the publication of the first frameworks, FORTecH has been using unit tests in its own development process. Due to the large diversity of target platforms in the embedded environment, we rely on our proprietary, simple and pragmatic framework for C and C++, which is inspired on the concepts of CppUnit.

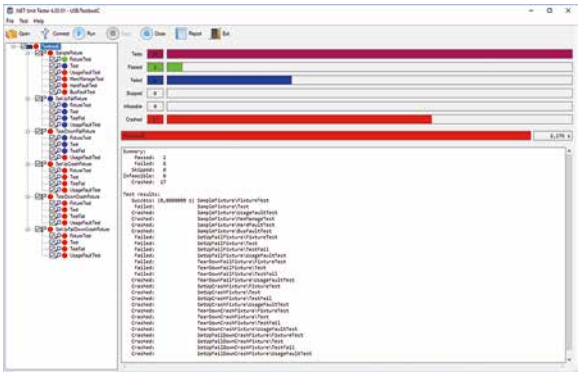
```
static void FilterTest1()
{
    uint16_t resultLength;
    float *resultData;
    uint8_t windowWidth = 3;
    float expectedData[] = {1.833, 2.5, 2.6, 2.866, 2.366, 2.3 };
    enum EResult result = FilterData(windowWidth, &resultData, &resultLength);

    // filter should deliver 6 result values
    AssertEqual(Success, result);
    AssertEqual(resultLength, 6);

    for (int i = 0; i < 6; i++)
    {   // check averaged values using epsilon of 0.001
        Assert(fabs(resultData[i] - expectedData[i]) < 0.001);
    }
}
```

In contrast to complex integrated test systems, we believe that testability should be part of the design. Modules use interfaces that allow for isolated tests. This allows the product code for C and C++ to be tested in static libraries that can be linked unmodified into the product after passing all tests. Error sources such as using different compiler options are thus avoided. Test results are generated in a JUnit-compatible format allowing for easy continuous integration in systems such as Jenkins/Hudson.

On more powerful platforms with an operating system and shell functionality, such as Windows Embedded Compact, we typically use scripted deployment and result transfer.



For small microcontroller applications, for example based on the ARM-Cortex M0...M4, the test control and evaluation are shifted to the development machine. Only the code to be tested, the test cases and a minimalistic server are deployed to the microcontroller. The interface used for the communication depends on the resources of the target system (USB, CAN, LIN...) and can be adapted. The development computer controls the test execution via a graphical interface or command line. Development environment and test control work in parallel so that the targeted execution of individual unit tests in the debugger is possible.

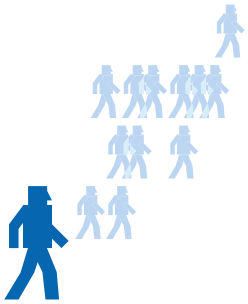
We are happy to assist in adapting our tools to customer specific development enviroments. We are pleased to support our customers in integrating unit testing into their platform. Please contact us for further information.

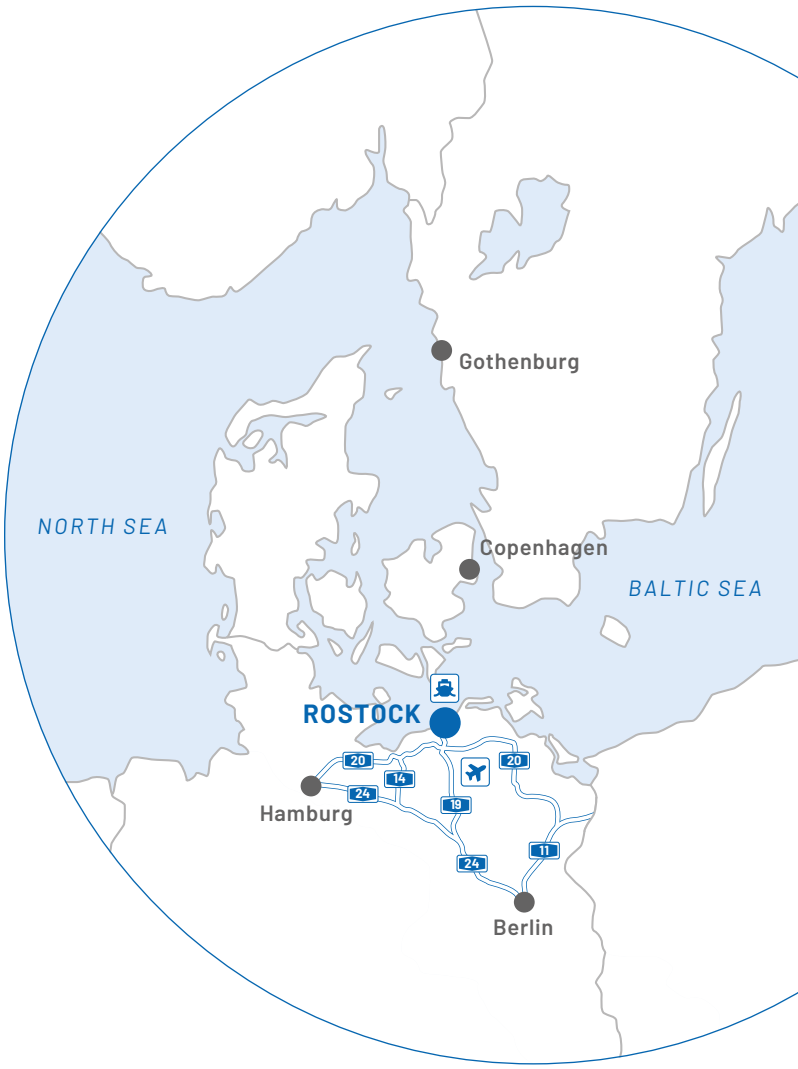
Our Company

FORTECH SOFTWARE GMBH

At a Glance

- Delivering individual software solutions since 1990
- Highly qualified team of computer scientists, electrical engineers and physicists
- ISO 9001 compliant quality management system





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