



SAFETY  
NONSTOP

TTK4175 - Instrumentation Systems  
**HIMA**

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Group 05

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# 1 HIMA Hardware (H51q-HS)

The first part of lab was to become more familiar with the HIMA Programmable Electronic System (PES) hardware. The purpose of such systems is to increase safety in industrial processes. As well to an overall reduction of the system price, engineering costs, maintenance and commissioning costs.

## 1.1 What is HIMA PES

The HIMA PES mainly consists of the H41q and H51q system families. Both system families are based on the same hardware and software, and they are the 3rd generation of the field-proven HIMA PES to control preferably process engineering plants.

## 1.2 What is Planar4

Planar4 is the only safety system in the world which can be used up to SIL4 in accordance with IEC 61508. Planar4 is the system of choice for automation processes involving extremely high risks to people, machines and the environment



Figure 1: Planar4 System

## 2 HIMA Software (ELOP II-NT)

The second part of the lab was used to become more familiar with the ELOP II-NT software and design a simple program, which gave a quick glimpse of the powerful software.

### 2.1 Tutorial and modules

Configuring the system was easy thanks to the guide provided, where the logic entry was preformed by simple Drag Drop from the standard libraries.

The input module was recognized to be F3236 rack 2 position 1 and 2. Output module F3330 rack 2, position 4 and 5.

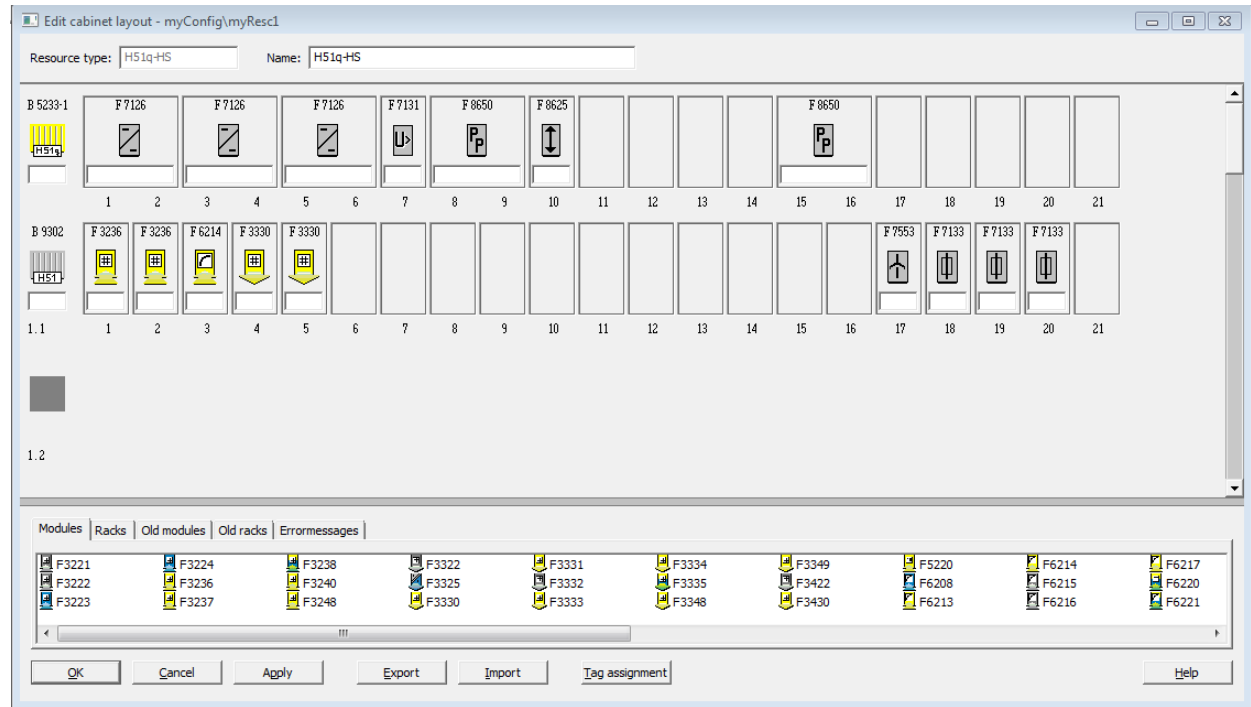


Figure 2: Cabinet Layout

The test program was to create a simple AND logic which turned on the LED when both inputs were ON, and OFF when one of them was low.

## 2.2 What is BUSCOM

The serial communication between HIMA PES and external systems is called BUSCOM, it is used for configuration and programming.

## 2.3 2oo3 analog voting

The 2oo3 analog voting was created by creating multiple sub-blocks and connecting them together to achieve the wanted result. The Figure below shows the final result, this logic was tested in both offline mode, using OLT fields and online mode using the outout module to turn the light diodes on/off.

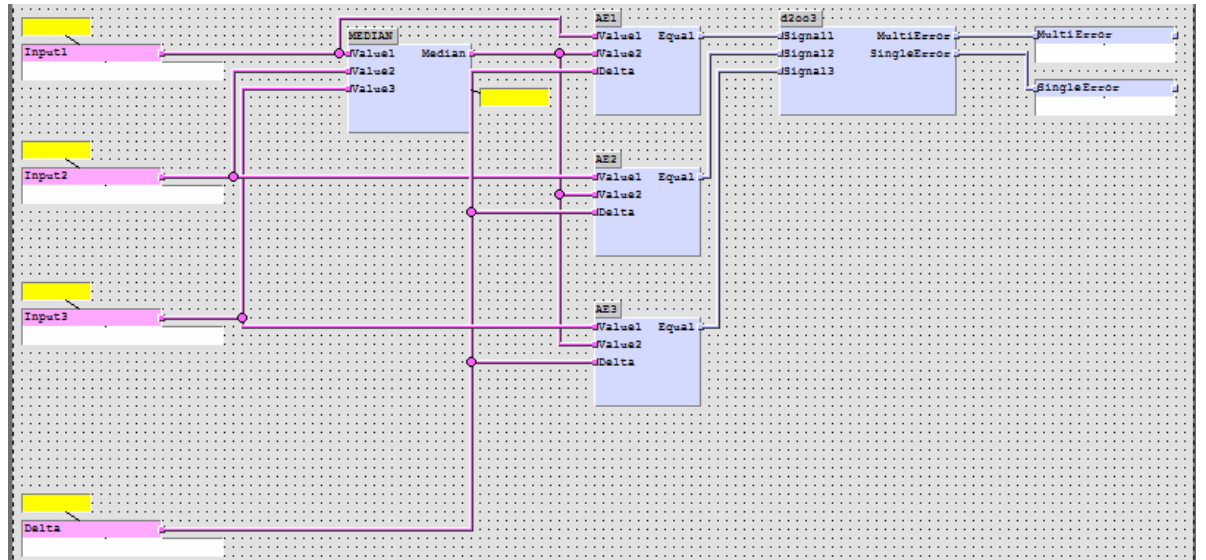


Figure 3: 2oo3 Analog Voting

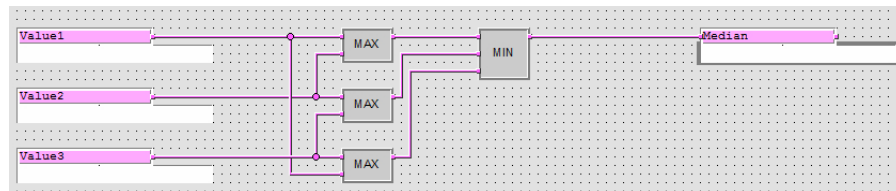


Figure 4: Median Block

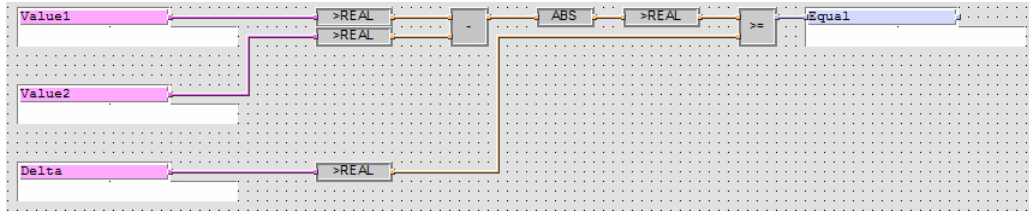


Figure 5: Almost Equal Block

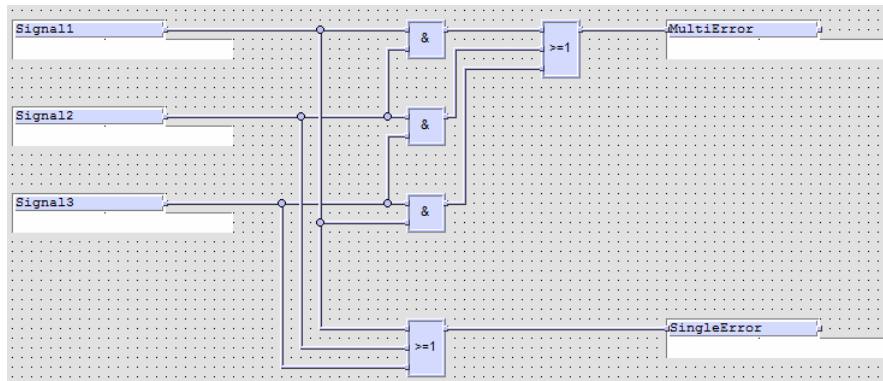


Figure 6: d2oo3 Block

## 2.4 HA-RTE-3 and a2oo3

In the last part, the already created logic was combined with the HA-RTE-3 module, the figure below shows the connection between the modules.



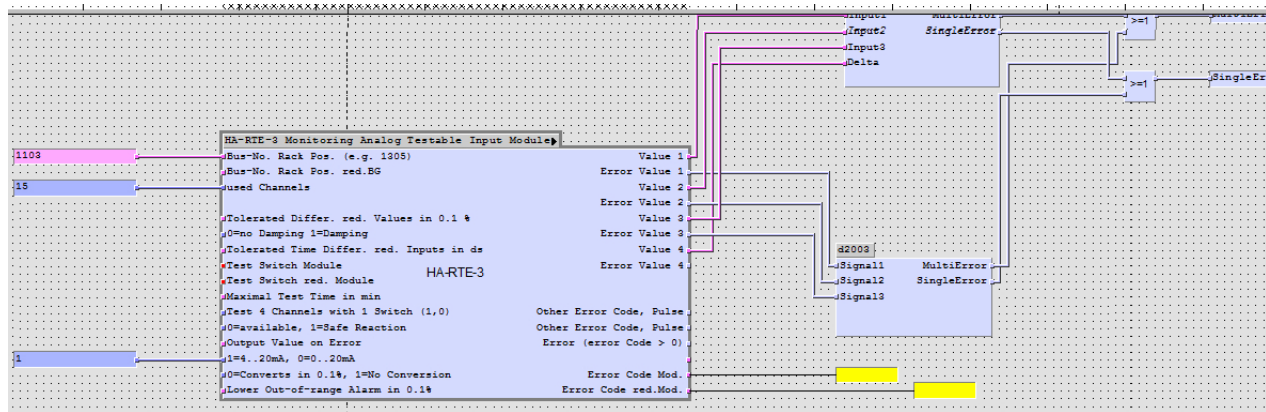


Figure 7: HA-RTE-3

### 3 HIMA OPC Server

Setting up the server

```

myResc01 - Notepad
File Edit Format View Help
// Generated by: HIMA OPC-Server 02/11/2017 17:21:58.447
FileType=BUSCOM
TypeVersion=1.0
Delta,UINT,1000,1000,
Input1,UINT,1001,1001,
Input2,UINT,1002,1002,
Input3,UINT,1003,1003,
MultiError,BOOL,0,,
SingleError,BOOL,1,,

```

Figure 8: Output from OPC-Server

#### 3.1 Determining the IP address of F8625

Determining the IP address of the communication module is determined by the last two digits of the resource. The resource name must have eight characters and the last two characters must be numbers, the last two number characters

decide two IP address. The calculation is shown in page 6 of the F88625 manual.

**For module 1:** Host address = (the last two digits of the resource) \* 2 + 1

**For Module 2:** Host address = (the last two digits of the resource) \* 2 + 2

### 3.2 Controlling the diodes from the OPC-client

Figure 9 shows both diodes on when the difference between 2 or more inputs is larger than the set value (Delta), Multiple Error.



Figure 9: MultiError

### 3.3 Why OPC server?

The HIMA OPC server acts as a transmission interface between systems and manufactures without either of them having to know each other's native protocol.

## 4 Evaluation

The overall learning outcome was good, we got hands on experience in documentation research. The program was very well documented and offered great troubleshooting messages, that made the programming process much easier and lab hours flew away with ease. The software was occasionally faulty and didn't want to run in offline mode, a walk around was "stepping into" the code then resuming, that seemed to fix the offline mode problems, online mode was very smooth.

We've spent 9 hours on this lab, happy with the work load and documentation.