



The power of the GUI in robot programming and –operation

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PPM AS

ROS I Singapore May 26th 2017

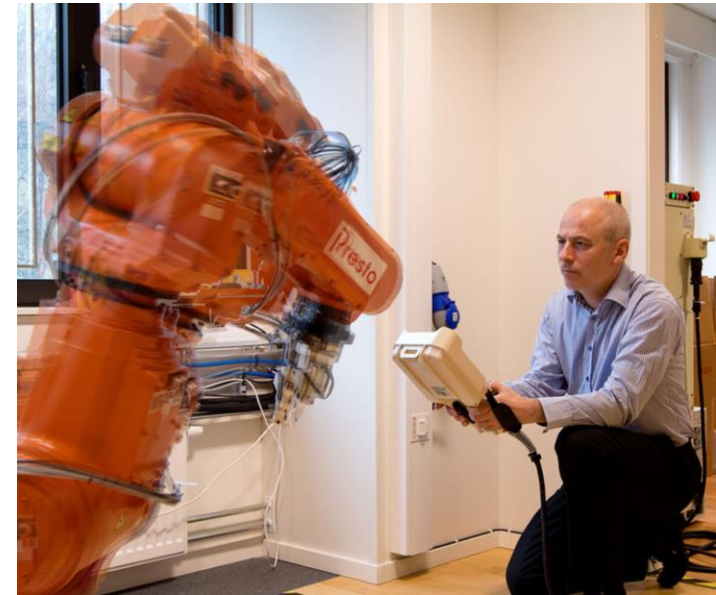




PPM AS



- International high-tech robot-system integrator and software house
- Developing cutting edge industrial robot installations and software for industrial robots
- Collaboration with NACHI Fujikoshi, OTC Daihen, HIWIN, Keba, HYUNDAI
- Full member of ROS Industrial Europe
-and " hang around " in ROS I US and ROS I Asia.....





PPM AS in Trondheim, Norway



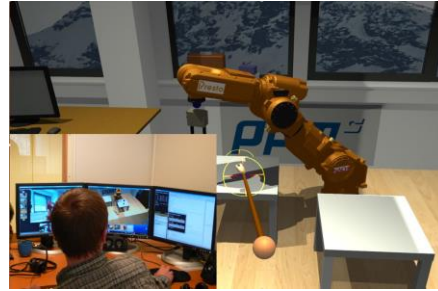
19:40
Consumption
4.0 l/100km
31.5 °C
km trip
117226 1599.2

NORWAY

Norwegian Sea, Nordkapp, Vardø, Kirkenes, Tromsø, Alta, Kautokeino, Lofoten Islands, Narvik, Bodø, Mo i Rana, Arctic Circle, ATLANTIC OCEAN, NORWAY, SWEDEN, FINLAND, Helsinki, Bottniska havet, Trondheim, Hell, Alesund, Andalsnes, Jotunheimen National Park, Lillehammer, Central Norway, Finse, Gello, Oslo, Stockholm, Stavanger, Fredrikstad, Risor, Kristiansand.

HELL GODS - EXPEDITION





Industrial Robotics

- Industrial robot systems
- Industrial robots
- Feasibility studies and experimental verification

Industrial Software

- SPORT
- FlexGui
- Customized software

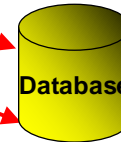
Competence acquisition and - transfer

- Training
- Consultancy
- Research and development



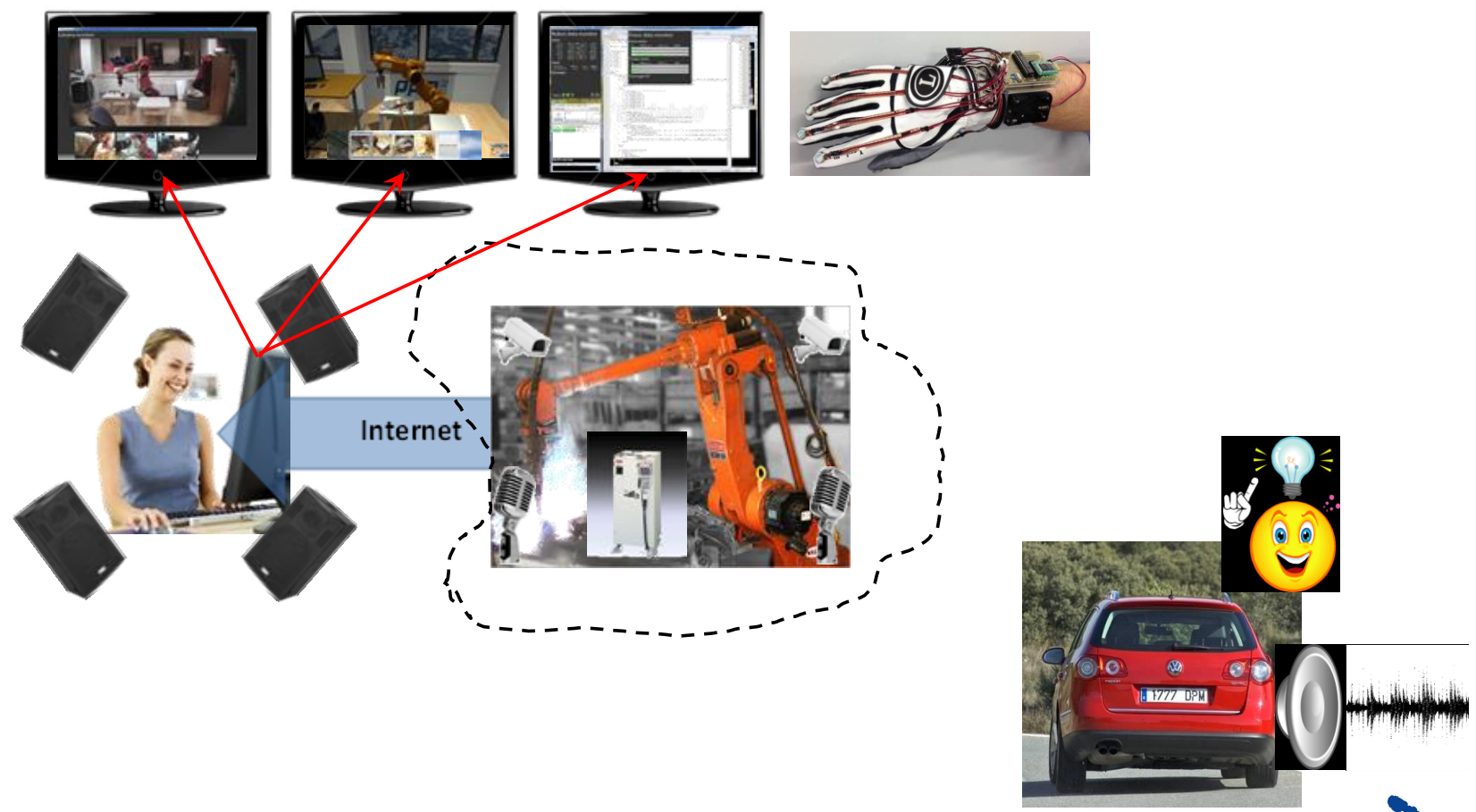


High tech robot systems





Main R&D – remote support of end customers using 4MC

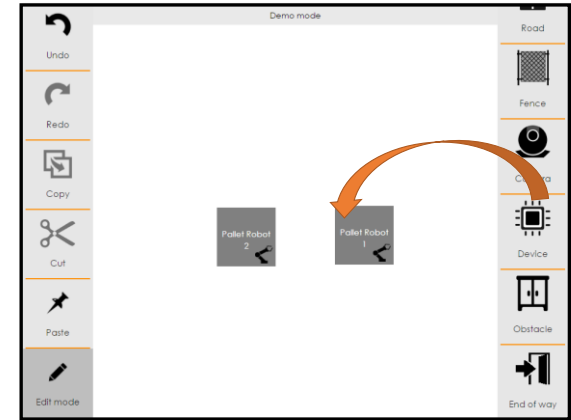




FlexGui 4.0



- GUI to ROS I
- Providing nice looking, easy-to-use GUIs by simple drag'n drop
- Platform independent
- Full remote operation



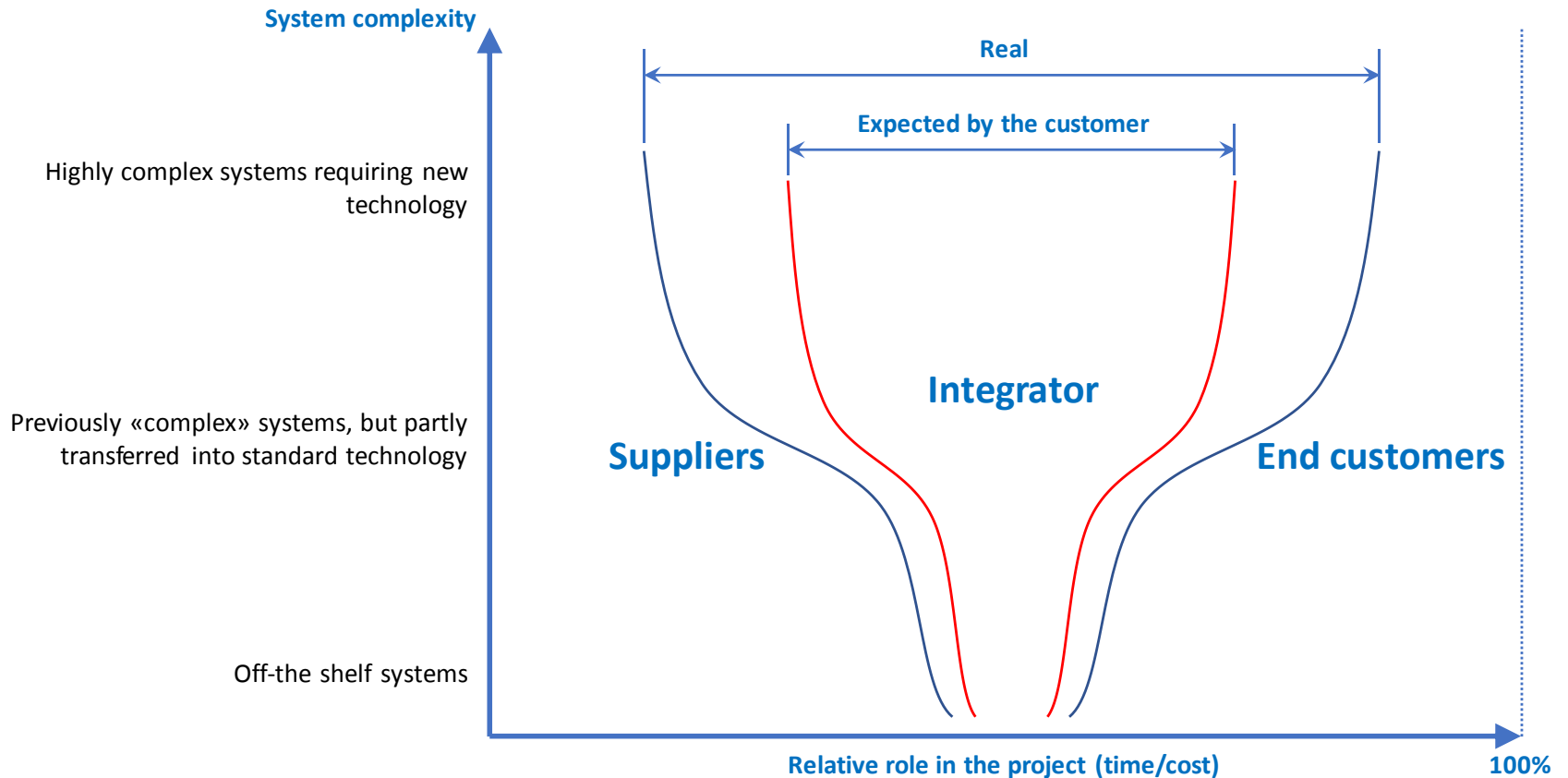


- The truth :
 - The industry requests new technology to maintain competitiveness
 - New technology is risky and time / cost consuming to implement
 - The end customers tend to underestimate the complexity system



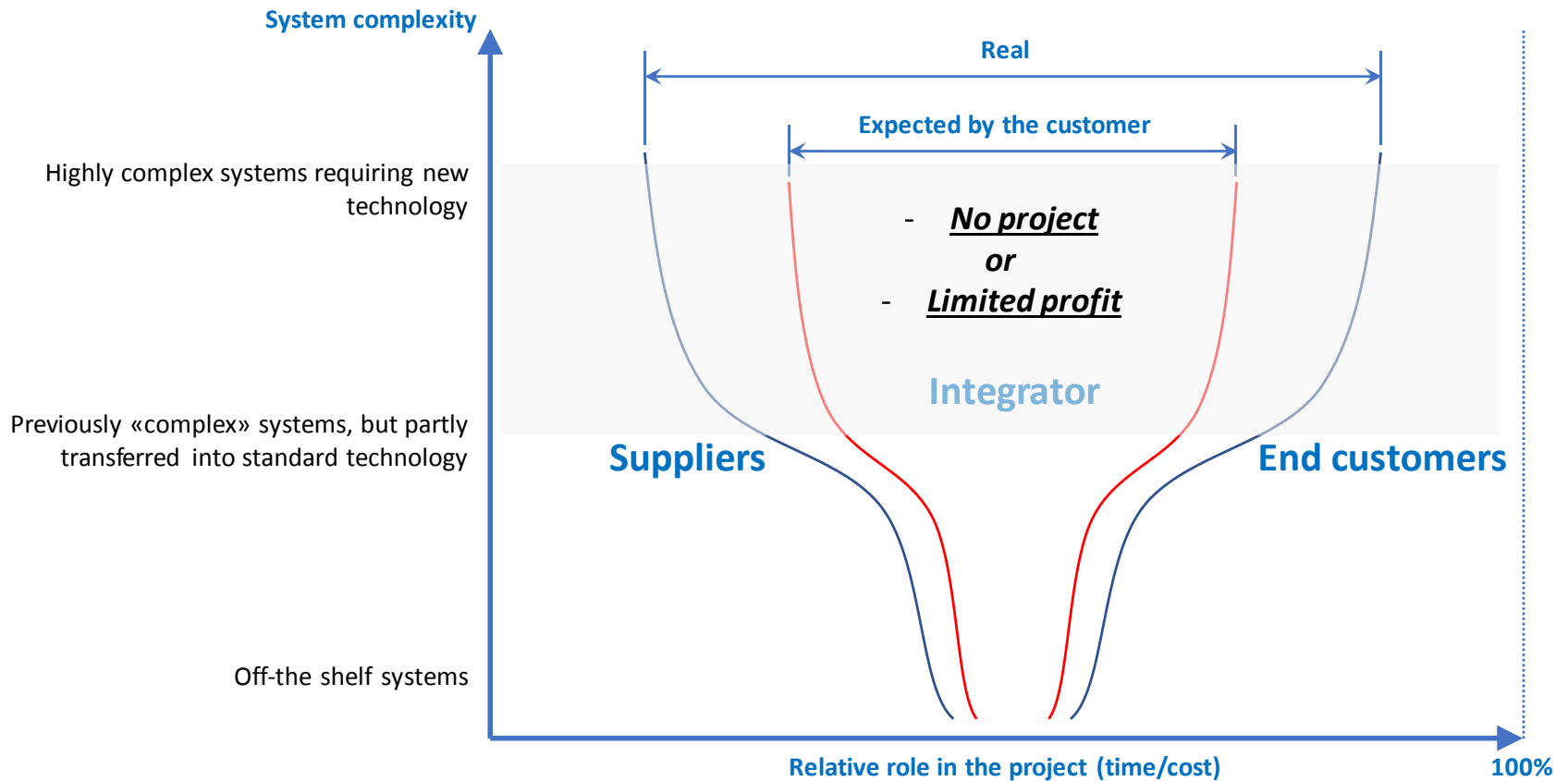


The challenge to enable high tech projects



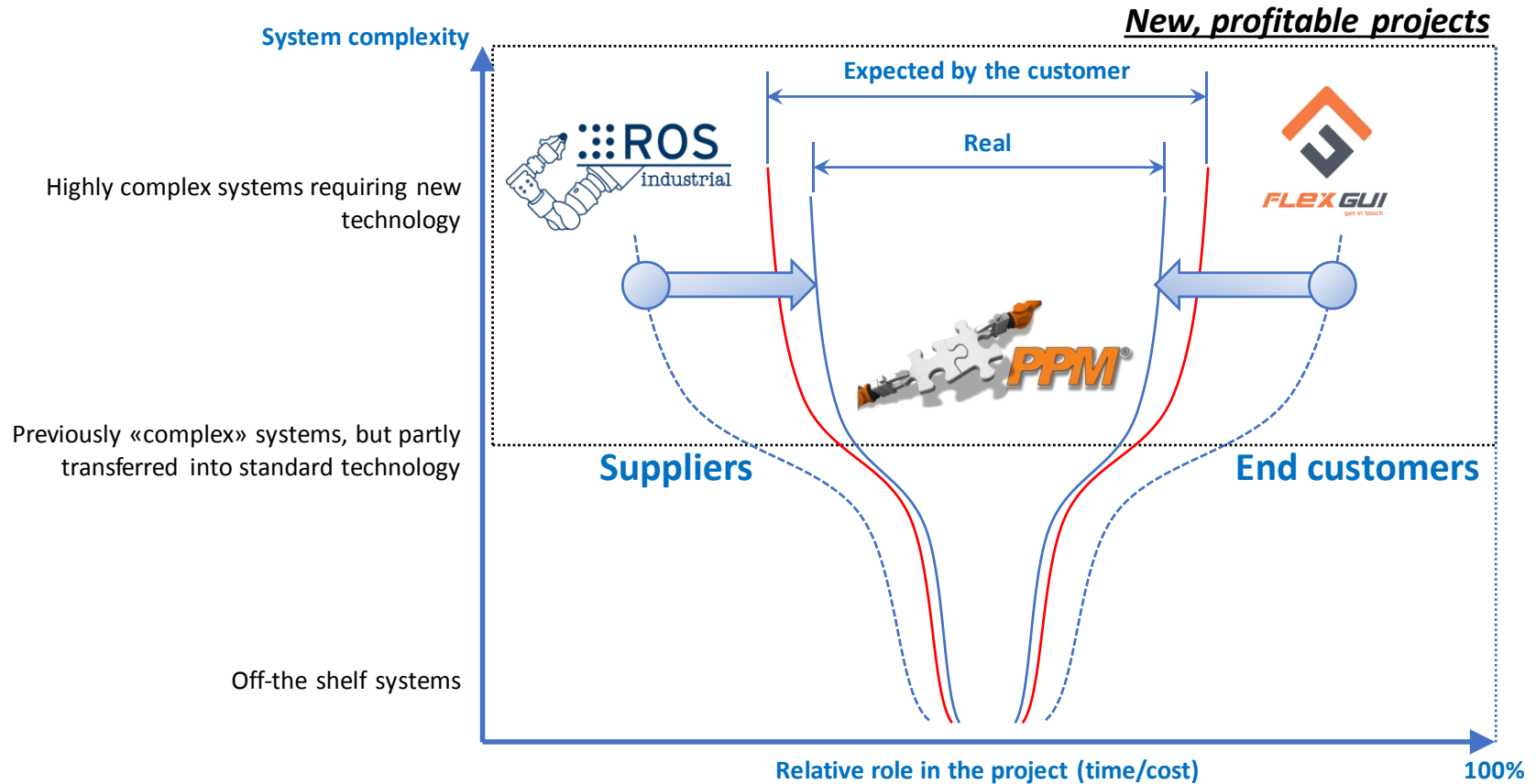


The challenge to enable high tech projects





What's the ROS I magic ?





HIWIN – easy-to-use pick'n place



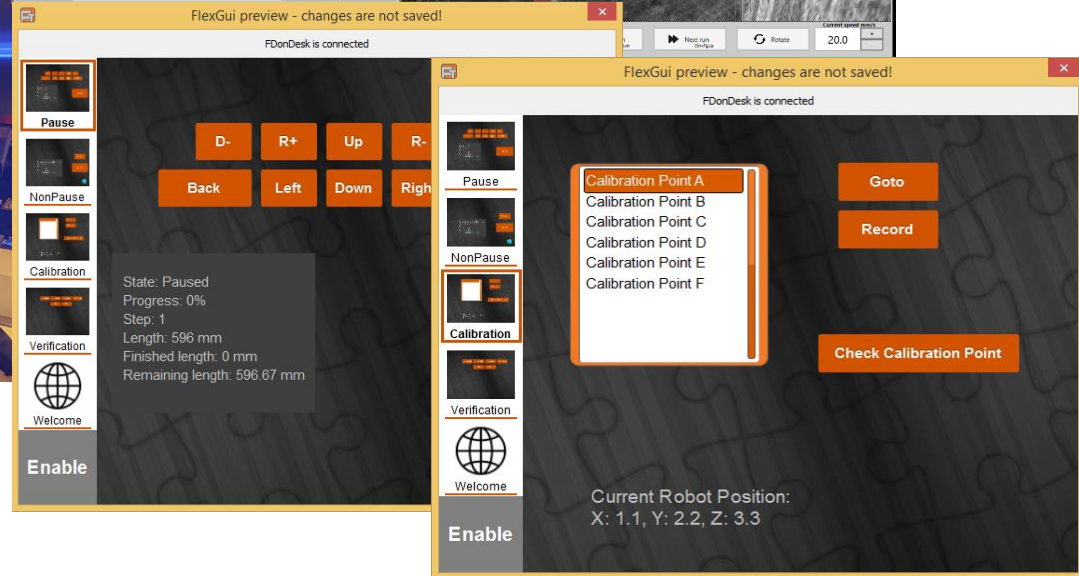


NACHI – force controlled picking



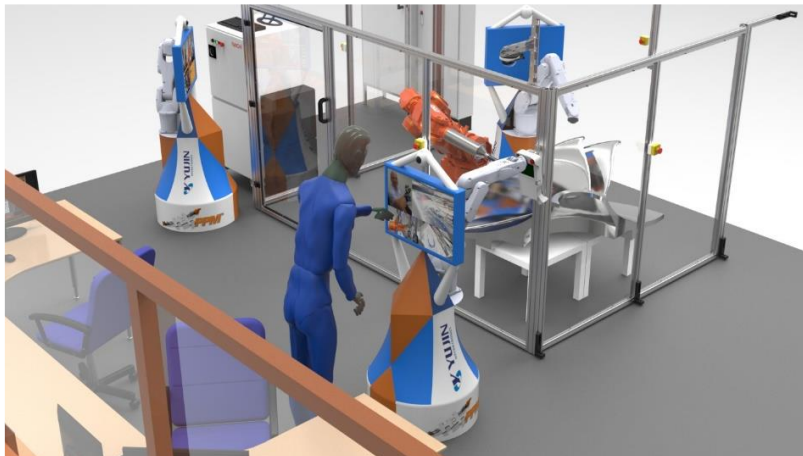
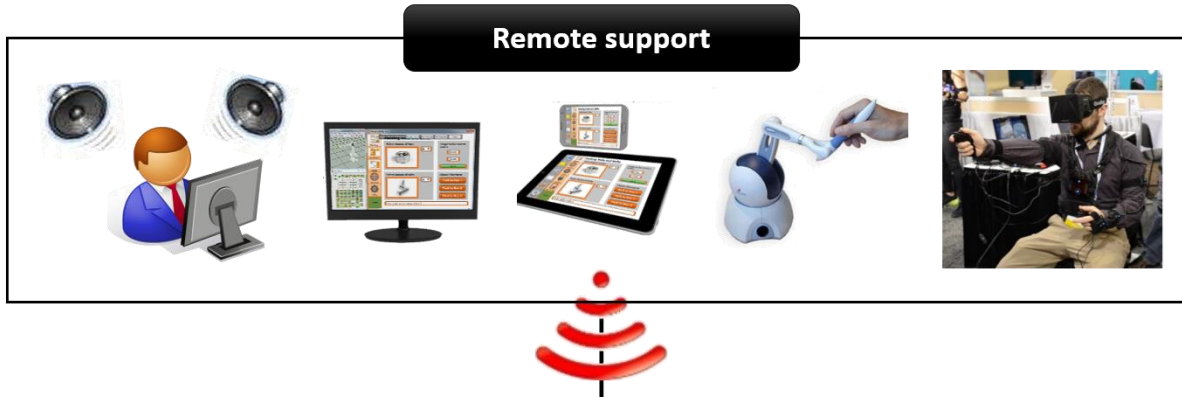


Rainpower Norway AS– Heavy multi-pass TIG Welding





iVAR – intelligent Versatile Avatar Robot

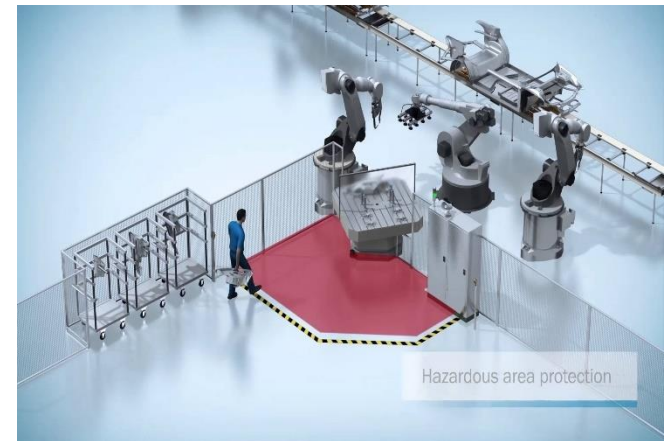




When, currently, to use ROS I ?

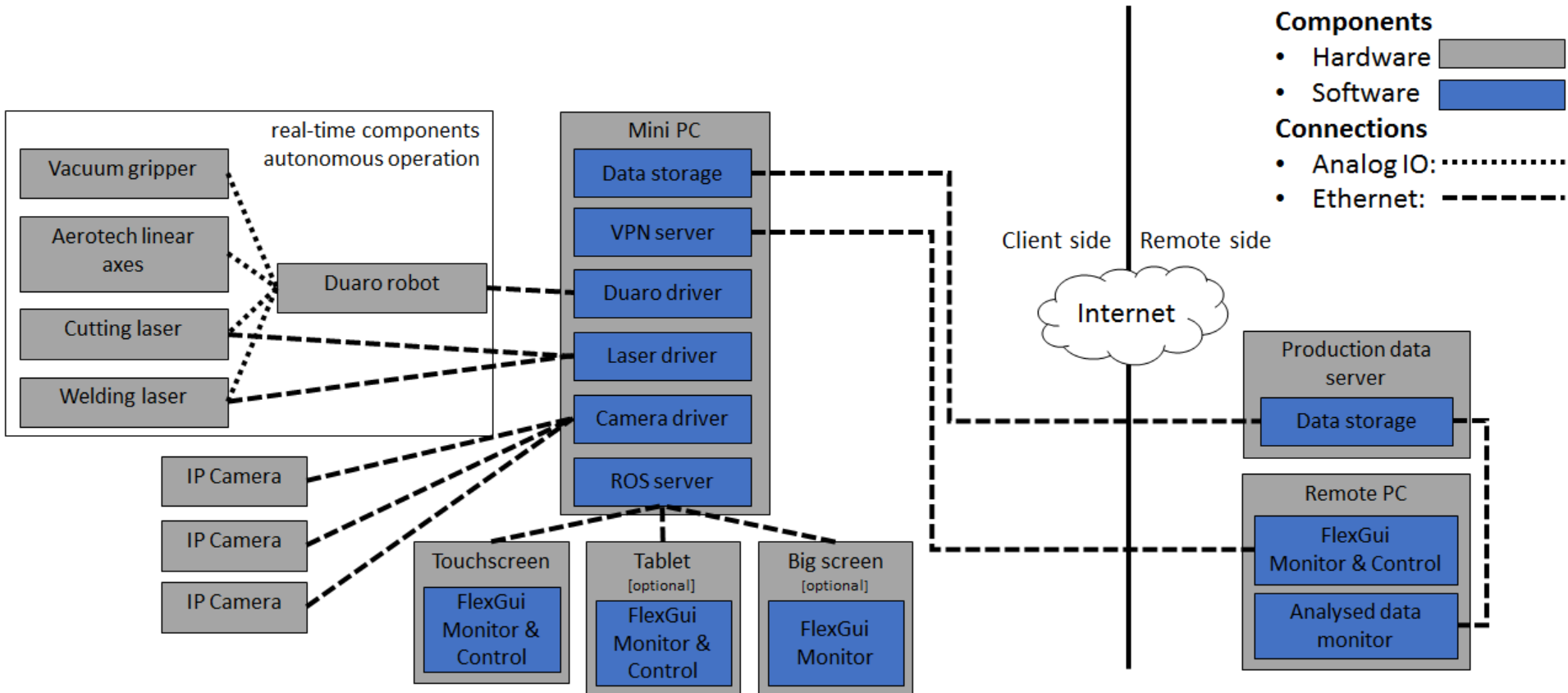


- Industrial hardware and software
 - Safety related functions
 - RT and path execution functions requiring high reliability
- ROS I
 - Non RT sensor control
 - Process modelling, planning and -monitoring
 - Path programming and -optimization
 - User operation and GUI





ROS as middleware

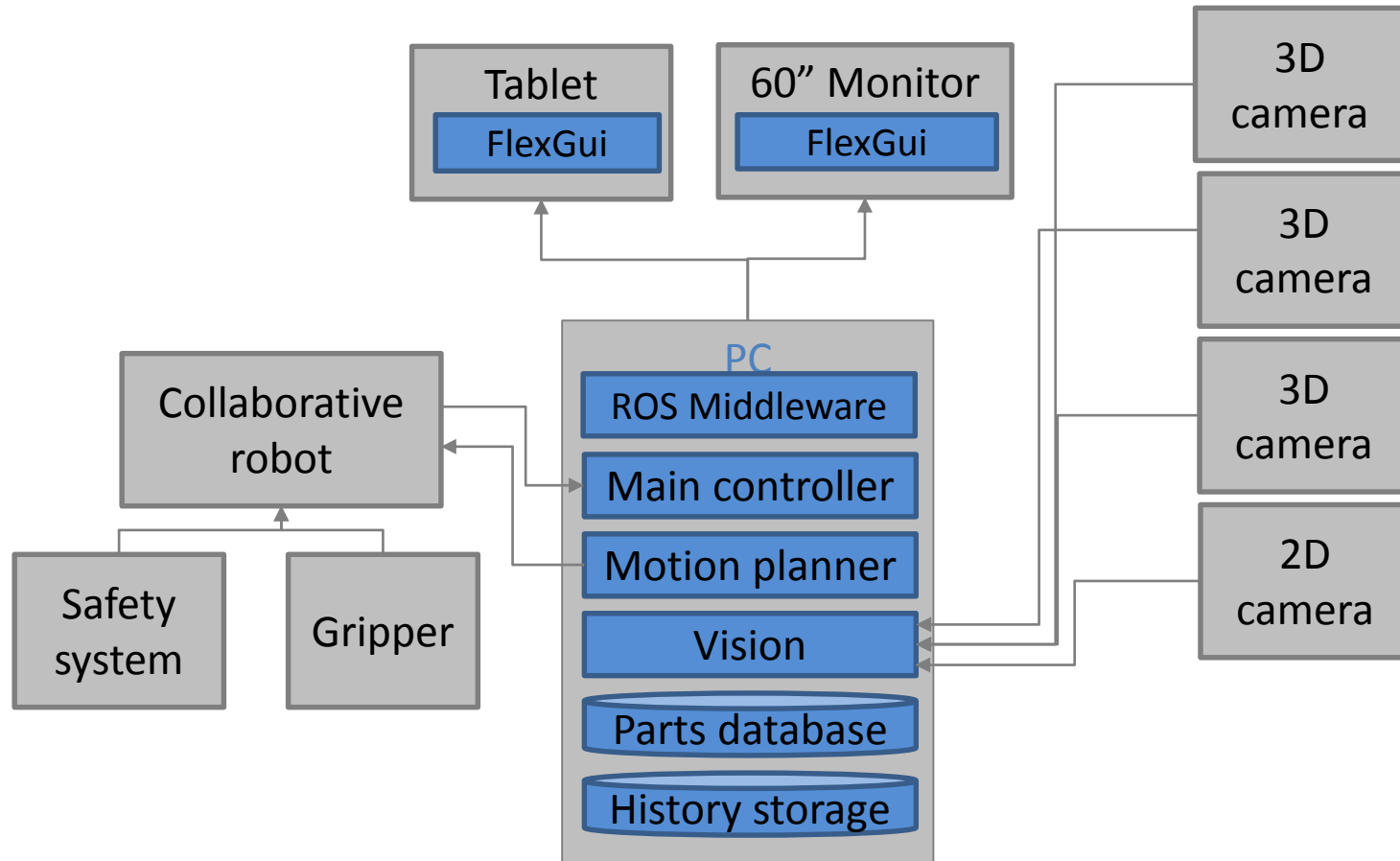


Component diagram of a welding application





ROS-based motion planning



Component diagram of a heavy-metal application

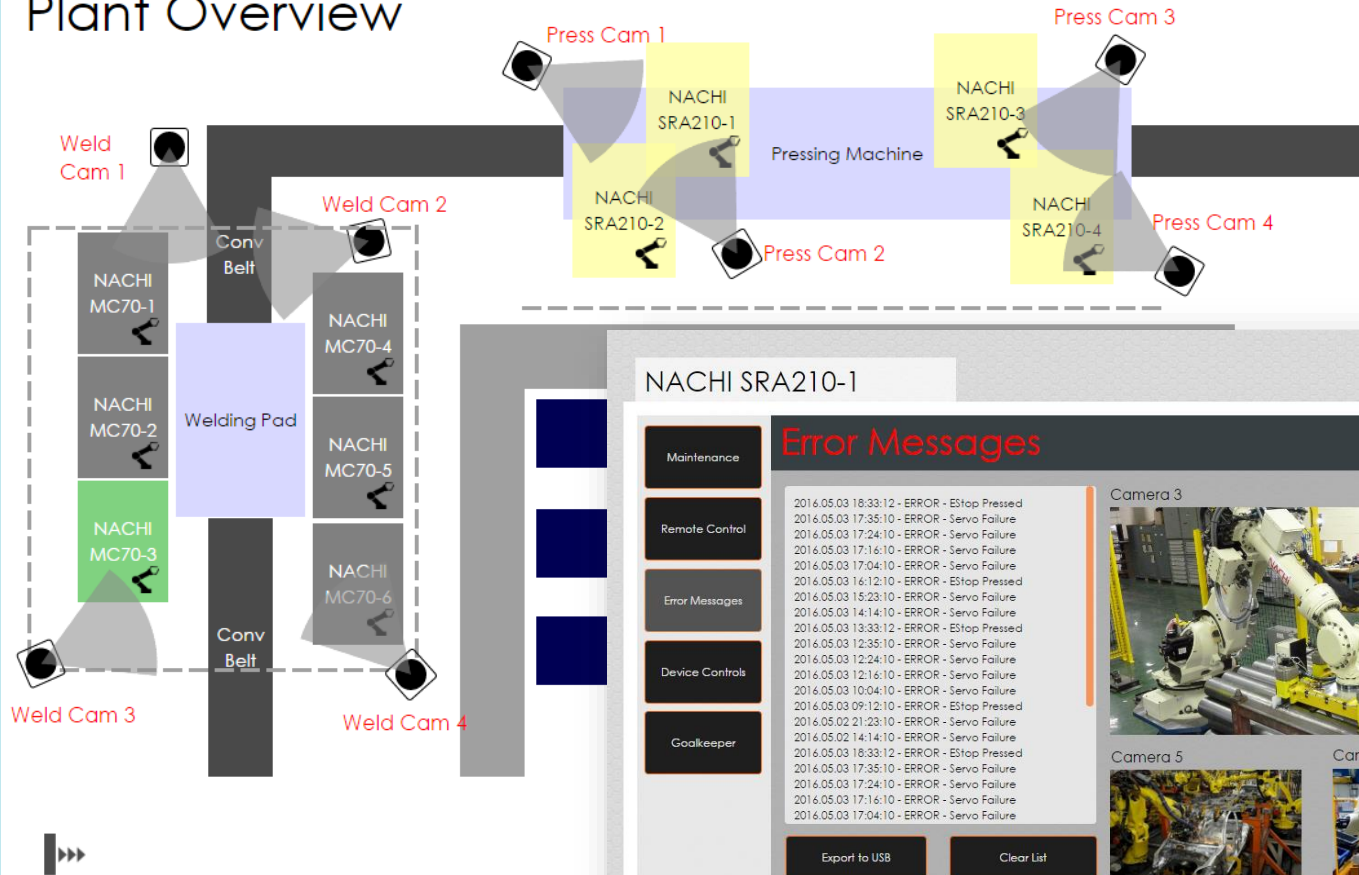




Agile development



Plant Overview



NACHI SRA210-1

The screenshot shows the control interface for a NACHI SRA210-1 robot. On the left, there is a vertical menu with buttons for 'Maintenance', 'Remote Control', 'Error Messages', 'Device Controls', and 'Goalkeeper'. The 'Error Messages' button is selected, displaying a list of error logs. On the right, there are three camera viewports labeled 'Camera 3', 'Camera 5', and 'Camera 4', each showing a different perspective of the robot arm in a factory setting. At the bottom of the error list, there are buttons for 'Export to USB' and 'Clear List'.

Timestamp	Error Message
2016.05.03 18:33:12	ERROR - EStop Pressed
2016.05.03 17:35:10	ERROR - Servo Failure
2016.05.03 17:24:10	ERROR - Servo Failure
2016.05.03 17:16:10	ERROR - Servo Failure
2016.05.03 17:04:10	ERROR - Servo Failure
2016.05.03 16:12:10	ERROR - EStop Pressed
2016.05.03 15:23:10	ERROR - Servo Failure
2016.05.03 14:14:10	ERROR - Servo Failure
2016.05.03 13:33:12	ERROR - EStop Pressed
2016.05.03 12:35:10	ERROR - Servo Failure
2016.05.03 12:24:10	ERROR - Servo Failure
2016.05.03 12:16:10	ERROR - Servo Failure
2016.05.03 10:04:10	ERROR - Servo Failure
2016.05.03 09:12:10	ERROR - EStop Pressed
2016.05.02 21:23:10	ERROR - Servo Failure
2016.05.02 14:14:10	ERROR - Servo Failure
2016.05.03 18:33:12	ERROR - EStop Pressed
2016.05.03 17:35:10	ERROR - Servo Failure
2016.05.03 17:24:10	ERROR - Servo Failure
2016.05.03 17:16:10	ERROR - Servo Failure
2016.05.03 17:04:10	ERROR - Servo Failure

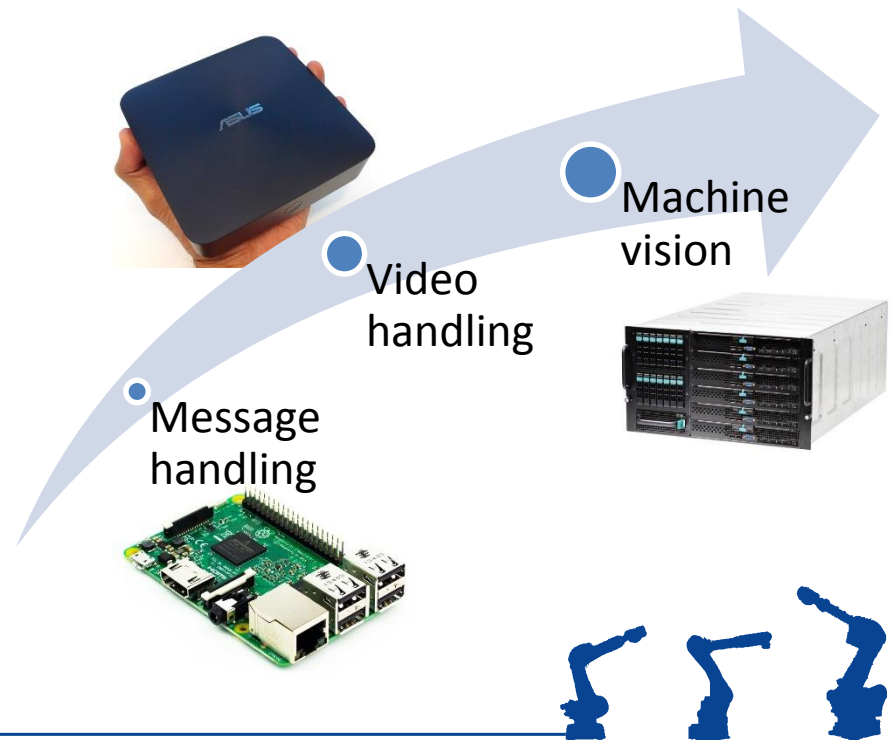




Plug and Play ROS



- robot_upstart package
 - Qt5
 - ROS (a test launch file starts automatically after boot)
 - Camera driver
 - Rosbridge
 - OpenVPN server
 - Hamachi server
 - USB auto mount

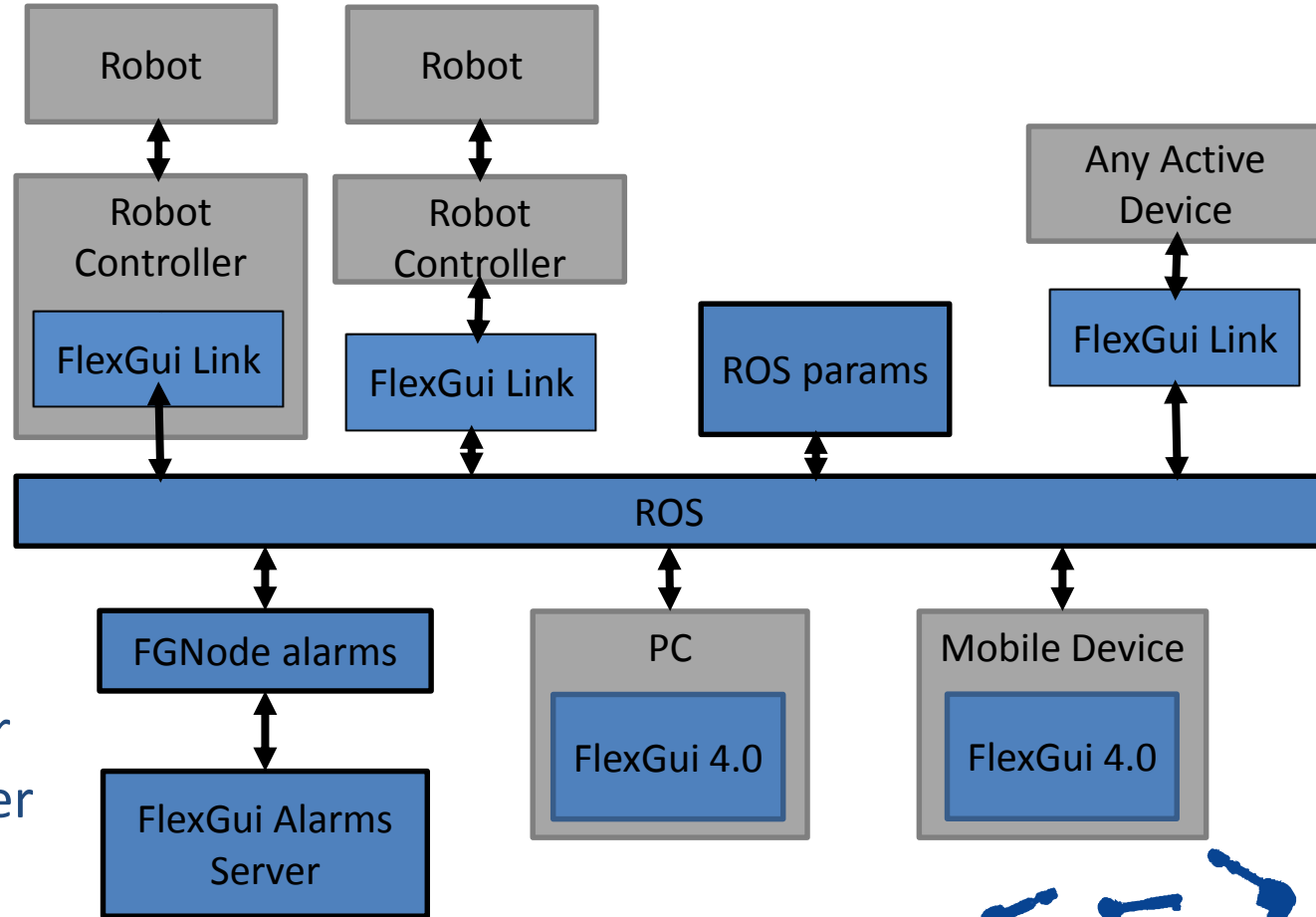




Our latest drivers



- Robots
 - NACHI
 - Hyundai
 - HIWIN
 - ABB
 - KEBA
 - Kawasaki
- Driver levels
 - High level
 - ROS-I
- Other drivers
 - Cutting laser
 - Welding laser





The FlexGui Link interface



Services

- `Variables(void) : string[]`
 - Returns the list of available variables. Note, that some variables are renamed to be compatible with the ROS naming convention (e.g. `V1%` is `Integer1`).
- `Subscribe(string variableName) : string`
 - Subscribes to the variable. It also triggers a refresh on the topic. Returns the error string when there is an error.
- `Unsubscribe(string variableName) : string`
 - Unsubscribes the variable. Returns the error string when there is an error.
- `ChangeVariable(string name, string value) : string`
 - Changes the value of the variable called `name`. Returns the error string when there is an error.

Topics

- `[/FlexGui name]/Variables/[variable name] : Variable`
 - FlexGui will create a new topic for every subscribed variable using a path starting by the name of the FlexGui instance and ending by the variable name.
 - When the subscribe function is called again or the value of the variable changes, the new value will be published on this topic using the `/nachi_tools/Variable` type.





What's new in FlexGui



- Improved functions
 - Better image/video handling
 - Better variable handling
 - New wizards
- New design – also in the open-source version on GitHub
 - Fully customizable color sets
 - Use your own company's logo and colors
- UX team
 - Graphical, UX designers
 - Drivers and components ready-made
 - Application development included in Professional license
- Licensing
 - The core software is open source
 - The modules can be licensed one-by-one
 - Full version 30-day trial

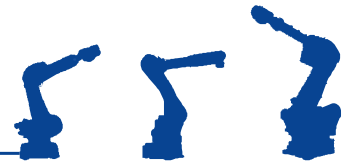




How to get FlexGui 4.0 ?



- Homepage: www.ppm.no/flexgui4-Home
 - Product description, documentation, on-line trial
- ROS: github.com/ros-industrial/flexgui_industrial
 - Open source download





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