

XEL Network

Modular H/W ecosystem using ROS2

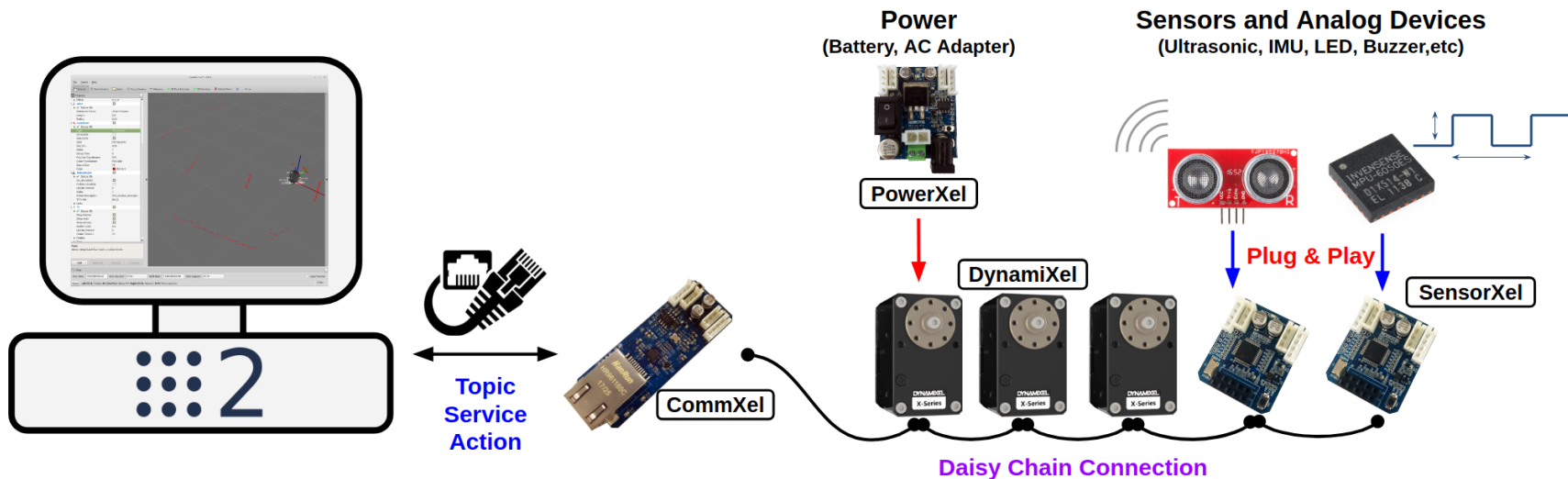
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ROBOTIS



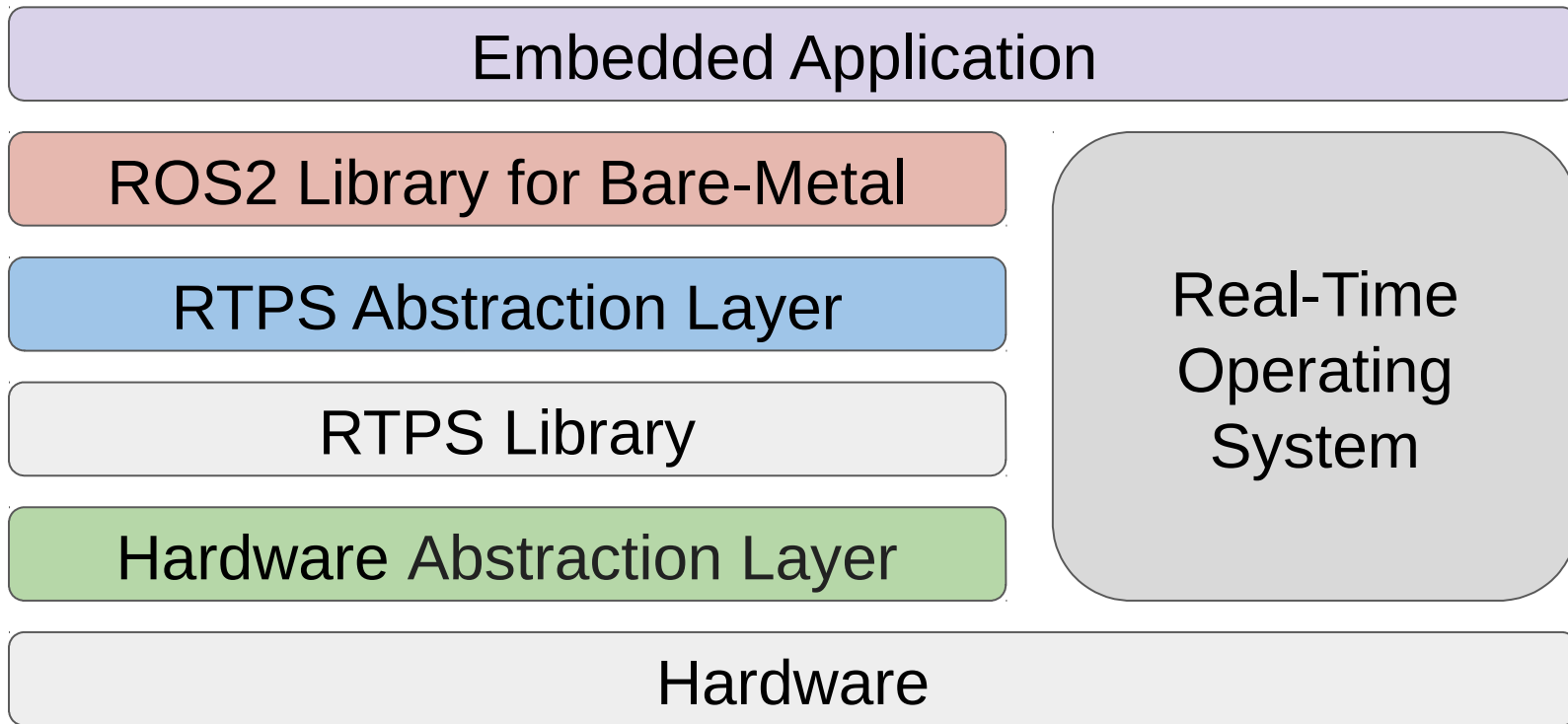
Purpose

- Practical system with MCU using ROS2



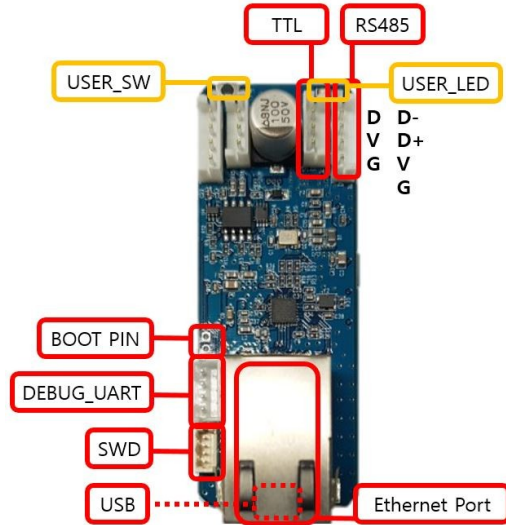


F/W Architectures



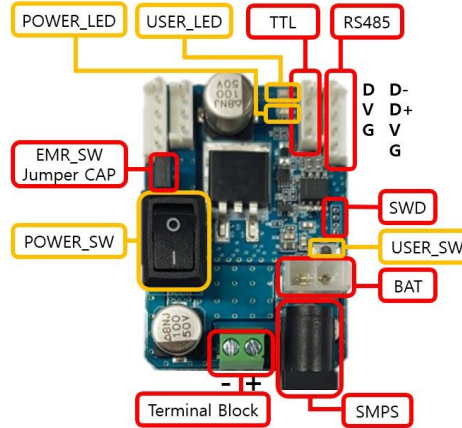


Prototype Boards



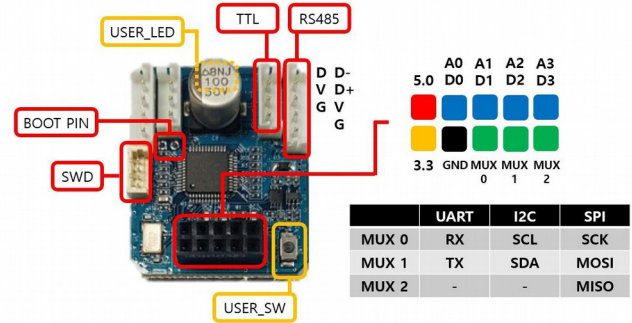
CommXEL

Collect XEL information
Communicate with ROS2



PowerXEL

Power Management
Power Distribution



SensorXEL

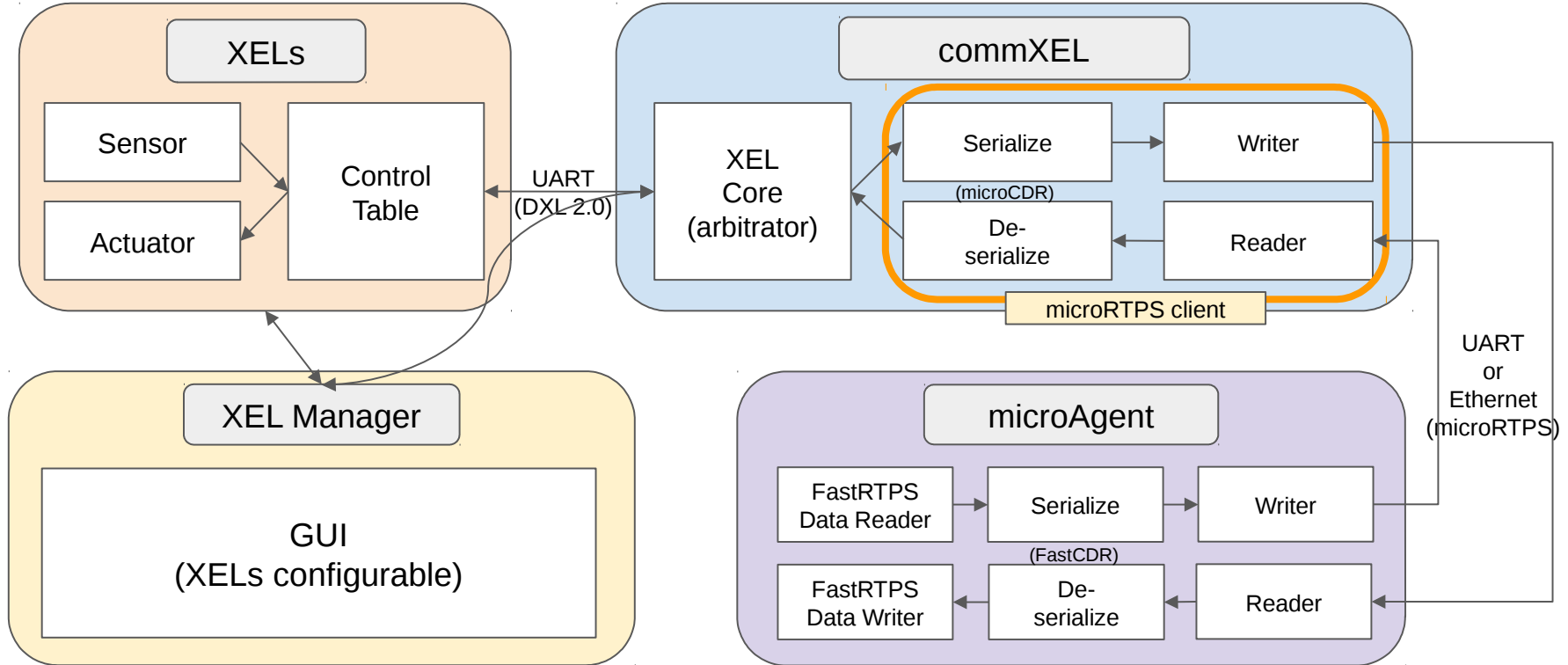
Get Sensor Data
Control GPIO

	A0	A1	A2	A3
5.0	D0	D1	D2	D3
3.3	GND	MUX 0	MUX 1	MUX 2

	UART	I2C	SPI
MUX 0	RX	SCL	SCK
MUX 1	TX	SDA	MOSI
MUX 2	-	-	MISO



Diagrams





Features

The screenshot shows the XEL Manager software interface. On the left, there is a table with columns: Area, Addr, Name, Size, Type, Acc, Data, and Debug. The table lists various memory locations and their associated data types and access permissions. On the right, there is a configuration panel with fields for Port, ID, Baud, and Model, along with a 'LoadModel' button. Below these fields is a 'Common' section with a 'Ping' button and a table with columns 'ID' and 'Model'. At the bottom, there is a 'Command' field.

Area	Addr	Name	Size	Type	Acc	Data	Debug
1	CON	0	Model_Number	2	uint16_t	R	<input type="checkbox"/>
2	CON	2	Model_Info	4	uint32_t	R	<input type="checkbox"/>
3	CON	6	Firmware_Version	1	uint8_t	R	<input type="checkbox"/>
4	EEP	7	ID	1	uint8_t	...	<input type="checkbox"/>
5	EEP	8	Baud	1	uint8_t	...	9600 <input type="checkbox"/>
6	EEP	32	XEL_DATA_TYPE	1	uint8_t	R	BOOLEAN <input type="checkbox"/>
7	EEP	33	XEL_DATA_HZ	4	uint32_t	R	<input type="checkbox"/>
8	EEP	37	XEL_DATA_NAME	32	str_t	R	<input type="checkbox"/>
9	EEP	69	XEL_DATA_DIRECT...	1	uint8_t	R	SEND <input type="checkbox"/>
10	RAM	70	XEL_DATA_ADDR	2	uint16_t	R	<input type="checkbox"/>
11	RAM	72	XEL_DATA_LENGTH	1	uint8_t	R	<input type="checkbox"/>
12	RAM	128	XEL_DATA	4	uint32_t	R	<input type="checkbox"/>

- Set topic name and type using XEL Manager
- Plug-And-Play
- Daisy-chain





Thanks & Plan

- Arduino library (project name: **ros2arduino**)
- Enhance abstraction layer
- Add **Modbus** for PnP
- Add **WiFi** hardware

- XEL Network wiki : <http://xelnetwork.robotis.com>
- OpenSource (H/W, F/W, S/W) / Apache2.0
- Welcome contributors