


厦门大学机器人队

先期培训 · 控制器



厦门大学机器人队

- 
- 定义和功能
 - 队内使用的控制器

The background features a blue technical drawing on a grid. It includes two circular diagrams at the top, a rectangular frame in the middle, and a detailed mechanical assembly at the bottom. A small text box in the middle reads: "The M7000 Accessories Kit includes several items and a terminal block, creating a complete production system driven by four independent robots." The text "ROBOTECH & SYSTEM" is visible on the bottom right of the mechanical drawing.

先期培训 · 控制器

定义和功能

定义和功能

- 控制器是根据代码结合传感器反馈控制执行器运行的硬件设备
- 1.控制执行器运行
- 2.接收传感器反馈
- 3.信息处理

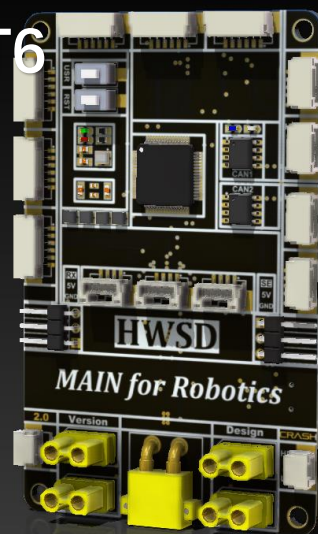
The background features a blue technical drawing on a grid. At the top, there are two circular diagrams of a robotic gripper, showing internal mechanisms and mounting points. Below these, on the left, is a rectangular control panel with a central screen and four buttons. To its right is a small text box with a leader line pointing to it. At the bottom, there is a detailed side-view diagram of a robotic arm with a gripper, featuring a 'Pneumatics' logo and the text 'Pneumatics & Hydraulics' on its side.

先期培训 · 控制器

队内使用的控制器

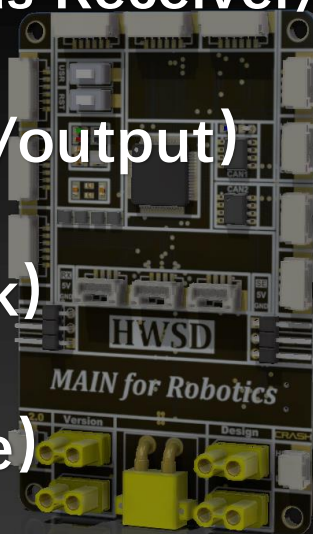
队内使用的控制器

- 主控板：基于STM32F405RGT6
- 供电：24V，XT30接口
- 通信：GH1.25接口
- 主要用于执行器控制



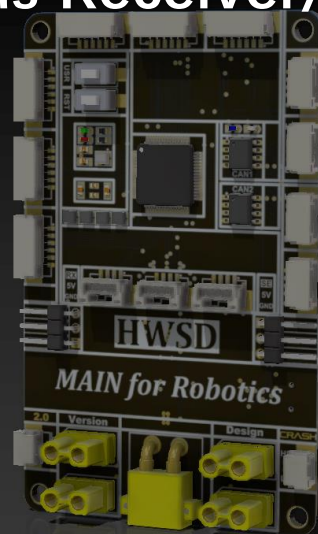
常用控制协议

- UART (Universal Asynchronous Receiver/Transmitter)
- GPIO (General-purpose input/output)
- CAN (Controller Area Network)
- SPI (Serial Peripheral Interface)
- IIC (Inter-Integrated Circuit)
- SWD (Serial Wire Debug)



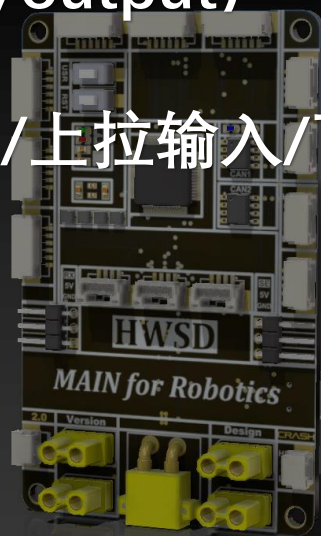
通用异步收发传输器

- UART (Universal Asynchronous Receiver/Transmitter)
- 串口通信
- 通用串行数据总线
- 全双工传输
- 最常见的通信方式



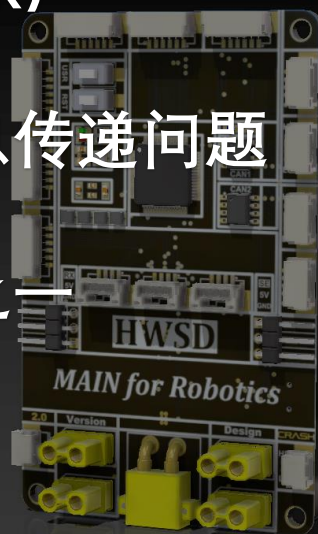
通用输入输出

- GPIO (General-purpose input/output)
- 高阻态/低电平输出/高电平输出/上拉输入/下拉输入
- 最基础的通信方式



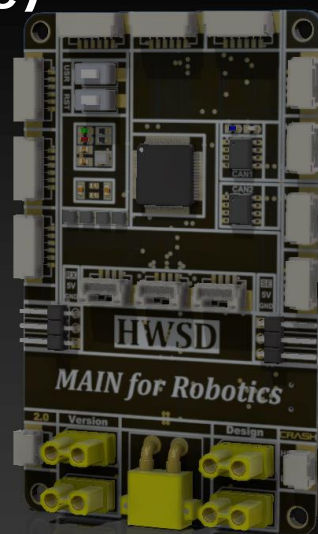
控制器局域网络

- CAN (Controller Area Network)
- 现场总线：解决工业现场的信息传递问题
- 国际上应用最广泛的现场总线之一
- 最重要的控制方式



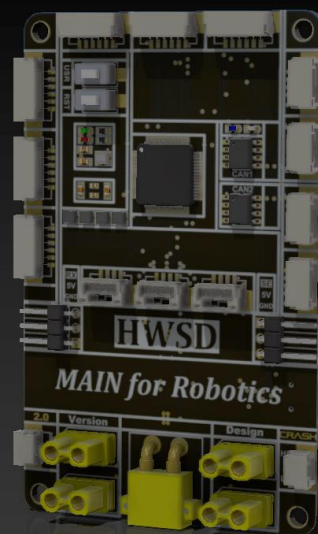
串行外设接口

- SPI (Serial Peripheral Interface)
- 高速全双工同步通信总线
- 4线制



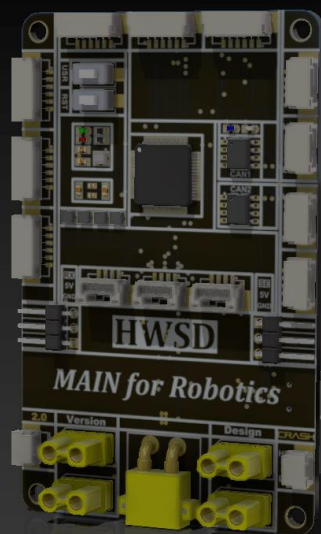
I2C总线

- IIC (Inter-Integrated Circuit)
- 双向二线制同步串行总线
- SDA: 串行数据线
- SCL: 串行时钟线
- 开漏输出, 需要接上拉电阻



SWD调试

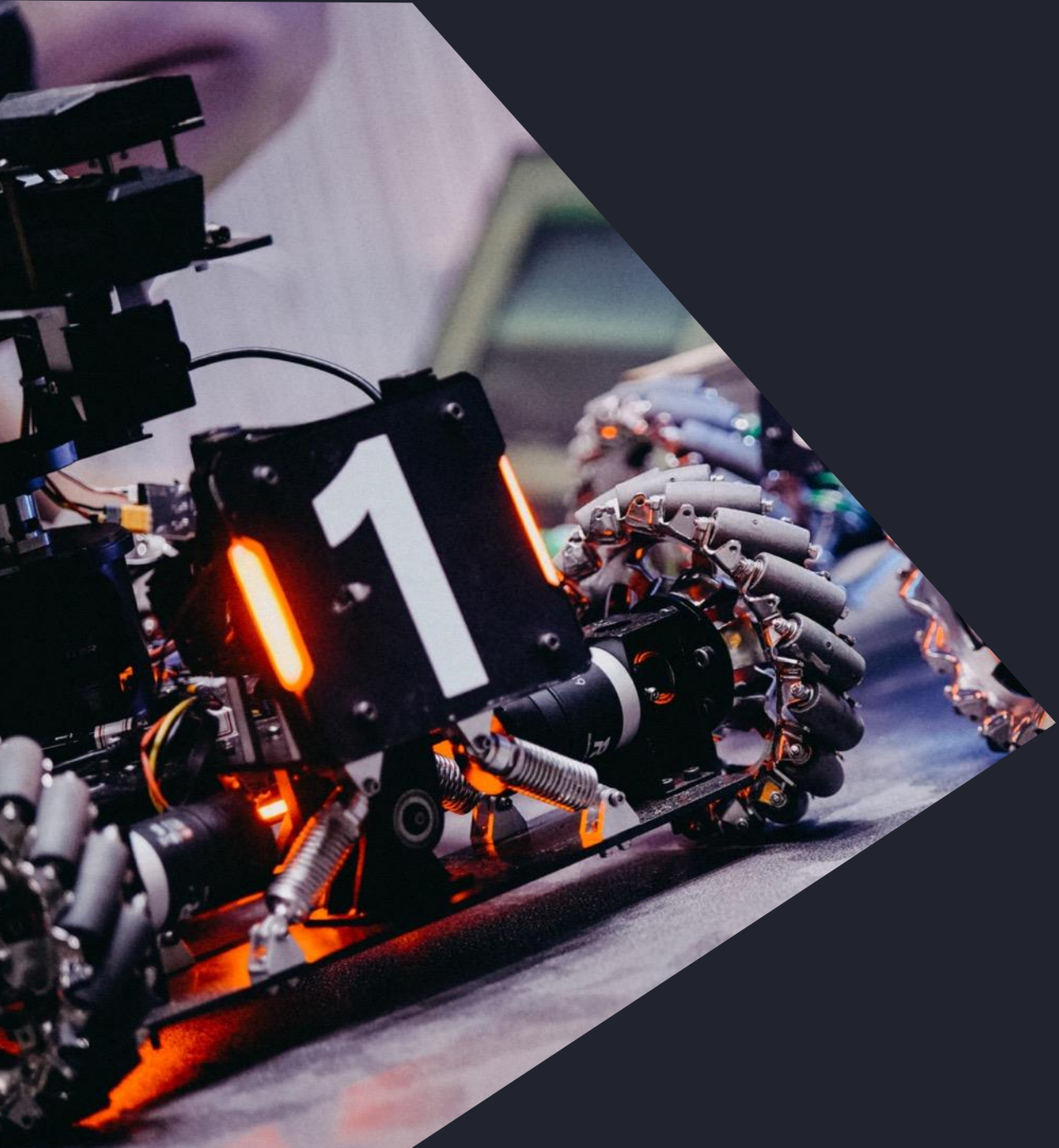
- SWD (Serial Wire Debug)
- SWDIO: 调试数据线
- SWDCLK: 调试时钟线
- STM32系列调试接口



队内使用的控制器

- 算法设备：NUC (MiniPC)
- 供电：19V
- 通信：使用USB to TTL串口模块
- 主要用于视觉识别（OpenCV、YOLOv3）





感谢观看

自强不息 止于至善