Protocol Design

WarePro

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Introduction

Without an effective protocol, communication might not work as expected and as result the robot might have unexpected behavior. This protocol is designed for communication between our C# control application and the master microcontroller. The commands are designed with the intention to create a robust and responsive protocol that handles different situations and errors.

Protocol Architecture

START	COMMAND	DATA	CHECKSUM	END
$	MOVE	AA	441	#

Explanation:

Between the command and data, and data and checksum we use a separator " | " so an example string will be: "$MOVE|A1|425#".

To indicate the start of a message, we use the "$", followed by that we have a command that indicates what the robot should do (all commands with explanations can be found in the Possible commands table). After the command we have a separator as mentioned before and after we have the data that goes with the command. After the data we have a separator again and then the checksum, we use a checksum as error handling.

In our case the checksum calculates the ASCII value of the command and data combined and sends it in the protocol message for the other device to compare and check the integrity of the received data.

We use the "#" symbol to indicate the end of the message.

Possible Commands

Action	Explanation	Command
Move to location	Instructs the robot to move to location	MOVE
Emergency Stop	Stops the robot immediately	STOP
Speed data	Sends current speed information	SPEED
Location data	Sends current location information	LOC