Profile
Standard Robot Command Interface
SRCI

Technical Specification
for PROFINET

Version 1.4 – January 2024

Order No.: 3.252

File name: Profile-Robot-Command-Interface_3252_V1.4_Jan24.docx

Prepared by PI Project Group 16 “Robot Systems” in the Committee 3 “Application Profiles”.

In this specification the following key words (in **bold** text) will be used:

may: indicates flexibility of choice with no implied preference.

should: indicates flexibility of choice with a strongly preferred implementation.

shall: indicates a mandatory requirement. Designers **shall** implement such mandatory requirements to ensure interoperability and to claim conformance with this specification.

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Content

1 Management Summary - Scope of this Document

This document describes the specification of all required features required for developing a unified standard robot interface (RI) between robot controller (RC) and a Programable Logic Controller (PLC).
The RI will allow the PLC to send motion and other commands to the RC and check the status of the robot.
This specification defines the communication mechanism between the RC and PLC and standardizes definitions and robot commands among different manufacturers.
The target of the RI will be the basis to create a mechanism for controlling a robot directly from the PLC without requiring additional programming at the RC side, e.g. using the original robot's HMI pendant.

1.1 Requirements

The RI will allow the following features:

- Send motion commands from PLC to the RC.
- Operate the robotic arm via an HMI connected to the PLC in the same way as the robot manufacturer's original HMI.
- Gather basic diagnostic information from the RC and the robotic arm.

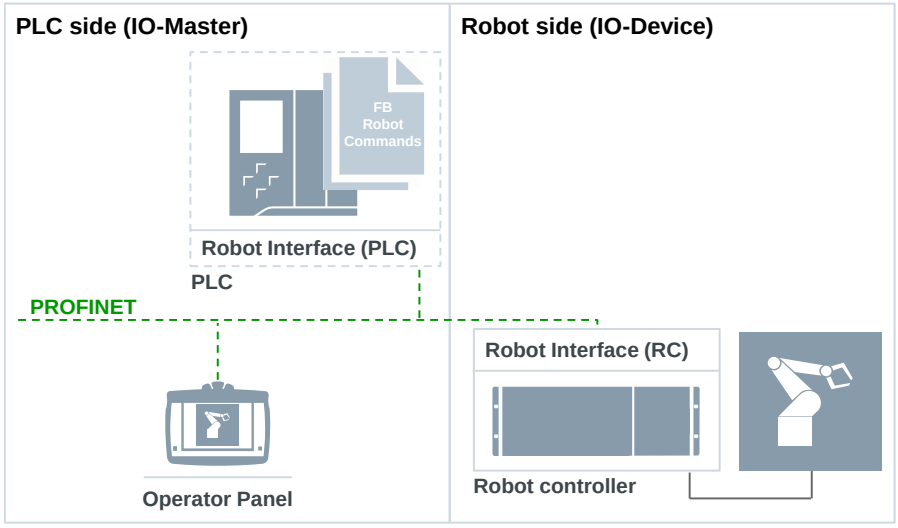
1.2 How to read

This document contains information about the command management and network layer for developing the interface. It also contains information about the design of the "Application Layer", that will be visible to the user.
For each function described in chapter 6, a dedicated section for each aspect is given.

5 Introduction

5.1 Interface concept

The RI communication between the PLC and the RC is realized via PROFINET (isochronous mode is not necessary).
This connection is used to exchange all commands and status information between the PLC and the RC.
The motion commands are sent from the PLC to the RC; thus, movements are triggered only by PLC when the



NOTE The examples in this document are always based on PROFINET. However, the realization will also be possible on all other common Fieldbuses.

5.2 Functionality

5.2.1 PLC side

In this document, only the description of the interface is specified.
The PLC will send the commands to the robot using "Function Blocks" that will be specified in a separate document apart.
Calling a function block from the PLC library sends the corresponding commands to the RC.

5.2.2 RC side

An application running on the RC handles the PLC’s commands and sends back the information to the PLC.
The RC shall store these commands in a buffer and executes the instructions in its own cycle.

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