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USER MANUAL

Updated: July 16th, 2021

Application Programming Interface: Low-Level Sockets

Version 1.0



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Overview

This document details the commands that can be sent to a MachineMotion using Ethernet TCP/IP protocol. This API uses sockets to exchange data. All information is packaged in string format and sent over the socket communication channel to port 9999 of the ethernet IP Address.

Selecting/Configuring your IP Address

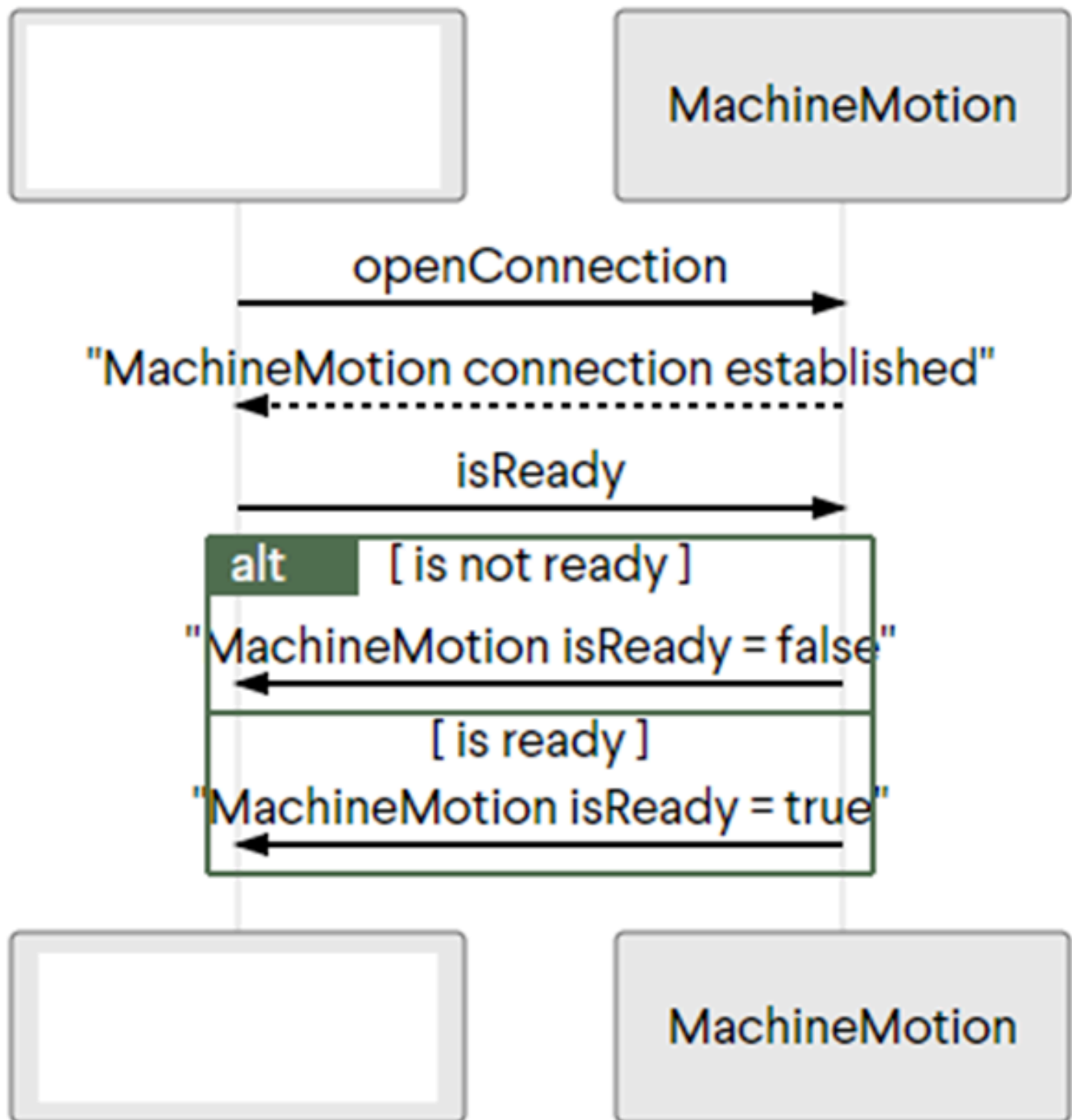
There are two physical ethernet connections available on the MachineMotion. The default ethernet will always have an IP address of 192.168.7.2. The second ethernet port has a configurable IP address. The configurable IP address can be set in one of three ways:

- Using a laptop and chrome web browser, navigate to 192.168.7.2, select the network configuration tab and enter the desired IP address.
- Using a laptop and the low level socket API, send the "ethernet configuration commands" to set the desired static IP commands.
- Use a pendant to connect to the Machine Motion control center, select the network configuration tab and enter the desired IP address.

Device	MachineMotion Connector
Port	9999
Controller IP using Default Ethernet Connector	192.168.7.2
Controller IP using Ethernet Connector	Configurable when connected using 192.168.7.2 port

Opening a Connection

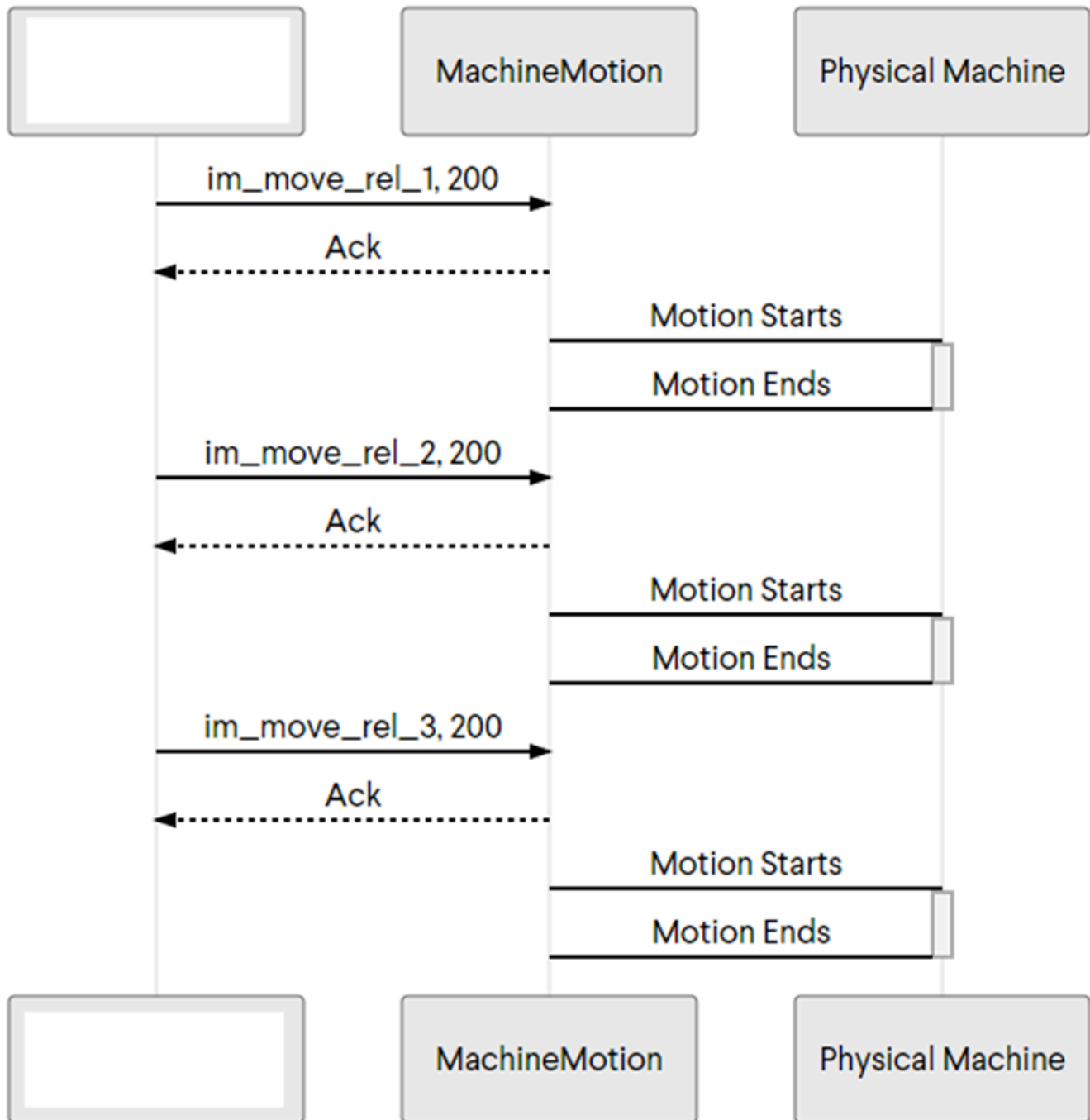
A connection must be opened before any commands can be sent or received from the MachineMotion ethernet port. How to open a connection will depend on the programming language being used. Once the connect is open, the MachineMotion will respond with "MachineMotion connection established". It is recommended the first command sent is `isReady` to confirm a properly established connection. The message sequence chart below show the expected commands and responses.



Opening a Connection Communication Diagram

Immediate Functions

Immediate function commands are executed by the MachineMotion controller as soon as they are received by the MachineMotion controller. The message sequence chart below describes the messaging sequence for the "Immediate Relative Move" commands. The left most column represents any client capable of sending messages over Ethernet TCP/IP.



Immediate Functions Communication Diagram

is Ready



is Busy



is Motion Completed



Immediate Stop



Set All Axes Speed



Set All Axes Acceleration



Immediate Home Axis



Immediate Home All



Get Position



Set Position



Immediate Relative Move



Immediate Absolute Move



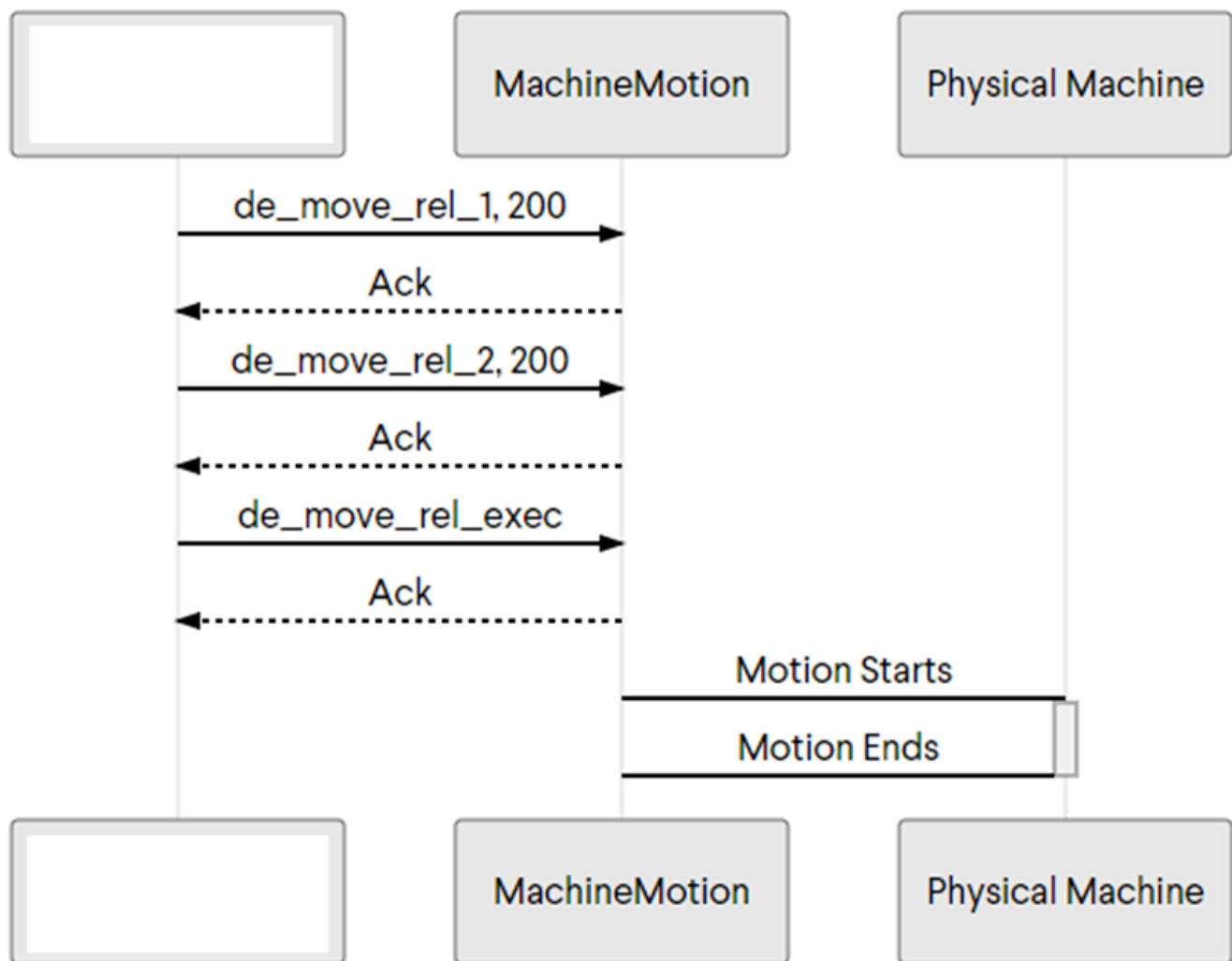
Define IP Address



Set Encoder**Read Encoder****Read Digital Input****Write Digital Output****Read E-Stop Status****Trigger E-Stop****Release E-Stop****System Reset****Move to Closest Angle****Continuous Move**

Delayed Functions

Delayed commands will be completed by the controller once a corresponding "execute" command is sent. This enables controlling synchronous axis movements by executing several previously sent "delayed" commands simultaneously with an "execute" command. The message sequence chart below illustrates this message sequence process.



Delayed Functions Communication Diagram

Delayed Absolute Move



Delayed Absolute Move Execute



Delayed Relative Move



Delayed Relative Move Execute



Delayed Configure Microsteps



Delayed Configure Mechanical Gain



Delayed Configure Direction



Delayed Configure Execute

