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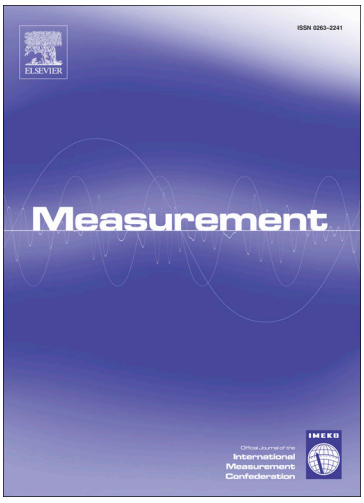

A new method for motion synchronization among multivendor's programmable controllers

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PII: S0263-2241(18)30440-8
DOI: https://doi.org/10.1016/j.measurement.2018.05.050
Reference: MEASUR 5551

To appear in: *Measurement*

Received Date: 12 October 2017
Revised Date: 10 May 2018
Accepted Date: 11 May 2018

Please cite this article as: J.C. Camargo Molano, A. Lahrache, R. Rubini, M. Cocconcelli, A new method for motion synchronization among multivendor's programmable controllers, *Measurement* (2018), doi: https://doi.org/10.1016/j.measurement.2018.05.050

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A new method for motion synchronization among multivendor's programmable controllers

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Abstract

This paper is aimed at increasing the number of possible architectures of distributed control systems by investigating and developing novel methods for the synchronization of axes between PLCs and iPCs of different vendors. In order to find a global solution to this problem, particular attention has been focused on programmable controllers that can manage axes by means of point-by-point control or motion instructions.
Two synchronization algorithms have been developed and validated for real and virtual axes; they differ in computational load so that they can be used with programmable controllers having high or low computational performances.

Keywords: Synchronization, Coordinated motion control, Real-Time Ethernet network, Multi-axis motion

1. Introduction

Distributed solutions for real-time system architectures are more and more used for the improvement of the industrial process and the development of smart factories in order to follow the new wave of Industry 4.0 [1]. In comparison with the centralized architecture, these systems improve the dependability, compensability, scalability and extensibility of the products [2]. They are also called networked motion control systems (NMCSs) and they consist of a set of different nodes such as controllers, sensors, drive controllers, regulators, HMIs and actuators, spatially distributed and interconnected by a communication network [3, 4].

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