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(54) Title: A METHOD FOR CONTROLLING A PROCESS PLANT USING A REDUNDANT LOCAL SUPERVISORY CONTROLLER

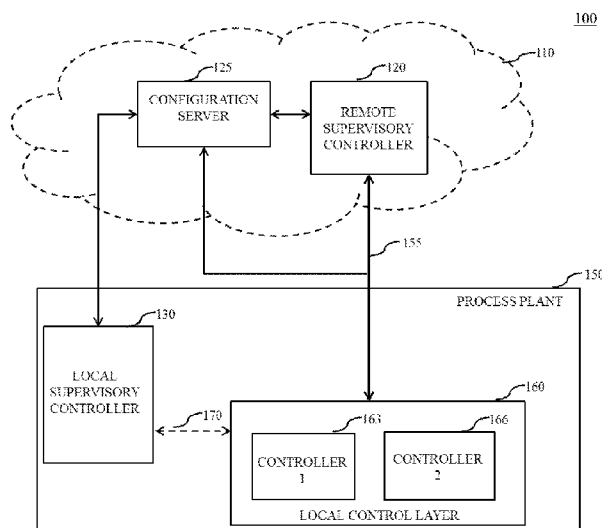


Figure 1

(57) Abstract: The present invention discloses a method for controlling a process using a plurality of regulatory controllers (160) connected to a remote supervisory controller (120) over a communication link (155) and to a local supervisory controller (130) over a process bus (170). The remote supervisory controller (120) controls the regulatory controllers (160) over the communication link (155) with the use of a remote process model. During operation of the plant a local process model is configured in the local supervisory controller (130) with control data send on the communication link (155). Upon failure of the communication link (155) the local supervisory controller (130) takes over the control through the process bus (170), acting as a redundant or a backup controller. The method comprises: monitoring transmission of control data between the remote supervisory controller (120) and the plurality of controllers (160) over the communication link (155); determining functional correlations between measured process variables and control process variables, based on the control data and a predetermined correlation function; configuring local process model based on the determined functional correlations; and providing intermediate set points using the configured local process model, upon an intermediate failure of the communication link (155), where the communication link recovers from the intermediate failure within a predetermined time period.



INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
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 According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
 Minimum documentation searched (classification system followed by classification symbols)
 G05B
 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
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C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2005/004684 A1 (CRIBBS TIMOTHY B [US]) 6 January 2005 (2005-01-06) paragraph [0021] - paragraph [0039] paragraph [0073] - paragraph [0076] -----	1-8
A	US 2013/285799 A1 (PROBIN ROBERT JOHN [GB] ET AL) 31 October 2013 (2013-10-31) paragraph [0021] - paragraph [0040]; figures 1-4 -----	1-8
A	US 2007/142936 A1 (DENISON DAVID R [US] ET AL) 21 June 2007 (2007-06-21) paragraph [0011] - paragraph [0014] paragraph [0026] - paragraph [0033] paragraph [0053] -----	1-8
A	EP 2 293 159 A1 (ABB RESEARCH LTD [CH]) 9 March 2011 (2011-03-09) paragraph [0014] - paragraph [0061] -----	1-8

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See patent family annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005004684	A1	06-01-2005	NONE
US 2013285799	A1	31-10-2013	CA 2813983 A1 26-10-2013
			GB 2503543 A 01-01-2014
			US 2013285799 A1 31-10-2013
US 2007142936	A1	21-06-2007	CN 101196740 A 11-06-2008
			DE 102007046964 A1 21-05-2008
			GB 2442591 A 09-04-2008
			HK 1112074 A1 11-05-2012
			JP 5657854 B2 21-01-2015
			JP 5730952 B2 10-06-2015
			JP 2008090845 A 17-04-2008
			JP 2013225333 A 31-10-2013
			JP 2015046180 A 12-03-2015
			JP 2015072714 A 16-04-2015
			US 2007142936 A1 21-06-2007
			US 2010228363 A1 09-09-2010
EP 2293159	A1	09-03-2011	CN 102483611 A 30-05-2012
			EP 2293159 A1 09-03-2011
			US 2012226367 A1 06-09-2012
			WO 2011026734 A1 10-03-2011