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13/236,002 19 September 2011 (19.09.2011) US(71) Applicant (for all designated States except US): **ROSE-MOUNT, INC.** [US/US]; 12001 Technology Drive, Eden Prairie, MN 55344 (US).

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(54) Title: DEGRADING SENSOR DETECTION IMPLEMENTED WITHIN A TRANSMITTER

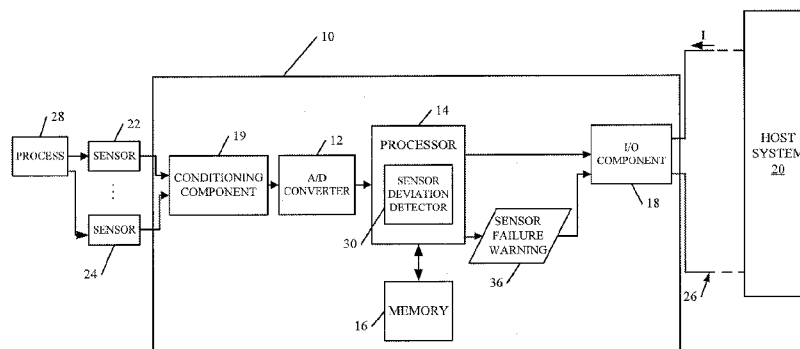


FIG. 1

(57) **Abstract:** A process variable transmitter (10) includes a memory (16) that stores a filtered sensor value that is calculated based on a prior received sensor value and a filtered rate of change value that is calculated based on a prior rate of change value. The process variable transmitter (10) also includes a controller (14) that receives a sensor value and compares it to the filtered sensor value to obtain a rate of change value. The controller (14) also compares the rate of change value to the filtered rate of change value to obtain a deviation value, and generates an output indication, such as a sensor failure warning output, based on the deviation value. This is done within the process variable transmitter (10).



INTERNATIONAL SEARCH REPORT

International application No

PCT/US2012/027409

A. CLASSIFICATION OF SUBJECT MATTER
INV. G05B23/02
ADD.

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)

EP0-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 017 143 A (ERYUREK EVREN [US] ET AL) 25 January 2000 (2000-01-25) column 2, line 65 - column 5, line 67 column 7, line 27 - column 8, line 21 figures 1-3 -----	1-7, 10-14, 17,18
X	US 2008/082294 A1 (PIHLAJA ROGER K [US] ET AL) 3 April 2008 (2008-04-03) paragraph [0056] - paragraph [0065] paragraph [0076] - paragraph [0079] paragraph [0084] - paragraph [0086] paragraph [0170] - paragraph [0176] figures 1,2,5,11,18a,18b -----	1-7, 10-14, 17,18

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

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17/10/2012

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/027409

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

see annex

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2012/027409

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6017143	A	25-01-2000	BR 9702223 A	23-02-1999
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FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-7, 10-14, 17, 18

Sensor failure detection based on measurements preprocessing

2. claims: 8, 9, 15, 16, 19, 20

Multiple sensors data correlation analysis
