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61/476,145 15 April 2011 (15.04.2011) US
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- (81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
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(54) **Title:** ADVANCED ANALYTE SENSOR CALIBRATION AND ERROR DETECTION

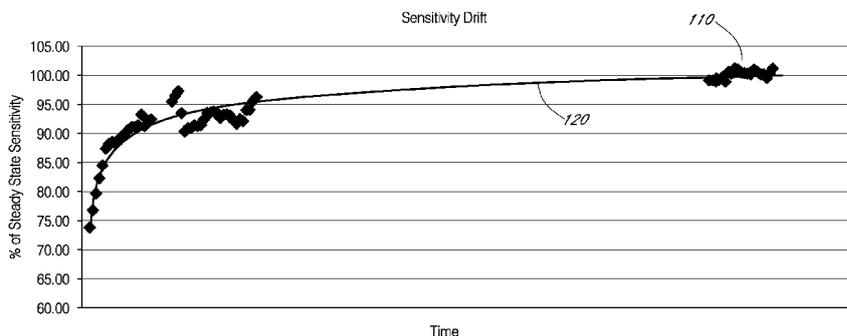


FIG. 1A

(57) **Abstract:** Systems and methods for processing sensor data and self-calibration are provided. In some embodiments, systems and methods are provided which are capable of calibrating a continuous analyte sensor based on an initial sensitivity, and then continuously performing self-calibration without using, or with reduced use of, reference measurements. In certain embodiments, a sensitivity (110) of the analyte sensor is determined by applying an estimative algorithm (120) that is a function of certain parameters. Also described herein are systems and methods for determining a property of an analyte sensor using a stimulus signal. The sensor property can be used to compensate sensor data for sensitivity drift, or determine another property associated with the sensor, such as temperature, sensor membrane damage, moisture ingress in sensor electronics, and scaling factors.



INTERNATIONAL SEARCH REPORT

International application No.
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A. CLASSIFICATION OF SUBJECT MATTER		
<i>G01N 33/66(2006.01)i, A61B 5/157(2006.01)i</i>		
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) G01N 33/66; A61B 5/05; A61B 5/145; G06F 19/00; A61B 5/00		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Korean utility models and applications for utility models Japanese utility models and applications for utility models		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) eKOMPASS(KIPO internal) & Keywords: sensor, iterative, calibration, analyte, sensitivity, a priori information		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 2009-0143659 A1 (LI, YING et al.) 04 June 2009 See fig. 14; paragraphs 91, 98, 99, 133, 134, 765; claims 1, 8, 13-15.	1-4,6,8-9,11,25-26 ,28-29,31-32,34 5,7,10,12-24,27,30 ,33,35-115,118-189
A	US 2010-0274107 A1 (BOOCK, ROBERT et al.) 28 October 2010 See abstract; paragraph 109; claim 1.	1-115,118-189
A	US 7299082 B2 (FELDMAN, BENJAMIN J. et al.) 20 November 2007 See abstract; fig. 1B; claims 1, 26, 28.	1-115,118-189
A	US 2011-0029269 A1 (HAYTER, GARY ALAN et al.) 03 February 2011 See abstract; claims 14, 15, 20.	1-115,118-189
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> 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 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 23 OCTOBER 2012 (23.10.2012)		Date of mailing of the international search report 23 OCTOBER 2012 (23.10.2012)
Name and mailing address of the ISA/KR  Korean Intellectual Property Office 189 Cheongsu-ro, Seo-gu, Daejeon Metropolitan City, 302-701, Republic of Korea Facsimile No. 82-42-472-7140		Authorized officer KANG, HEE GOK Telephone No. 82-42-481-8264 

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2012/033645**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.: 193-195
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:

claims 193-195 are contrary to PCT Rule 6.2(a) because they rely on unnecessary to the description and/or drawings.

3. Claims Nos.: 116, 117, 190-192
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:

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 fee, this Authority did not invite payment of any additional fee.

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.:

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.

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