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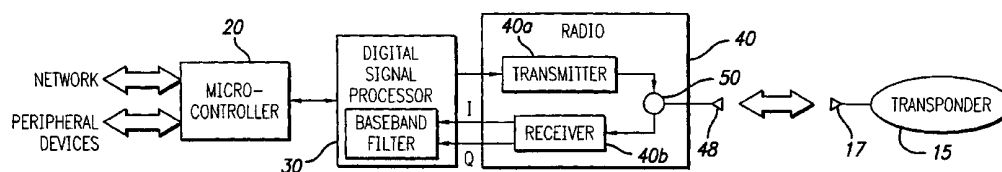
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- (71) Applicant: INTERMEC IP CORP. [US/US]; 21900 Burbank Boulevard, Woodland Hills, CA 91367-7418 (US). (88) Date of publication of the international search report: 1 February 2001
- (72) Inventors: CHIEU, Trieu, C.; 100 Dunwoodie Street, Scarsdale, NY 10583 (US). ZAI, Li-Cheng; 106 Lester Lane, Los Gatos, CA 95032 (US). For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.



(54) Title: DATA RECOVERY SYSTEM FOR RADIO FREQUENCY IDENTIFICATION INTERROGATOR



(57) Abstract: An RF/ID interrogator (10) is provided for recovering a data signal from an RF/ID tag (15). The interrogator (10) includes a radio (40) having a receiver portion (40b) to receive in-phase (I) and quadrature-phase (Q) signals from the RF/ID transponder (15) transmitted at a predetermined bit-rate, and a processor (30) coupled to the radio for controlling operation of the radio in accordance with stored program instructions. In one embodiment, the interrogator (10) performs over-sampling of the data signal received from the RF/ID tag (15) in order to provide a high data recovery rate. In another embodiment, the interrogator (10) performs a selection between the I and Q signals in order to achieve optimum data recovery.

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/10916

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G06K7/00

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)
IPC 7 G06K H04L

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 practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 648 765 A (PLANT JR EDWARD G ET AL) 15 July 1997 (1997-07-15) column 5, line 57 -column 6, line 21 figure 1 ---	1,16
A	US 5 668 803 A (TYMES LAROY ET AL) 16 September 1997 (1997-09-16) column 21, line 65 -column 22, line 31 ---	1,16
A	US 5 235 326 A (MALM ROBERT E ET AL) 10 August 1993 (1993-08-10) column 9, line 41 -column 10, line 44 -----	1,16

Further documents are listed in the continuation of box C.

Patent family members are listed in 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 document 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

4 August 2000

Date of mailing of the international search report

16. 11. 2000

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 00/10916

Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 II Observations where unity of invention is lacking (Continuation of item 2 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 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.:

1-29

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. Claims: 1-29

An apparatus and a method for recovering a data signal transmitted from an RF/ID transponder, wherein the signal is sampled at a sampling rate higher than a bit-rate, comparing relative polarity of successive ones of the signal samples and deriving data bits from the successive ones of the signal samples in correspondence with predetermined ranges of numbers of successive ones of the signal samples having same polarity.

2. Claims: 30-53

An apparatus and a method for receiving a data signal transmitted from an RF/ID transponder, detecting relative signal strength of I and Q signals, selecting at least one of the I and Q signals for subsequent processing based on the detected relative signal strength and recovering the data bits from the selected one of the I and Q signals.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/10916

Patent document cited in search report	A	Publication date	Patent family member(s)	Publication date
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