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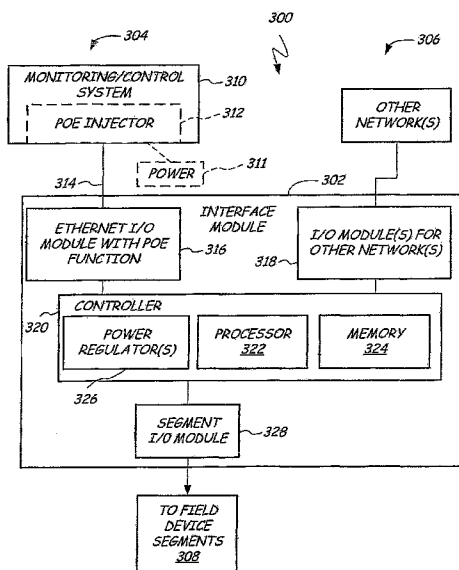
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- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
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Published:  
— with international search report

[Continued on next page]

(54) Title: INTERFACE MODULE WITH POWER OVER ETHERNET FUNCTION



(57) Abstract: An interface module (302) for use in a process monitoring and control system has an Ethernet port, a controller (320), and at least one segment I/O module (328). The Ethernet port is adapted to send and receive signals in an Ethernet protocol over a cable (314) comprising a plurality of wires and to receive a voltage potential from at least one pair of the plurality of wires. The controller (320) is coupled to the Ethernet port and powered from the received voltage potential. The at least one segment I/O module (328) is coupled to the controller (320) and is adapted to couple to an associated field device segment (308) with at least one attached field device. The at least one segment I/O module (308) is adapted to interact with the at least one attached field device on the associated field device segment.

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21 June 2007

*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.*

# INTERNATIONAL SEARCH REPORT

International application No

PCT/US2006/028065

**A. CLASSIFICATION OF SUBJECT MATTER**  
 INV. H04L12/10

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)  
 H04L H04B

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

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00/64099 A2 (INVENSYS PLC [US]; KEYGHOBAD SEYAMAK [US]; BAKER WILLIAM [US]; THIBAUL) 26 October 2000 (2000-10-26) page 1, line 1 - page 6, line 6; figures 3,4,9,10	1-8, 16-21
A	----- US 6 140 911 A (FISHER DAVID A [US] ET AL) 31 October 2000 (2000-10-31) figure 1 -----	1-8, 16-21

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 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

8 January 2007

Date of mailing of the international search report

28.03.07

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Authorized officer

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# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2006/028065

## Box 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 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 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 - 8, 16 - 21

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: 1-8,16-21

An interface module which is powered over the Ethernet bus,  
and coupled to at least one field device.

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2. claims: 9-15

A system for monitoring and controlling an industrial  
process.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2006/028065

Patent document cited in search report	Publication date	Publication date	Patent family member(s)	Publication date
WO 0064099	A2	26-10-2000	AU 4241300 A	02-11-2000
			EP 1171975 A2	16-01-2002
			US 6640308 B1	28-10-2003
US 6140911	A	31-10-2000	WO 9854843 A1	03-12-1998
			US 5994998 A	30-11-1999