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(71) Applicant and

(72) Inventor: ENRIQUEZ, Ishmael [US/US]; 5714 Honey-bee Bend, Austin, TX 78744 (US).

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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: WIDE AREA NETWORK AS APPLIED TO SWITCHYARD/SUBSTATION CONTROL DESIGN

(57) Abstract: An improved system for a substation relaying and control wide area network based on a SONET or T carrier (Small Site) communication concept. In the WAN, every device (190-340, 410 and 480) at the substation or plant can be networked. This design concept offers many benefits including: every secondary signal, such as control, alarm, and indications signals, can be digitized; SCADA equipment can be interfaced or replaced in the WAN; metering equipment can be interfaced to the SONET protocol without actual secondary values at inputs to control house meter; panel device(s) footprint reducing the control housing dimensions; stub-up conduit quantity for the power equipment can be reduced thereby reducing labor and material costs; reliability and security can be increased; fault monitoring will be simplified; surveillance can be more practical; and site to site communication can be approached with leased satellite space as optional communications.



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/02862

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H04J 4/00
US CL : 370/478,535

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)
U.S. : 370/478,535

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)
Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,002,996 A (BURKS et al) 14 December 1999, see entire document.	
A	US 5,005,142 A (LIPCHAK et al) 2 April 1991, see entire document.	
A	US 5,687,391 A (JUDD et al) 11 November 1997, see entire document.	
A	US 5,623,565 A (BLAIR et al) 22 April 1997, see entire document.	
A	US 5,408,176 A (BLATT) 18 April 1995, see entire document.	
A	US 5,705,929 A (CARAVELLO et al) 6 January 1998, see entire document.	
A	US 5,680,239 A (LIVA et al) 21 October 1997, see entire document.	
A	US 5,706,278 A (ROBILLARD et al) 6 January 1998, see entire document.	



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	"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
"E" earlier application or patent published on or after the international filing date	"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
"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)	"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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

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Date of mailing of the international search report

04 MAR 2004

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Commissioner for Patents
P.O. Box 1450
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Facsimile No. (703)305-3230

Authorized officer

Huy Vu

Telephone No. (703)305-3900

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/02862

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

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

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claim Nos.: 1-8
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:
Please See Continuation Sheet
3. ☐ Claim 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:

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.

No protest accompanied the payment of additional search fees.

Continuation of Box I Reason 2:

Claims 1 and 2 do not include written limitations which clearly define the invention. Rather the claims define the invention through the use of drawings. In order for a meaningful search to be conducted on the claims, the claims should define the metes and bounds of the invention through written limitations, such as "An apparatus for communicating information, comprising: a multiplexor, a digital cross connect, channel banks, and fiber optic links". Claims 3-8 appear to be dependent claims; however, claims 3-8 do not contain a statement of dependency. These claims should be amended to clearly state whether the claims are dependent claims, and, if so, what claims claims 3-8 depend upon. In addition, claims 3-8 should contain clearer limitations since terminology such as "included are any" is vague and indefinite.

Continuation of B. FIELDS SEARCHED Item 3:

EAST

search term: SONET, sensor, actuator, switchyard