Title: METHOD FOR CONTROLLING REMOTE INSTALLATIONS

Abstract: A method for remotely controlling installations such as process plants, power plants, electrical installations, etc., through a data processing network, in particular, through a data processing network (1) with TCP/IP protocol, said installations comprising appliances such as process variables measuring instruments (6b) and actuating devices of valves, motors, pumps or the like. The method provides prearranging a server (2) wherein a gateway is resident, the gateway being connected to a first port that has a public static IP address and that can be seen within network (1), associating peripheral devices (4) to respective appliances (6b) and supervision units (3) to each user of the control. Each terminals, i.e. a peripheral device (4) and/or a supervision unit (3), requires and obtains a dynamic IP address (40) and is granted to access network (1) by a LAP. Then, a request of a connection to the gateway of server (2) is carried out by the terminal through the first port. The connection is accepted by the gateway of server (2), which stores terminal IP address (40) of the terminal. Afterwards, the gateway asks and obtains from the terminal a proper identification code (44), and stores terminal IP address (40) and identification code (44) in a record of a table of correspondence (15). Whenever a query (41) or a command is submitted by a supervision unit (3) towards a peripheral device (4), or data are sent by a peripheral device (4) to a supervision unit (3), the gateway uses addresser (4) identification code (44) and table of correspondence (15) to retrieve IP address (40) to which query (41) data must be redirected to reach desired peripheral device (4) or supervision unit.
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METHOD FOR CONTROLLING REMOTE INSTALLATIONS

DESCRIPTION

Field of the invention

The present invention relates to a method for controlling remote installations through data processing networks. The installations can comprise equipment such as process variables sensors, actuators of mechanical and electric devices, such as valves, motors, pumps or the like.

The term control refers to functions such as: acquisition of data to be displayed and/or recorded in a user interface, alarms and blocks generation, as well as regulation functions.

For instance, the method according to the invention can be used for remotely supervising process plants, such as chemical installations and the like, power stations, waste treatment plants, hydraulic, mechanical, electric installations, and so on.

Background of the invention

The well known remote control methods provide a step of establishing and maintaining a communication between a group of terminals, i.e. a group comprised of:
- at least one peripheral device associated with an equipment, and
- at least one supervision unit, that may be arranged at a user's remote control station.

Such remote control systems, among which the most common are SCADA and DCS, require connections among the terminals, in order to form a local area network (LAN) or an extended area network (WAN), according to whether a single installation or several installations must be controlled.
The communication can be carried out by means of:
- cables, such as telephone cables, associated with a modem device;
- UHF and VHF radio waves, via proprietary networks comprising one or more radio and/or GSM links connected with public networks;
- internet and intranet: the terminals reach the data processing network through public networks, still by means of cables, modem and/or radiofrequency.

PSTN or ADSL connections are cable connections that use, respectively, an analog or a digital modem device, whereas for GPRS and UMTS systems radiofrequency connections are normally used.

These methods provide, furthermore, a step where the terminals are identified by means of telephone numbers, radio addresses, IP addresses or the like. An IPv4 address is a succession of four numbers set between 0 and 255: the amount of IPv4 addresses which can be generated is less and less adequate due to the more and more widespread use of Internet as a means for connecting remote-controlled terminals. Various solutions have been proposed to overcome the problem, among which:
- switching to IPv6, which is a version of TCP/IP protocol in which six numbers instead of four are used to form an IP address: this is however a long and expensive process;
- NET/Gateway, a method that can be still based on IPv4 dynamic addresses. A dynamic IP address is allocated to a terminal at the beginning of a connection and identify the terminal only as long as the connection is running: therefore, a dynamic IP address identifies a connection, and not a connected terminal. On the contrary, a static IP address is invariably associated with a determined terminal, that is always identified with the same address
whenever it is connected to the network. NET/Gateway is already largely used in common Internet and mobile phone connections: GPRS/UMTS and PSTN, as well as private ADSL, use dynamic IP addresses. A dynamic IP address can be used in subsequent connections to identify even different terminals, provided the terminals are not permanently connected to the data processing network.

Therefore, fewer dynamic IP addresses are required to identify a predetermined group of terminals, if dynamic addresses are used together with static addresses. Nevertheless, the use of dynamic IP addresses to identify terminals in a remote supervision system has some important drawbacks.

In particular, data packets, which are sent by a same peripheral device either to a user or to a control device in successive connections, must be adapted to build up coherent sets of data concerning that peripheral device; in other words an unambiguous identification of the peripheral device must be guaranteed. For example, a user of a remote plant control system must be enabled to assign univocally data displayed in a specific display device to one prefixed peripheral device, in particular a measuring instrument. Similarly, to build up a process variable trend plot by appending data received from one sensor in subsequent connections, an univocal identification of the sensor is needed whenever the trend plot is updated. This is clearly impossible if only dynamic IP addresses are used. Moreover, a terminal connected to a network that is identified by merely using an IP address, in particular a dynamic one, remains unseen to the other terminals, to which the IP address is unknown; therefore, a communication between peripheral devices is not possible.

So far, no satisfactory solutions are known which is able to overcome these limitations.
Summary of the invention

It is therefore a feature of the present invention to provide a method for remotely supervising installations through data processing networks, in which both the peripheral devices that are associated with the equipment of the installations and the supervision units receive a dynamic IP, and are also univocally identified.

It is another feature of the present invention to provide such a method in which no additional devices are required to retransmit the data that are sent by a the peripheral device and are addressed to another equipment of the installation.

It is still a feature of the present invention to provide such a method by which plants can be controlled such as aqueducts, oil and gas pipelines, chemical plants, power station, large industrial/process plants in general.

These and other objects are achieved through a method for remotely controlling an appliance of a plant by a user through a data processing network, in particular a data processing network with a TCP/IP protocol, said method providing the steps of:

- providing a supervision unit for said user;
- associating a peripheral device to said appliance;
- prearranging a server, said server comprising a program means, hereinafter called gateway, said gateway connected to a first port of said server, said first port having a public static IP address that is visible within said data processing network;
- requesting an access into said data processing network by a terminal, said terminal selected from the group comprised of:
  - said supervision unit associated with said user,
  - said peripheral device associated with said appliance;
allocating a dynamic IP address and allowing to said terminal said access into said processing network; wherein the main feature of the method is that it provides, furthermore, the steps of:

- requesting a connection to said gateway by said terminal through said first port;
- accepting the connection and storing said dynamic IP address by said gateway;
- requesting by the gateway to the terminal a terminal identification code;
- sending said terminal identification code to said gateway by said terminal;
- storing by the gateway both said dynamic IP address and said terminal identification code in a correspondence table which has respective records consisting of said dynamic IP addresses on the one hand and said terminal identification codes on the other hand.

This way, whenever a specific terminal gets connected to the processing network, the gateway updates the table of correspondence between the respective dynamic IP addresses and the terminal identification codes, by adding the correspondence between the dynamic IP addresses that have been just allocated to the specific terminal, and the identification code of that terminal. A connecting procedure, that comprises the above-mentioned steps allows many terminals to communicate with one another even if they don't have static, i.e. permanent, IP addresses that steadily indentify each of them: in fact, to this purpose they only need to reach the gateway through the data processing network and the first port of the server.

Advantageously, the method provides a data-querying procedure comprising the steps of:
- submitting a query of data by a user about a desired peripheral device, said query being submitted to the
gateway by said supervision unit, said query being submitted also indicating said terminal identification code of said desired peripheral device;
- searching the current IP address of said desired peripheral device, said searching step being carried out by the gateway in said correspondence table;
- forwarding by said gateway said query to said peripheral device by using said IP address, and enabling said user to collect data concerning said appliance.

Advantageously, the method comprises the step of requesting by a peripheral device a transmission of data to a supervision unit, said requesting step being submitted to the gateway by said peripheral device, said requesting step being associated to the terminal identification code of said supervision unit.

Moreover, the method can comprise the steps of:
- searching the current IP address of said supervision unit, said searching step being carried out by the gateway in said correspondence table;
- forwarding by said gateway said data to said supervision unit.

The above-listed steps of requesting a transmission of data by a specific peripheral device, and a subsequent step of searching the IP address and forwarding data to a designed supervision unit, provide a data transmitting procedure from a peripheral device to a supervision unit which may be related to a previous data querying procedure between the designed supervision unit towards the specific peripheral device.

The above-described communication procedures between a supervision unit and a peripheral device, by which a query of data is submitted and forwarded by a supervision unit to a peripheral device, and data are sent from a peripheral device to the gateway and possibly sent back to
a supervision unit, can be made by associating the query and the data to a header that contains the identification code of the addressee and the identification code of the sender, and by associating said identification codes in a TCP/IP packet. This TCP/IP packet is sent to the server preferably by means of an existing dynamic IP address, i.e. by a previously established connection.

Preferably, said server comprises:
- a program means called the master;
- a data recording area, also called database, said database being associated with a second port of the server, and said method provides a procedure of data processing by said master comprising the steps of:
  - transferring data from said gateway to said master, said master thus receiving transferred data;
  - selecting relevant data from said transferred data;
  - recording said relevant data in said database;
  said selecting and said recording steps being carried out by said master.

The above mentioned step of requesting a transmission of data by a specific peripheral device, together with a subsequent procedure of processing these data by the master, as above described, forms a procedure of storing data into the database.

Advantageously, the method provides a step of transmitting data from said database to a predetermined recipient supervision unit through said second port of the server.

According to the method as described so far, a user can get data concerning an appliance following a request of data formulated by any user. Similarly, relevant data can be selected and stored in the database under a request formulated by any user. Afterwards, the stored data can be
possibly recovered by any supervision unit under a request submitted by the supervision unit to the gateway.

Data may be also sent from a peripheral device to a supervision unit according to a scheduled programme or following the occurrence of prefixed conditions.

To this purpose, the method can comprise a step of fixing a schedule by a user, said schedule comprising time limits at the expiration of which a desired action has to be performed, said desired action being in particular the execution of a procedure selected within the data transmitting procedure or the data storing procedure, or both, as above described.

This way, data concerning an appliance of the installation can be obtained by a user, or stored in the database, according to a predetermined programme. More in detail, data concerning a peripheral device can be sent to a user or stored into the database whenever a prefixed condition occur; this condition may be exceeding a threshold limit of a process variable, as in the case of an alarm condition, and/or may be the expiration of a scheduled time limit, as in the case of sampling data of a process variable to build up a trend plot of that variable.

Preferably, said schedule is stored at said peripheral device.

Said schedule can comprise time limits which are programmed at prefixed time intervals, said time intervals defining for example a frequency of sampling and of data transmission from said peripheral device.

The method can also provide a step of defining alarm conditions, said step of defining being carried out by a user preferably by means of a supervision unit, in particular said alarm conditions being selected from the group comprised of:
- exceeding a prefixed threshold value of a process variable;
- lack of confirmation of the execution of a command previously sent to a peripheral device associated with an actuator, in particular after a predetermined number of iterations of said command;
- lack of confirmation of receipt of a command sent to a peripheral device, wherein a desired action has to be performed at the occurrence of such an alarm condition, said desired action being in particular the execution of a procedure selected within the data transmitting procedure or data storing procedure, or both, as above described.

Preferably, said alarm conditions are stored in said peripheral device.

Advantageously, the method provides:
- a step of defining by a user an automatic controlling condition, said step preferably carried out by means of a respective supervision unit;
- a step of automatically generating a command, i.e. a control signal, when said automatic controlling condition occur, wherein said command is sent from a master peripheral device to a slave peripheral device; said master peripheral device associated with an instrument suitable for detecting said automatic controlling condition, in particular with a measuring device of a process variable, said slave peripheral device associated with an actuating device of an appliance.

Therefore, a master peripheral device, in particular one which is associated with a measuring instrument, can autonomously perform a procedure of automatically controlling a slave peripheral device, said procedure comprised of said steps of defining an automatically
controlling conditions and of automatically generating a command. The automatically controlled peripheral device may be associated with a valve actuator, a start/stop device of a motor of an appliance, and so on. Alarms and control signals can be exchanged directly between peripheral devices; the server can in any case notify to a user, and/or can record in the database, events and/or alarm conditions which take place during a procedure of automatically controlling slave peripheral devices, according to the above.

Preferably, said control signals between said master peripheral device and said slave peripheral device are sent by means of radio waves, in particular VHF and UHF radio waves.

Preferably, said step of generating said command is repeated with a predetermined frequency, as long as said condition or said event, which has caused said command, is present.

Preferably, the method provides, a step of disabling said step of automatically generating a command, said step of disabling carried out by a user preferably by means of a supervision unit.

Furthermore, the method can provide the steps of:
- submitting a request of transmission of a command, i.e. a control signal, to a slave peripheral device, said request being submitted to the gateway by said supervision unit, said request being submitted indicating said terminal identification code of said slave peripheral device;
- searching the current IP address of said slave peripheral device, said searching step being carried out by the gateway in said correspondence table;
- forwarding by said gateway said command to said slave peripheral device by using said IP address.
This way, a user is enabled to perform a procedure of directly controlling any actuating device of an appliance of the installation that is associated to a peripheral device, by submitting a specific command, said procedure comprised of said steps of submitting a request of transmission of a command, of searching the current IP of the submitting peripheral device and said step of forwarding the command. By such a procedure, the user can operate for example an actuator for changing the status of an appliance served by an electric device, such as a pump or a stirrer, or can open or close a valve and so on.

In particular, the connection of the peripheral device with the data processing network is carried out by a means selected from the group comprised of:

- Ethernet;
- GPRS, in which case the dynamic IP address is provided by an internet access (or service) provider, i.e. a IAP;
- radio waves, in particular UHF or VHF radio waves, in which case a step is provided of converting a RF signal into Ethernet or into GPRS.

In particular, the connection of the supervision unit to the data processing network is carried out by a means selected from the group comprised of:

- Ethernet;
- GPRS;
- ADSL;
- PSTN.

In the latter three cases the IP address being allocated by a IAP.

**Brief description of the drawings**

The invention will be made clearer with the following description of an exemplary embodiment thereof, exemplifying but not limitative, with reference to the
attached drawings wherein:
- Figure 1 represents diagrammatically a data processing network for remotely controlling a plant, according to the invention;
- Figure 2 represents diagrammatically a sequence of requesting and obtaining an access of a terminal to the data processing network, in a procedure of connecting a terminal to the network;
- Figures 3a and 3b represent diagrammatically a step of univocal identification of a terminal in a procedure of connecting a terminal to the network;
- Figure 4 represents diagrammatically the procedures of data querying and directly controlling a terminal by a supervision unit;
- Figure 5 represents diagrammatically the procedure of transmitting and/or storing data from a peripheral unit to a supervision unit and/or the database;
- Figure 6 represents diagrammatically the procedure of automatically controlling a slave peripheral device by a master peripheral device.

Description of preferred exemplary embodiments

Referring to Figure 1, a data processing network 1 with a TCP/IP protocol is used for remotely controlling an installation comprising appliances 6a and 6b. A server 2 is connected to data processing network 1, and it has a first port 12 and a second port 17 that can be reached within the network by means of respective public and static TCP/IP addresses.

Also connected to data processing network 1 there are:
- one or more supervision units 3 which provide an interface with respective users, not shown;
- one or more peripheral devices, that may be master peripheral devices 4 or slave peripheral devices 5, associated with respective appliances of the installation.
In particular, master peripheral devices 4 are associated with appliances 6b that are suitable for detecting process variable values or events, while slave peripheral devices 5 are associated with actuating devices 6a, for example valve actuators, electric drive start/stop devices, or the like.

Supervision units 3 are connected to network 1 by means of respective ADSL modem devices 7. Peripheral devices 4 are connected to network 1 by means of respective GPRS devices that are integrated within the peripheral devices, while peripheral devices 5 use respective radio connections which require further peripheral radio/GPRS interface devices 18 for the connection to network 1.

The server 2 comprises:
- a gateway 11 which dialogues with terminals 3, 4 and 5 through port 12;
- a master 13, which receives and selects data from gateway 11;
- a database 14, in which master 13 records data, for example a process variables trend 15 and an alarms and events data survey 16. The database is accessible by a port 17.

An embodiment of the method according to the invention is described below. Supervision units 3 and peripheral devices 4 are connected via a GPRS connection, but the below described steps and procedures applies to connections carried out by means of any means selected from the group comprised of Ethernet ADSL PSTN, an so on.

In particular, a procedure of connecting a terminal to data processing network 1, is carried out preliminarily to any data exchange between the terminals. With reference to figures from 2 to 3B, a procedure of connecting a master peripheral device 4 to data processing network 1 is
described. Master peripheral device 4 is previously-associated with an appliance 6b and has a proper terminal identification code 35.

Peripheral device 4 submits a request 21 for an access into processing network 1. The access is obtained by an internet service provider 8, also called a IAP, by allocating peripheral device 4 to a dynamic internet address 10 through an access acceptance confirmation 22. Request 21 and confirmation 22 are exchanged between peripheral device 4 and data processing network 1 by means of radio waves, which require a conversion device 9.

Once connected to the data processing network 1, peripheral device 4 submits a request of connection 31 (figure 3A) to gateway 1 (figure 1) that is resident in server 2. To this purpose, the request of connection 31 is sent to first port 12 of server 2, and hence to gateway 11. Subsequently, gateway 11 accepts the request of connection 31 and stores dynamic IP address 10 in a respective record of a correspondence table 15 and sends an acceptance message 32 to peripheral device 4. At this point (figure 3B) the gateway 11 sends a request 33 of a proper identification code to peripheral device 4, which delivers a response 34 with the required identification code 35. Gateway 11 stores terminal identification code 35 of peripheral device 4 into the same record of correspondence table 15.

A similar connecting procedure can be followed to connect a slave peripheral device 5 or a supervision unit 3 instead of a master peripheral device 4. When a terminal is connected to the data processing network 1 and accepted by gateway 11, to correspondence table 15 a new record is added which comprises the identification code of the newly connected terminal, and the IP address associated to the current connection used by that terminal. Such record is
set apart once the connection has come to its end.

This allows an univocal identification of the terminal 4, assisting a data exchange between the terminals.

Referring now to figure 4, a procedure is described of querying data by a supervision unit 3 from an appliance 6b suitable for detecting a process variable or an event via a master peripheral device 4. The supervision unit 3 submits a query 41 to gateway 11 that is reached through the data processing network 1 and first port 12 (figure 1). Query 41 can be, for instance, a request for updating data relative to peripheral device 4 associated with a measuring instrument 6b. The query indicates also the terminal identification code 44 of the master peripheral device 4 to which the query 41 is directed; therefore, gateway 11 is enabled to retrieve dynamic IP address 40 which is currently used by master peripheral device 4 by correspondence table 15, and to forward query 41 to master peripheral device 4 by using this IP address. If no connection is present between master peripheral device 4 and gateway 11 at the moment of the query, and therefore no suitable IP can be retrieved, the forwarding of query 41 is frozen, until such connection is established, and a suitable IP address can be found and used to forward the query to master peripheral device 4.

The procedure of directly controlling an actuating device 6a via a slave peripheral device 5 by a supervision unit 3 can also be described referring to figure 4, provided references to master peripheral device 4 are replaced with references to slave peripheral device 5, and the word "query" is substituted with the word "command".

Referring now to figure 5, a procedure is described of transmitting data from a master peripheral device 4 to a supervision unit 3. Peripheral device 4 submits a request 51 to gateway 11 that is reached through data processing
network 1 and first port 12 (figure 1). The request indicates also the terminal identification code 52 of supervision unit 3 to which data 55 are directed; therefore, gateway 11 is enabled to retrieve dynamic IP address 50 which is currently used by the supervision unit 3, by means of correspondence table 15, and to forward data 55 to supervision unit 3 by using IP address 50. If no connection is present between supervision unit 3 and gateway 11 at the moment of data transmission, and therefore no suitable IP can be retrieved, the forwarding of data 55 is frozen, until such connection is established, and a suitable IP address can be retrieved and used to forward data 55 to supervision unit 3.

Still referring to figure 5, and to figure 1, a procedure is described of storing data from a master peripheral device 4 into the database 14. A request 51 is submitted to gateway 11 (figure 1) as explained when describing the data transmitting procedure; then, gateway 11 transmits the data to master 13 which possibly selects a set of relevant data from the received data and records the relevant data into database 14. Obviously, the data transmitting procedure from master peripheral device 4 to supervision unit 3, and the data storing procedure the database 14 can concern the same set of data received by gateway 11 from a master peripheral device 4.

A data transmitting procedure from a master peripheral device 4 to a supervision unit 3, and/or a data storing procedure from a master peripheral device 4 into database 14 can be activated in response to the execution of a procedure of querying data by supervision unit 3, or also by a different supervision unit which requests updated data, as above described.

A procedure of data transmitting from a master peripheral device 4 to a supervision unit 3, and/or a
procedure of data storing from a master peripheral device 4 into database 14 can be also activated according to a schedule, or following the occurrence of alarm conditions, such as exceeding a prefixed threshold value of a process variable, lack of confirmation of the execution of a command, or lack of confirmation of receipt of a command sent to a peripheral device. The schedule, and/or a set of the alarm conditions can be fixed by a user and stored into a peripheral device 4 and/or 5 by means of a data transmitting procedure, as above described.

A procedure of automatically controlling a slave peripheral device 5 by a master peripheral device 4 is described with reference to figure 6. The master peripheral device 4 is associated to an appliance 6b which is suitable for detecting a process variable or an event. When a predefined automatic controlling condition occurs, for instance, when a threshold limit is exceeded by the process variable measured by appliance 6b, peripheral device 4 submits a command 61 to gateway 11 that is reached through data processing network 1 and first port 12 (figure 1). The request indicates also terminal identification code 62 of slave peripheral device 5 to which the command 61 is directed; therefore, gateway 11 is enabled to retrieve the dynamic IP address 60 which is currently used by the slave peripheral device 5, by means of the correspondence table 15, and to forward command 61 to slave peripheral device 5 by using IP address 60.

With a method as above described, according to the invention, plants can be controlled like aqueducts, oil and gas pipelines, large industrial plants, with a very widespread multiplicity of peripheral devices, without the need of as many static IPs as the number of the required peripheral devices. Wireless peripheral devices can be used in a very cost effective way, which can be powered by
solar energy. The communication between a user and any of the peripheral devices can be made using only dynamic IP addresses.

The foregoing description of a specific embodiment will so fully reveal the invention according to the conceptual point of view, so that others, by applying current knowledge, will be able to modify and/or adapt for various applications such an embodiment without further research and without parting from the invention, and it is therefore to be understood that such adaptations and modifications will have to be considered as equivalent to the specific embodiment. The means and the materials to realise the different functions described herein could have a different nature without, for this reason, departing from the field of the invention. It is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.
1. A method for remotely controlling an appliance of a plant by a user through a data processing network, in particular a data processing network with a TCP/IP protocol, said method providing the steps of:
   - providing a supervision unit for said user;
   - associating a peripheral device to said appliance;
   - prearranging a server, said server comprising a program means, hereinafter called gateway, said gateway connected to a first port of said server, said first port having a public static IP address that is visible within said data processing network;
   - requesting an access into said data processing network by a terminal, said terminal selected from the group comprised of:
     - said supervision unit associated with said user,
     - said peripheral device associated with said appliance;
   - allocating a dynamic IP address and allowing to said terminal said access into said processing network;
   characterized in that said method provides, furthermore, the steps of:
   - requesting a connection to said gateway by said terminal through said first port;
   - accepting the connection and storing said dynamic IP address by said gateway;
   - requesting by the gateway to the terminal a terminal identification code;
   - sending said terminal identification code to said gateway by said terminal;
   - storing by the gateway both said dynamic IP address and said terminal identification code in a
correspondence table which has respective records consisting of said dynamic IP addresses on the one hand and said terminal identification codes on the other hand.

2. A method according to claim 1, wherein a data-querying procedure is provided which comprises the steps of:
- submitting a query of data by a user about a desired peripheral device, said query being submitted to the gateway by said supervision unit, said query being submitted also indicating said terminal identification code of said desired peripheral device;
- searching the current IP address of said desired peripheral device, said searching step being carried out by the gateway in said correspondence table;
- forwarding by said gateway said query to said desired peripheral device by using said IP address, and enabling said user to collect data concerning said appliance.

3. A method according to claim 1, wherein a step is provided of requesting by a peripheral device a transmission of data to a supervision unit, said requesting step being submitted to the gateway by said peripheral device, said requesting step being associated to the terminal identification code of said supervision unit.

4. A method according to claim 3, wherein steps are provided of:
- searching the current IP address of said supervision unit, said searching step being carried out by the gateway in said correspondence table;
- forwarding by said gateway said data to said supervision unit.

5. A method according to claim 1, wherein said server comprises:
- 21 -

- a program means called the master;
- a data recording area, also called database, said
database being associated with a second port of the server,
and a procedure of data processing by said master is
provided comprising the steps of:
- transferring data from said gateway to said
master, said master thus receiving transferred data;
- selecting relevant data from said transferred
data;
- recording said relevant data in said database;
said selecting and said recording steps being carried
out by said master.

6. A method according to claim 5, wherein a steps is
provided of transmitting data from said database to a
predetermined recipient supervision unit through said
second port of the server.

7. A method according to claim 3, and 4 or 5, wherein a
step is provided of fixing a schedule by a user, said
schedule comprising time limits at the expiration of
which a desired action has to be performed, said
desired action being in particular said step of
requesting a transmission of data according to claim
3, followed by a sequence of steps selected from the
group comprised of:
- said steps of searching the current IP address of
said supervision unit and forwarding said data to said
supervision unit, according to claim 4;
- said steps of selecting data and of transferring
and recording selected data according to claim 5,
said step of fixing a schedule being in particular
carried out by means of said supervision unit.

8. A method according to claim 7, wherein said schedule
comprises time limits which are programmed at prefixed
time intervals, said time intervals defining in particular a frequency of data sampling and/or of data transmission from said peripheral device.

9. A method according to claim 3, and 4 or 5, wherein a step is provided of defining an alarm condition by a user, in particular said alarm conditions being selected from the group comprised of:
- exceeding a prefixed threshold value of a process variable;
- lack of confirmation of the execution of a command previously sent to a peripheral device associated with an actuator, in particular after a predetermined number of iterations of said command;
- lack of confirmation of receipt of a command sent to a peripheral device,
wherein a desired action has to be performed at the occurrence of said alarm condition, said desired action being in particular said step of requesting a transmission of data according to claim 3, followed by a sequence of steps selected from the group comprised of:
- said steps of searching the current IP address of said supervision unit and forwarding said data to said supervision unit, according to claim 4;
- said steps of selecting data and of transferring and recording selected data according to claim 5, said step of defining alarm conditions being in particular carried out by means of said supervision unit.

10. A method according to claim 1, wherein steps are provided of:
- defining by a user an automatic controlling condition, said step carried out in particular by means of a respective supervision unit;
- automatically generating a command, i.e. a control signal, when said automatic controlling condition occur, wherein said command is sent from a master peripheral device to a slave peripheral device;

said master peripheral device associated with an instrument suitable for detecting said automatic controlling condition, in particular with a measuring device of a process variable,

said slave peripheral device associated with an actuating device of an appliance.

11. A method according to claim 10, wherein a step is provided of disabling said step of automatically-generating a command, said step of disabling carried out by a user in particular by means of a supervision unit.

12. A method according to claim 1, wherein steps are provided of:

- submitting a request of transmission of a command, i.e. a control signal, to a slave peripheral device, said request being submitted to the gateway by said supervision unit, said request being submitted indicating said terminal identification code of said slave peripheral device;

- searching the current IP address of said slave peripheral device, said searching step being carried out by the gateway in said correspondence table;

- forwarding by said gateway said command to said slave peripheral device by using said IP address.

13. A method according to claims 7 or 8 or 10, wherein said schedule and/or said alarm conditions and/or said automatic controlling conditions are stored at said peripheral device.

14. A method according to claim 1, wherein the connection of the peripheral device with the data processing
network is carried out by a means selected from the group comprised of:
- Ethernet;
- GPRS, in which case the dynamic IP address is provided by an internet access (or service) provider, i.e. a IAP;
- radio waves, in particular UHF or VHF radio waves, in which case a step is provided of converting a RF signal into Ethernet or into GPRS.

15. A method according to claim 1, wherein the connection of the supervision unit to the data processing network is carried out by a means selected from the group comprised of:
- Ethernet;
- GPRS;
- ADSL;
- PSTN,
in the latter three cases the IP address being allocated by a IAP.