AN IMPROVED APPARATUS AND METHOD FOR USER DEVICE SELECTION

FIELD OF THE INVENTION

The invention relates to an improved apparatus and method for device selection in a networked production site.

BACKGROUND OF THE INVENTION

In a networked production site, production equipment and devices are centrally managed using a distribution control system (or DCS). Each of the equipment and their devices are connected to a communication bus, to a central management server. These devices are then displayed to a user via a Human Machine Interface (or HMI), which is linked to the central management server. The HMI displays information in relation to each device and equipment the Distributed Control System is in communication with in a tree structure, in the form of folders and sub-folders. In this way, a user will be able to access and view the readings and status displays of the device without having to physically go on-location to view this information.

These devices are organized in a meaningful hierarchical structure, so that access to these devices will be made easier to a user. In one aspect, a meaningful organized structure is by organizing according to its location. In this structure, each device is organized according to firstly, a 'Site' folder, then an 'Area' sub-folder, and an 'Equipment' sub-sub-folder. Once the individual devices are accessed, parameters relevant to the access device may be viewed.

Figure 1 shows an example of a HMI display 200 of the prior art. The display shows the tree structure organization for each device, as previously described. In the HMI display 200 of the prior art, information is displayed in a first panel 210 and a second panel 220.

The first panel 210 displays the organization structure 211 of each device 212, so that a user may easily navigate and search for a device of interest.

Once a device of interest is selected, basically by highlighting the device of interest, data or information relating to the device of interest will be displayed on the right panel 220. Buttons 'XX', 'YY', 'ZZ', and 'DD' symbolize different data or information relevant to the device, and be any kind of data or information, for example, maintenance history, maintenance schedule, or any other additional related information.

When a user selects a particular device, for example Device A, and selects button 'XX', data or information relating to Device A212, pertaining to specific data or information XX, will be displayed on the left display panel 220, showing information 'Device A_XX' as a display. To view data or information 'YY' of Device A 212, a user will have to select button 'YY', when Device A 212 is still highlighted.

To view data or information 'YY' of Device B, a user will have to highlight Device B on the left panel, and click button 'YY', showing information 'Device B_YY' as a display.

The HMI 200 further includes navigation buttons 230 in the form of a 'Back' button 231 and a 'Forward' button 232. These navigation buttons 230 allow a user to move between accessed display screens.

For example, a user selects Device A and selects buttons 'XX', 'YY', 'ZZ' in order, showing information 'Device A_XX', 'Device A_YY' and 'Device A_ZZ' on display screens 221, 222 and 223 respectively, and then selects Device B, and selects button 'XX', showing information 'Device B_XX' on display screen 224.

As seen in Figure 2, the navigation buttons manage navigation by way of individual display screens. Therefore, when a user selects a back button when on display screen 224, then display screen 223 is accessed and displayed. The display screen is displayed on a display device 140, in the form of a monitor or display panel 141.

In a daily operation where a user has to access the different display panels for various devices, it may be time consuming to revisit particular devices using the navigation buttons, as these buttons only navigate between display screens. Therefore, to revisit a device that was accessed many display screens ago, a user will have to practically select the 'Back' button until the display screen is located. Otherwise, a user will have to go through the tree structure to locate and select the device of interest, and to select the data or information of interest by selecting the data or information buttons.

Further, many devices and folders of the same name can exist within the same hierarchical tree structure. Therefore, it is almost impossible or too error prone for a user to scroll up and down the tree to look for the desired device.

It is an object of the invention to ameliorate one or all of the above problems.

SUMMARY OF THE INVENTION

According to an embodiment of the invention, there is provided an improved method for user device selection in a distribution control system, including retrieving a device network address of a device selected by a user, storing said retrieved device network address in a storage device, and displaying said stored device network address to a user for selection on a display device. Advantageously, in this improved method, a user will be able to perform fast iteration between devices accessed, and may aid the user in performing comparison of information between the devices, without the need to remember the last accessed device.

Preferably, the device network addresses stored in the storage device are displayed on a panel of a display device, so that a user will be able to easily view and access this information.

Preferably, the device network addresses displayed on the display device are displayed sequentially, according to the sequence each device is selected. Therefore, the display of the device network addresses will logically follow the workflow of a user. For example,

when a user selects display screens for Device A, Device B and Device C, he will be able to logically review these 3 devices last visited using the method of the present invention. Further, a supervisor is also able to quickly review the accessed devices of a subordinate user.

Still preferably, the number of device network addresses displayed on the display device is determined by a user.

Preferably, the device network addresses are displayed in a first in, first out format, as a user is more likely to revisit the devices that he has accessed presently.

In a preferred embodiment, the method further includes the step of linking each device network address to its generic device name for display on the display device. This step would allow the generic device name that a user is accustomed to, to be displayed on a display device, as opposed to displaying the device network address, which may not be very meaningful to a user.

Preferably, the generic device name is displayed on a display list of the display device.

According to another aspect of the invention, there is provided an apparatus for user device selection in a distribution control system, including an input means to receive an input of a network address of a device, from a user, a storage means to store said input network address, a display means to display said stored network address of a device, wherein a user may access a network address of interest to access the device of interest.

Preferably, the input means is a keyboard in communication with the distribution control system.

Still preferably, the storage means is a memory or database of the distribution control system.

Preferably, the display means is a monitor or display panel.

In another embodiment, the storage means further includes a counter, to count the number of network addresses stored in the storage means.

Preferably, the counter limits the number of network addresses stored in the database.

An apparatus for user device selection in a distribution control system according to any one of claims 9 to 14, wherein each network address is linked to a generic name of each device, so that the generic name of the device is displayed on the display means.

In a preferred embodiment, the storage device is a storage of the existing distribution control system.

DESCRIPTION OF FIGURES

In order that the invention might be more fully understood, embodiments of the invention will be described by way of example only, with reference to the accompanying drawings, in which:

Figure 1 shows the Human Machine Interface panels of the prior art;

Figure 2 shows how the display screens are accessed in the prior art;

Figure 3 shows a method of the present invention; and

Figure 4 shows how the display screens are accessed using the method of the present invention.

Figure 5 shows an apparatus to provide for the method disclosed.

The attached drawings are not necessarily drawn to scale.

DETAILED DESCRIPTION OF THE INVENTION

Reference will now be made in detail to the preferred embodiments of the invention, examples of which are illustrated in the accompanying drawings. The preferred embodiments of the invention are not intended to limit the invention in its broadest aspect to these embodiments. On the contrary, the invention is intended to cover alternatives, modifications and equivalents, which may be included within the spirit and scope of the invention as defined by the appended claims. Furthermore, in the following detailed description of the embodiments, numerous specific details are set forth in order to provide an understanding of the present embodiments.

The invention relates to an improved method for user device selection in a pre-existing distribution control system.

Devices in a networked production site are organized and displayed in a hierarchical tree structure. Each device of the production site has a device network address, to identify the location of each device in the central server managing the equipment and devices of the plant.

In the present invention as seen in Figure 3, the improved method includes the steps of retrieving the device network address of a device selected by a user, storing this network address retrieved in a storage device, and displaying the stored network address to a user for selection in a display device. If there are no further devices selected, there are no further device network address to store, and the method ends. Otherwise, the method reiterates to the step of retrieving a network address of a device selected by a user, until such time there are no new network addresses to retrieve, the method ends.

According to this method, as seen in Figure 4, when a user selects, for example, Device A and subsequently Device A_XX, Device A_YY, Device A_ZZ and Device B_XX, displayed as display screen 111, 112, 113 and 121 respectively, the device network address for both Device A and Device B are retrieved and stored into a storage device or memory 130. The device network address stored in the memory 130 is displayed on a

display device 140. A user is then able to select a network address from the display device 130 to access the desired device easily.

In a preferred embodiment, a user can select the number of network addresses that are stored in the memory 130. In this embodiment, a user may use any means available in the art to determine the number of device network address that are stored, and displayed on the display device 140. For example, a user can input the number of devices desired to be stored, by choosing the 'Set' button 160.

For the convenience of a user, the pre-programmed number of network addresses stored is a typical number of devices accessed by a user in a day. This is because a user is likely to revisit the devices access within the same day as opposed to other days. In an embodiment, the devices are displayed on a display list 141 of the display device 140. Should this number be too large, the display list 141 becomes too lengthy and the method becomes a less effective tool for fast retrieval of an accessed device. As an example, the pre-programmed number of network addresses stored is 10.

In a preferred embodiment, the device network addresses are stored in a first in first out (or FIFO) format. Which is to say, should a user access Device A to Device J (i.e. 10 devices) sequentially, should the user then select Device K, then Device A will be removed from the memory 130 and will not be displayed on the display list 141.

To select a device network address of interest, a user will have to choose the device network address displayed on the display list, and then choose the 'Select' button 150.

In another embodiment, the device network address is linked to the generic name of the device, so that on the display list 141, the generic names of the devices are shown, which is more comprehensible than each individual network address.

The invention also relates to an apparatus for user device selection in a distribution control system to enable the method as previously disclosed, to be performed thereupon.

The apparatus 300, as seen in Figure 5, includes an input means 310 to receive an input of a network address of a device from a user, a storage means 320 to store the received input network address and a display means 340 to display the stored input address, for a user to select a network address of interest so as to access the device of interest.

In the embodiment of Figure 5, the input means 310 is a keyboard 311 connected to and in communication with the distribution control system, to allow a user to input a network address of a device within the control system. The network address is linked to the device such that inputting the network address will allow a user to access to the device identified by the network address. In another embodiment, the network address of the devices available in the distribution control system is available and displayed on a display means 340. A user selects a network address of a device of interest on the display means 340.

Once the network address is selected, the device linked to the network address is accessed by the user. Correspondingly, the network address so selected is stored in the storage means 320 for subsequent retrieval and selection. In the embodiment of Figure 5, the storage means 320 is in the form of a memory or database 321.

The stored network addresses previously accessed or input into the apparatus is displayed on a display means 340 in the form of a monitor or display screen 341. This allows a user to visually review and select a device of interest previously accessed, by selecting the network address linked to the said device.

Advantageously, the apparatus of the present invention allows a user to select previously accessed devices visually, without the need to commit to memory any previously accessed devices.

In another embodiment, the network address is linked to a generic name of the device, so that a user can select and access a device of interest without the need to remember the network address of the said device.

In a further embodiment, the memory or database 321 is an existing database of the distribution control system.

In another embodiment, the storage device or memory, is a storage device or memory of the distribution control system.

In yet another embodiment, the storage device or memory includes a counter, to count the number of network addresses or device names stored. This allows a user to select and limit the number of network addresses stored and displayed for subsequent retrieval and access to the device of interest.

The embodiments have been advanced by way of example only, and modifications are possible within the scope of the invention as defined by the appended claims.

CLAIMS

1. An improved method for user device selection in a distribution control system, including

retrieving a device network address of a device selected by a user;

storing said retrieved device network address in a storage device; and

displaying said stored device network address to a user for selection on a display device.

2. An improved method for user device selection in a distribution control system according to claim 1, wherein the device network addresses stored in the storage device are displayed on a panel of a display device.

3. An improved method for user device selection in a distribution control system according to any one of claims 1 or 2, wherein the device network addresses displayed on the display device are displayed sequentially, according to the sequence each device is selected.

4. An improved method for user device selection in a distribution control system according to any one of the preceding claims, wherein the number of device network addresses displayed on the display device is determined by a user.

5. An improved method for user device selection in a distribution control system according to any one of the preceding claims, wherein the device network addresses are displayed in a first in, first out format.

6. An improved method for user device selection in a distribution control system according to any one of the preceding claims, wherein the method further includes the step of linking each device network address to its generic device name for display on the display device.

7. An improved method for user device selection in a distribution control system according to claim 6, wherein the generic device name is displayed on a display list of the display device.

8. An improved method for user device selection in a distribution control system according to any one of the preceding claims, wherein the storage device is a storage of the distribution control system.

9. An apparatus for user device selection in a distribution control system, including
an input means to receive an input of a network address of a device, from a user;
a storage means to store said input network address;
a display means to display said stored network address of a device;
wherein a user may access a network address of interest to access the device of interest.

10. An apparatus for user device selection in a distribution control system according to claim 9, wherein the input means is a keyboard in communication with the distribution control system

11. An apparatus for user device selection in a distribution control system according to any one of claims 9 to 10, wherein the storage means is a memory or database of the distribution control system.

12. An apparatus for user device selection in a distribution control system according to any one of claims 9 to 11, wherein the display means is a monitor or display panel.

13. An apparatus for user device selection in a distribution control system according to any one of claims 9 to 12, wherein the storage means further includes a counter, to count the number of network addresses stored in the storage means.

14. An apparatus for user device selection in a distribution control system according to any one of claims 9 to 13, wherein the counter limits the number of network addresses stored in the database.

15. An apparatus for user device selection in a distribution control system according to any one of claims 9 to 14, wherein each network address is linked to a generic name of each device, so that the generic name of the device is displayed on the display means.