

METHOD AND APPARATUS FOR SETTING DEVICE PARAMETERS

FIELD

The present invention relates to setting the parameters of devices, and more particularly, to setting the parameters of flow control devices such as in process plants.

BACKGROUND

Prior art systems are known which are capable of retrieving and setting the operating parameter values for devices in the field such as, for example, control valves, temperature sensors, flow meters, and the like. As shown in Fig. 1, for example, the parameters of a plurality of field devices 10 are transmitted to a Field Communication Server 12, and thence to the Plant Resource Manager Client 14.

These parameters may then be saved as a Parameter Set (PS) in Database 16. However, prior art systems have had no concept or ability to compare the online device parameters with a good set of parameter values, nor to directly apply such good values to multiple devices simultaneously. Rather, the operator has had to manually configure the parameter values to each device, one at a time, often resulting in loss of production time and product and/or product quality.

The present invention solves these and other problems of the prior art by establishing a good set of parameter values of a control device in the field as an Initial Value List (IVL). By a "good" set of values is meant a set of parameter values which an experienced operator judges to be valid and preferred. The IVL may then be stored for an entire class of devices for which it was established. The stored parameters for a class of devices are hereinafter referred to as a Class Parameter Set (Class PS). The good parameter values contained in the Class PS may then be used to compare with previously saved values and/or may be applied to other online devices which are of the same classification. That is, devices having a common protocol, vendor, model and revision are referred to as having the same classification.

SUMMARY

A method and apparatus is disclosed for creating Class Parameter Sets of parameter values of field devices whereby parameter values may be compared, and Class Parameter Sets of good values may be transmitted and simultaneously applied to a plurality of online field devices.

BRIEF DESCRIPTION OF DRAWINGS

Fig. 1 is diagrammatic illustration of a prior art system;

Fig. 2 is a diagrammatic illustration of the overall system of the present invention;

Fig. 3 illustrates the forms different types of parameter Tables which are employed in the present invention; and

Fig. 4 is a flowchart illustrating the individual steps in practicing a preferred method of the present invention.

DETAILED DESCRIPTION

Referring to Fig. 2, the parameters of field devices 10 are transmitted by a field communication server, such as a Fieldbus Com (FBCom) 20, through a Parameter Manager 22 to the Plant Resource Manager Database 24 of Plant Resource Manager Client 26 in which a plurality of Parameter Sets (Saved PS) are saved as shown by numeral 28. In addition, the present invention also creates a Class Parameter Set (Class PS) 32 of good parameter values selected by the operator. The Class PS 32 is stored into Database 24, and can be seen from the Parameter Set List Window 30 which shows all the Class PS(s) of the device. The details of the Class PS can be opened in Parameter Manager 22, and the Parameter Manager also allows comparing the Class PS with all of the Saved PS(s) and with their online parameter values. Thus, the operator can compare the Class PS values, and later if he wishes, he may apply the good Class PS values to the online devices 10 via Field Communication Server 20.

When a Class PS is created from the Saved PS(s), it will be understood that it is saved against a device classification, such as protocol, vendor, model and revision, as previously described. This creation is done within the Parameter Set List window of the Plant Resource Manager Client. After the Class PS is created, if any device is selected with the same classification, the Class PS(s) will be shown in the Parameter Set List window. This is further demonstrated in Fig. 3 which illustrates the three types of prior art Tables A, B and C, and illustrates the novel Class Parameter Set Table D of the present invention. Table A illustrates a portion of a Saved PS which, for purposes of illustration, is shown as including the Field Identification (Fe_id) of a given device designated 101. Two parameters (Rect_id) such as 1000 for pressure and 1001 for temperature are shown, and illustrated as having saved parameter values of 100 and 50, respectively. Of course, in practice, many other parameters and their saved values would be included in each Saved PS.

Table B illustrates a portion of a Parameter Master Table which reflects some of the information of the Saved PS Table. In practice, as many as 20 fields would be included but are not illustrated for purposes of clarity.

Table C is known as a Device Classification Table whereby the Saved PS is stored against the classification of the device. For purposes of example, the parameters of device 101 are shown as saved against the Protocol (PRT), Vendor (VEN), Model (MOD) and Revision (REV).

In accordance with the present invention, a fourth Table D is created as a Class PS Table. This Table contains the good set of values which can be compared with any device online, and which can be applied to any device of the same classification such as Vendor (VEN), Model (MOD) and Revision (REV).

One detailed example of the operation of one preferred embodiment of the present invention will now be described with reference to Fig. 4. In step 101 the user opens the Plant Resource Manager Client, selects a field device and clicks on the Parameter Set List Window. This Saved PS is then displayed in step 102. In step 103, the user selects the Saved PS, and creates a Class PS therefrom in step 104, which is then stored in the database.

In step 105, the user selects another field device of the same class, and the Class PS is displayed in step 106. This class PS is opened in the Parameter Manager in step 107, and the Parameter Manager is launched in step 108 with the Class PS.

At this point it will be understood that there are two slightly different types of devices known as HART devices and Foundation Fieldbus (FF-H1) devices, and the present invention is fully compatible with both types. Thus, in step 109, the operator checks to determine whether it is a HART type. If so, the method automatically continues to step 110 where the Parameter Manager retrieves and shows Class PS details. If it is a FF-H1 type, then the parameters will be in "Function Blocks" which are then converted in step 109-A to display in step 110.

In step 111 the FBCom retrieves the online Device parameter values and reads the values in step 112, and transmits them to be read and compared by the operator in step 113. The operator may then compare the Class PS values with the online values, and if he finds the Class PS values to be better than the online values, he may download the Class PS values in step 114 and transmit them to the Device via the FBCom in step 115 where they are set as shown at 116. Alternatively, he may allow the Device to continue in operation with its then current online values. Thereafter, or whenever the operator chooses to terminate the operation, this is accomplished through the Parameter Manager, and the Parameter Set List window ends.

From the foregoing description it will be apparent that the present invention enables the operator to create class Parameter Sets (ClassPS(s)) which may be stored and compared to the online parameters of the Device at any time, as well as enables such good stored Class PS(s) to be set on the field Devices at any time.

It will also be apparent from the foregoing description of one embodiment of the invention that numerous variations will be obvious to those skilled in the art without departing from the spirit and scope of the invention. Accordingly, it is to be understood that the foregoing description of one preferred embodiment is intended to be illustrative of the principles of the invention rather than exhaustive thereof, and that the true invention is

not intended to be limited thereby, nor limited in scope other than as expressly set forth in the following claims.

CLAIMS

1. A method of setting parameters of a field device comprising:

- (a) selecting a set of preferred parameter values from parameter values of a given field device of a given classification;
- (b) saving the set of preferred parameter values;
- (c) creating a class parameter set of the preferred parameter values according to the classification of the device;
- (d) comparing the preferred parameter values with online operating values of the device; and
- (e) replacing the online operating values with the preferred parameter values if the preferred parameter values are better than the online operating values.

2. The method of Claim 1 wherein the classification of the device includes more than 2 of the group of the protocol, venue, model and revision of the device.

3. The method of Claim 1 including the step of determining whether the field device is of the HART type or FF-H1 type.

4. A system for setting parameters of a field device comprising:

- (a) means for saving a set of preferred parameter values from parameters of a given field device of a given classification;
- (b) means for creating a class parameter set of the preferred parameter values according to the classification of the device;
- (c) means for displaying and comparing the class parameter set of values with online operating values of the device; and
- (d) means for replacing the online operating values with the class parameter set of values if the class parameter set of values is better than the online operating values.

5. The system of Claim 4 wherein the means for displaying and comparing comprises a parameter set list window.