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[54] DEVICE AND METHOD FOR PROVIDING ACCURATE TIME AND/OR FREQUENCY

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[51] Int. Cl.[5] G04G 5/00

[52] U.S. Cl. 364/148; 368/156; 368/200; 368/202; 968/906; 968/907

[58] Field of Search 371/61; 368/47, 156, 368/200, 202; 364/900, 569, 148, 149, 150; 968/900, 906, 907, 910, 911, 913

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[57] ABSTRACT

A device and method provide for an accurate output from a unit, such as an oscillator and/or clock providing an output indicative of frequency and/or time. The device includes a processing section having a microprocessor that develops a model characterizing the performance of the device, including establishing predicted accuracy variations, and the model is then used to correct the unit output. An external reference is used to provide a reference input for updating the model, including updating of predicted variations of the unit, by comparison of the reference input with the unit output. The ability of the model to accurately predict the performance of the unit improves as additional updates are carried out, and this allows the interval between the updates to be lengthened and/or the overall accuracy of the device to be improved. The accuracy of the output is thus adaptively optimized in the presence of systematic and random variations.

24 Claims, 8 Drawing Sheets