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(54) Optical communication system for utility meters

(57) The present invention relates to an improved optical communication system for gas or electricity meters. The system comprises a transmitter and a receiver disposed on a utility meter, and a further transmitter and receiver disposed on a receiver unit. The utility meter transmitter is arranged to transmit a data signal and a further signal to the receiver unit, with the further signal having a pulse width greater than a pulse width of the data signal. The receiver unit further comprises a separation means for separating the data signal and the further signal based on pulse width. The further signal may contain calibration information or be used to link the meter to external equipment. The present invention advantageously allows for a reduction in component parts while enhancing the functionality of the meter.

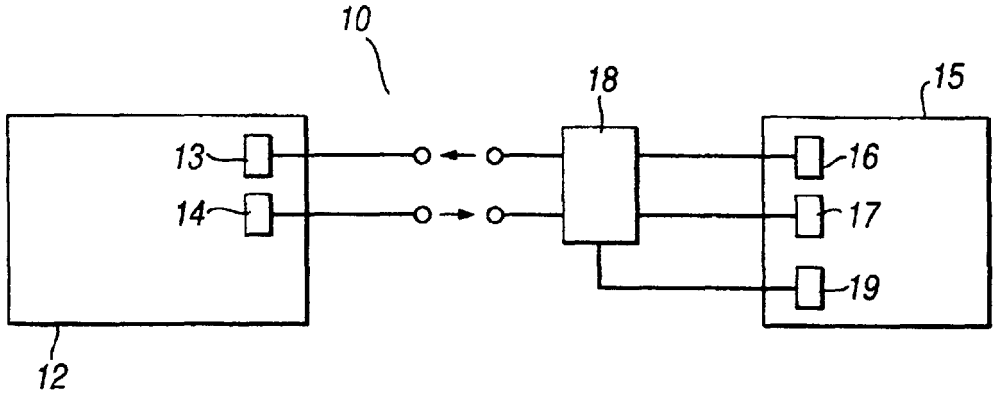

Fig.1

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Description

[0001] The present invention relates to an improved communication system for utility meters. More specifically, the present invention relates to an improved optical communication link to gas or electricity meters.

[0002] Currently, utility meters are fitted with an optical communication link means comprising a transmitter and a receiver. The transmitter is often an infrared (IR) Light Emitting Diode (LED) and the receiver is an IR detector. The optical communication link means is used for communication purposes with a receiving system. The receiving system, which may be a computer or a module in the case of a modular meter, is also fitted with an IR LED and detector.

[0003] Current optical communication link means work as follows. The utility meter's IR LED transmits IR signals containing data information to the receiving system's IR detector. The receiving system responds by transmitting IR signals from the receiving system's IR LED to the utility meter's IR detector.

[0004] However, some utility meters require in addition to an optical communication link, a pulse output. The pulse output is used for calibration and testing purposes or for linking the meter to external equipment. To date the optical communication link means and pulse output means have been separate devices.

[0005] Thus, a technical improvement to existing utility meters by combining the optical communications link means and pulse output means into a single device is addressed by the present invention.

[0006] The present invention advantageously allows for a reduction in component parts while enhancing the functionality of current utility meters.

[0007] According to the present invention there is provided a communication system for use with utility meters, the system comprising a transmitter and a receiver disposed on a utility meter, and a further transmitter and receiver disposed on a receiver unit, said utility meter transmitter being arranged to transmit a data signal and a further signal to said receiver unit, said further signal having a pulse width greater than a pulse width of said data signal, and said receiver unit further comprising a separation means for separating said data signal and said further signal based on pulse width.

[0008] According to an aspect of the present invention, the data signal and the further signal are optical signals. The optical signals may be infrared signals. The optical signals may be visible signals. The separation means may be a discrete component timing system. Alternatively, the separation means may be a microprocessor. The utility meter may be a gas meter. Alternatively, the utility meter may be an electricity meter.

[0009] According to a further aspect of the present invention said further signal contains calibration information.

[0010] According to the present invention there is provided a method of communicating between a utility meter unit and a receiving unit comprising the steps of:

transmitting a data signal and a further signal, said further signal having a pulse width greater than a pulse width of said data signal,
receiving said data signal and said further signal, and
separating said data signal and said further signal based on pulse width.

[0011] While the principal advantages and features of the invention have been described above, a greater understanding and appreciation of the invention may be obtained by referring to the drawings and detailed description of the preferred embodiment, presented by way of example only in which;

FIGURE 1 shows a communications system for utility meters according to the present invention, and
FIGURE 2 shows a circuit diagram of a typical pulse and data separation circuit.

[0012] Figure 1 shows a communications system 10 for utility meters according to the present invention. A receiver 13 and a transmitter 14 are disposed on a utility meter 12. Similarly, a transmitter 16 and a receiver 17 disposed on a receiver unit 15. The transmitters and receivers are configured such that communication between the utility meter and the receiver unit is possible. The utility meter transmitter 14 is further configured to transmit data signals with a predefined pulse width. These data signals are received by the receiving unit's receiver 17. The utility meter transmitter 14 is further configured to transmit a further signal with a pulse width greater than the predefined pulse width of the data signal. The receiving unit further comprises a separation means 18 arranged to separate the data signal from the further signal based on the pulse width of the two signals. If the pulse width of the received signal is greater than that a predefined value, than the signal is recognised as being a signal containing calibration data. If the pulse width is approximately equal to the predefined value, than the signal is recognised as being a signal containing user data.

[0013] As will be appreciated by those skilled in the art, the signal with a pulse width greater than the predefined value may be a signal containing information other than calibration data. For example, the signal may be used to link the meter to external equipment. Similarly, the signal having a pulse width approximately equal to the predefined value may contain information other than user data.

[0014] Preferably, the signals are optical signal and are generated by an LED. However, as will be appreciated, other electromagnetic signals, such as microwaves, could be used without departing from the scope of the present invention.

[0015] Figure 2 shows a typical pulse width separation

circuit 18 suitable for use in the present invention. The operation of the circuit is well known in the art. A signal containing both data and calibration information is transmitted from the utility meter transmitter and received at input 20. The circuit functions to separate the signal based on pulse width, with the component of the signal having a pulse width approximately equal to a predefined value being fed to data output 21 and the component of the signal with a pulse width greater than the predefined value being fed to calibration output 22.

[0016] As will be appreciated by those skilled the art, the pulse width separation circuit 18 may be replaced with a microprocessor.

[0017] In a first embodiment of the present invention, the utility meter is a gas meter and the optical signal is an Infrared signal.

[0018] In a second embodiment of the present invention, the utility meter is an electricity meter and the optical signal is a visible signal. In this embodiment the visible signal is a wavelength corresponding to the colour red and is generated by a red LED.

[0019] In a further embodiment of the present invention, the utility meter is a water meter.

[0020] As will be appreciated by those skilled in the art, various modifications may be made to the embodiment hereinbefore described without departing from scope of the present invention.

Claims

1. A communication system for use with utility meters, the system comprising a transmitter and a receiver disposed on a utility meter, and a further transmitter and receiver disposed on a receiver unit, said utility meter transmitter arranged to transmit a data signal and a further signal to said receiver unit, said further signal having a pulse width greater than a pulse width of said data signal, and said receiver unit further comprising a separation means for separating said data signal and said further signal based on pulse width.

2. A communication system as claimed in Claim 1, wherein said data signal and said further signal are optical signals.

3. A communication system as claimed in Claim 2, wherein said optical signals are infrared signals.

4. A communication system as claimed in Claim 2, wherein said optical signals are visible signals.

5. A communication system as claimed in Claim 4, wherein said visible signals are a wavelength corresponding to the colour red.

6. A communication system as claimed in any of Claims 2-5, wherein said optical signals are generated by an LED.

7. A communication system as claimed in any preceding Claim, wherein said separation means is a discrete component timing system.

8. A communication system as claimed in any of Claims 1-6, wherein said separation means is a microprocessor.

9. A communication system as claimed in any preceding Claim, wherein said utility meter is a gas meter.

10. A communication system as claimed in any of Claims 1-8, wherein said utility meter is an electricity meter.

11. A communication system as claimed in any of Claims 1-8, wherein said utility meter is a water meter.

12. A communication system as claimed in any preceding Claim, wherein said further signal contains calibration information.

13. A method of communicating between a utility meter unit and a receiving unit comprising the steps of:

    transmitting a data signal and a further signal, said further signal having a pulse width greater than a pulse width of said data signal,
    receiving said data signal and said further signal, and
    separating said data signal and said further signal based on pulse width.

14. A communication system as hereinbefore described with reference to the accompanying figures.

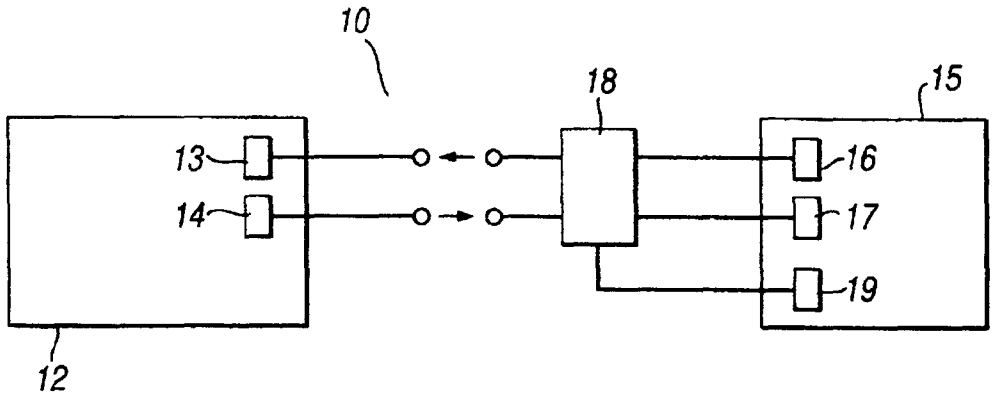

Fig.1

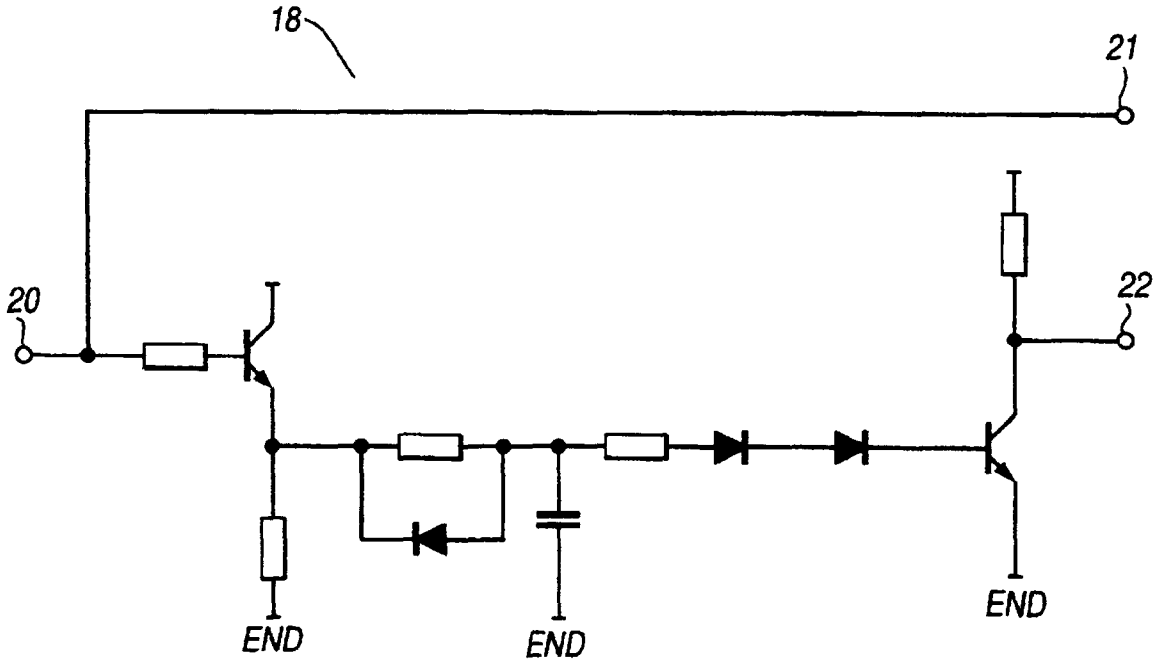

Fig.2