light intensities registered by the light detectors may be processed in the unit **110** in a straightforward manner.

[0033] Preferably, the arrangement also includes a selection means **120** adapted to, on one hand, control the arrays of light sources **131** and **132** to emit light from a given light source during a specified interval; and on the other hand, control the arrays of light detectors **141** and **142** to register light energy in one or more detectors during corresponding specified intervals. The selection means **120** is either a separate unit (as illustrated in FIG. **1**), or an integral module of the processing unit **110**. In any case, based on a request signal P_{req} originated in the processing unit **110**, the selection means **120** is configured to generate a specific control signal R_X, R_Y, PC_X or PC_Y to the arrays of light sources **131** or **132**, or the arrays of light detectors **141** or **142** respectively. Here, each control signal in a first set of control signals R_X and R_Y is adapted to cause light to be emitted from a particular light source in a given array of light sources **131** or **132**, whereas each control signal in a second set of control signals PC_x and PC_y is adapted to cause registration of light received by a particular light detector in a given array of light detectors **141** or **142**.

[0034] It is further preferable if the processing unit **110** includes, or is associated with, a computer readable medium **111**, e.g. a memory module, which stores a program, where the program is adapted to make the processing unit **110** control the proposed arrangement as described above.

[0035] FIG. **2** shows a schematic circuit diagram over a light source and a light detector respectively according to one embodiment of the invention. The right hand circuitry represents one of the light sources in one of said arrays, say **132**, whereas the left hand circuitry represents one of the light detectors in one of said arrays, say **142**.

[0036] In the embodiment illustrated in FIG. **2**, a first switch S**1** is configured to pre-charge a photo diode D_{ph} in response to a first control signal PC, e.g. embodied by the above signal PC_Y from the selection means **120**. Hence, the first control signal PC is adapted to cause the photo diode D_{ph} to register an ambient light intensity. A set of resistors r**1**, r**2** and r**3** are arranged to accomplish appropriate bias voltages for a second switch S**2** and the photo diode D_{ph} respectively. The second switch S**2** is configured to set the photo diode D_{ph} in an active state or an idle state in response to a second control signal SET_{idle}, e.g. generated by the processing unit **110** and forwarded via the selection means **120**. Preferably, both the first and second switches S1 and S2 are connected to a supply voltage V_{sup}, say 3V.

[0037] A third switch S**3**, is configured to control a fourth switch S**4** in response to a third control signal R, e.g. embodied by the above signal R_Y from the selection means **120**. The fourth switch S**4**, in turn, is configured to activate a light emitting diode D_{em}, such that light energy Λ_{em} is produced. A charge capacitor C_s and a charging resistor r**4** are connected to the light emitting diode D_{em} and arranged to supply the required energy to the light emitting diode D_{em}. The charging resistor r**4** is further connected to the supply voltage V_{sup}, say 3V.

[0038] FIG. **3***a* shows a diagram illustrating one example of a voltage V_C (in a point C downstream of the light emitting diode D_{em} in FIG. **2**) as a function of time t, FIG. **3***b* shows a diagram illustrating one example of a voltage V_D (in a point D upstream of the light emitting diode D_{em} in FIG. **2**) as a function of time t, FIG. **3***c* shows a diagram illustrating one example of a voltage V_A (in a point A upstream of the photo diode D_{ph} in FIG. **2**) as a function of time t, and FIG. **3***d* shows a diagram illustrating one example of a voltage V_B (in a point R downstream of the photo diode D_{ph} in FIG. **2**) as a function of time t.

[0039] In this example, we presume that the predefined sequence of light pulses implemented by the processing unit **110** prescribes that a light pulse is to be generated by the light source (i.e. the light emitting diode D_{em}) during a specified interval T**0**, and that this light source shall produce a subsequent light pulse a time T**1** later. The third control signal R causes a voltage dip in V_C during the interval T**0**. As a result, the charge capacitor C_s releases its stored energy through the light emitting diode D_{em}, and the diode emits light over the display device towards the photo diode D_{ph}.

[0040] As can be seen in FIG. **3***b*, during the interval T**0**, V_D drops from a maximum value V_o due to the drain of electric charges from the capacitor C_s. Thereafter, the capacitor C_s is recharged until the time T**1** has expired, and the procedure is repeated.

[0041] We now refer to FIGS. **3***c* and **3***d*. As mentioned above, an initial measurement value V_1 representing the ambience light intensity is registered by the light detector (i.e. the photo diode D_{ph}) prior to emitting the light pulse from the light emitting diode D_{em}). Thus, to this aim, the processing unit **110** controls the photo diode D_{ph} in coordination with the light emitted from the light emitting diode D_{em}. Preferably, the processing unit **110** is configured to cause pre-charging of the photo diode D_{ph} by forwarding the first control signal PC to the first switch S**1**. The processing unit **110** initiates this pre-charging at least a threshold time T**3** prior to the start of the specified interval T**0**, and continues the pre-charging during an interval T**2**.

[0042] Moreover, it is preferred that the processing unit **110** is configured to initiate the emission of light from the light emitting diode D_{em} no earlier than after that the processing unit **110** has been allowed sufficient time to receive digital data D_{FB} (e.g. via the above-mentioned digitizing unit **150**) representing the initial measurement valve V_1. In practice, this normally means that a period T**4** after the threshold time T**3** must also expire before the specified interval T**0** can be initiated.

[0043] Additionally, according to one preferred embodiment of the invention, the processing unit **110** is configured to control the light detectors in coordination with the light pulses, such that the precharging interval T**2** is terminated no earlier than a delay time TD after expiry of the specified interval T**0** during which light is emitted from the given light emitting diode D_{em}. Consequently, the first and third control signals PC and R respectively have such timing interrelationship that the pre-charging interval T**2** continues at least a period TD after ending the specified interval T**0**. Then, at the end of the delay time TD, the voltage V_A is caused to drop down to a relatively low idle voltage in response to the first control signal PC. Here, the delay time TD represents a conversion time of the digitizing unit **150** for producing the digital data D_{FB} based on the received measurement value, i.e. a secondary measurement value V_2 registered by the photo diode D_{ph} during emission of light Λ_{em} from the light source D_{em}.

[0044] In order to make sure that the secondary measurement value V_2 is registered while the light Λ_{em} from the light emitting diode D_{em} still is being emitted, the processing unit **110** is preferably configured to record digital data D_{FB} representing this value a time T**5** after the initiating the specified