Claims

1. An analog input device comprising:

at least one mounting panel;

a matrix of analog push button assemblies mounted to the at least one mounting panel, each analog push button assembly comprising an analog pressure sensor, wherein the analog pressure sensor comprises:

a pressure reception arrangement having an optical sensing sub-arrangement configured to measure an amount of light varied according to a pressure sensed at the pressure reception arrangement and an output terminal for outputting an analog signal corresponding to the amount of light measured, and

a plunger element configured to exert the pressure on the pressure reception arrangement when the analog push button assembly is pressed by a user's finger;

a multiplexer including an input side and an output side, wherein the input side is coupled to the output terminals of the matrix of analog push button assemblies;

an analog-to-digital converter which is coupled to the output side of the multiplexer, wherein the analog-to-digital converter converts the analog signal into a digital-step-value;

a processor which is coupled to the analog-to-digital converter and which is configured to output a data packet including a button identity (ID) of the push button assembly pressed by the user's finger and the digital-step-value converted from the analog signal of the push button assembly by the analog-to-digital converter; and

a communication interface configured to transmit the data packet to a host computing device.

2. The input device as claimed in claim 1, further comprising an analog filter coupled in an electrical connection between the pressure sensor and the analog-to-digital converter.

3. The input device as claimed in claim 1, further comprising a lighting arrangement including at least one light source controlled by the processor.

4. The input device as claimed in claim 1, wherein the analog signal is an analog voltage.

5. The input device as claimed in claim 1, wherein the pressure reception arrangement comprises a biasing element which is arranged between the plunger element and the at least one mounting panel and which biases the plunger element away from the at least one mounting panel in a biasing direction.

6. The input device as claimed in claim 5, wherein the optical sensing sub-arrangement comprises:

a light emitter which is disposed at an intermediate level between the plunger element and the at least one mounting panel and which is oriented to emit light along a light path perpendicular to a biasing direction of the biasing element;

a light sensor which is disposed in the light path and which is configured to generate the analog signal based on the amount of light sensed by the light sensor for outputting via the output terminal; and

a light blocking element which is associated with the plunger element in a manner so as to be movable together with the plunger element along a movement direction parallel to the biasing direction and which is extending towards the mounting panel to intersect the light path between the light emitter and the light sensor, wherein the light blocking element comprises a cut-out profile which varies the amount of light passing through the light blocking element as the light blocking element moves transversely across the light path when the plunger element is moved towards the at least one mounting panel.

7. A computing system for receiving and processing analog input, the computing system comprising:

a host processor; and

the input device according to any one of claims 1 to 6 connected to the host processor via the communication interface,

wherein the host processor is configured to receive the data packet from the input device, to determine an amount of depression of a respective push button assembly based on the digital-step-value of the data packet, and to generate a corresponding predetermined application event in an application based on the determined amount of depression of the respective push button assembly and an input setting for the application.

8. The computing system as claimed in claim 7, wherein the host processor is further configured to transform the determined amount of depression onto a non-linear scale prior to generating the corresponding predetermined application event.

9. The computing system as claimed in claim 7, wherein the corresponding predetermined application event comprises a continuous variable action, and wherein the host processor is configured to generate a state of the continuous variable action according to the determined amount of depression.

10. The computing system as claimed in claim 7, wherein the corresponding predetermined application event comprises a discrete action, and wherein the host processor is configured to generate the discrete action when the determined amount of depression is equal to or greater than a pre-set depression level.

11. The computing system as claimed in claim 7, wherein the corresponding predetermined application event comprises a first discrete action and a second discrete action, and wherein the host processor is configured to generate the first discrete action when the determined amount of depression is equal to a first pre-set depression level or between the first pre-set depression level and a second pre-set depression level, and to

generate the second discrete action when the determined amount of depression is equal to or greater than the second pre-set depression level.

12. The computing system as claimed in claim 7, wherein the host processor is configured to toggle between a first input setting and a second input setting for the application based on a user input command via a physical modifier key or a virtual modifier key, and wherein a first corresponding predetermined application event associated with the first input setting is different from a second corresponding predetermined application event associated with the second input setting.

13. A method of processing analog input for a computing system according to claim 7, the method comprising:

generating, via the pressure reception arrangement, the analog signal corresponding to the amount of light measured as a measure of the pressure exerted on the pressure reception arrangement when the push button assembly is pressed by a user's finger;

digitizing, via the analog-to-digital converter, the analog signal into the digital-step-value;

outputting, via the processor, the data packet including the button identity (ID) of the push button assembly pressed by the user's finger and the digital-step-value converted from the analog signal of the push button assembly by the analog-to-digital converter;

transmitting, via the communication interface, the data packet from the processor of the input device to the host processor of the computing system;

determining, via the host processor, the amount of depression of the respective push button assembly based on the digital-step-value from the data packet received; and

generating, via the host processor, the corresponding predetermined application event in the application based on the determined amount of depression of the respective push button assembly and the input setting for the application.

14. The method as claimed in claim 13, further comprising transforming the determined amount of depression onto a non-linear scale prior to generating the corresponding predetermined application event.

15. The method as claimed in claim 13, wherein the corresponding predetermined application event comprises a continuous variable action, and wherein generating the corresponding predetermined event comprises generating a state of the continuous variable action according to the determined amount of depression.

16. The method as claimed in claim 13, wherein the corresponding predetermined application event comprises a discrete action, and wherein generating the corresponding predetermined event comprises generating the discrete action when the determined amount of depression is equal to or greater than a pre-set depression level.

17. The method as claimed in claim 13, wherein the corresponding predetermined application event comprises a first discrete action and a second discrete action, and wherein generating the corresponding predetermined event comprises generating the first discrete action when the determined amount of depression is equal to a first pre-set depression level or between the first pre-set depression level and a second pre-set level, and to generate the second discrete action when the determined amount of depression is equal to or greater than the second pre-set depression level.

18. The method as claimed in claim 13, further comprising toggling between a first input setting and a second input setting for the application based on a user input command via a physical modifier key or a virtual modifier key, and wherein a first corresponding predetermined application event associated with the first input setting is different from a second corresponding predetermined application event associated with the second input setting.