Claims

~~1. A method for using a shot peening valve controller for shot peening, the method comprising:~~

- ~~providing a shot peening valve controller;~~
- ~~assigning a first electronic identification to a first shot peening valve;~~
- ~~assigning a second electronic identification to a second shot peening valve;~~
- ~~connecting the first shot peening valve to the shot peening valve controller according to the first electronic identification;~~
- ~~connecting the second shot peening valve to the shot peening controller according to the second electronic identification; and~~
- ~~offering an input output unit that comprises multiple electronic addresses for connecting the first shot peening valve and the second shot peening valve.~~

~~2. The method of claim 1 further comprising:~~
~~communicating with the first shot peening valve according to the first electronic identification; or~~
~~communicating with the second shot peening valve according to the second electronic identification.~~

~~3. The method of claim 2, wherein~~
~~the communicating with the first shot peening valve or the second shot peening valve comprises transmitting signals with the first shot peening valve or the second shot peening valve.~~

~~4. The method of any of the preceding claims further comprising~~
~~changing the first electronic identification of the first shoot peening valve to the second electronic identification for communicating with the first shot peening valve according to the second electronic identification.~~

5. The method of any of the preceding claims further comprising configuring any of the shot peening valves according to shot peening process requirement.

6.1. A shot peening valve controller comprising:

a central processing unit configured to carry out instructions of a computer programmeprogram;

a memory connected to the central processing unit for storing information of the computer programmeprogram;

an input output unit further connected to the central processing unit for connecting that is connected to an external electronic device; and

an internal bus additionally connected to the central processing unit, the memory, the input output unit or a combination of any of these components; and multiple channelswherein the input output unit comprises a user interface for connecting to multipledisplaying performance data of the shot peening valves according to their respective electronic identificationsvalve controller;

wherein the input output unit further comprises multiple electronic addresses for connecting to multiple shot peening valves respectively.;

7. Thewherein the shot peening valve controller of claim 6, wherein the input output unit comprises a user interface for displaying performance data is configured to power each of the multiple shot peening valve controllervalves according to their electronic addresses respectively.

8.2. The shot peening valve controller of claim 71, wherein

the user interface comprises a flat panel display for showing text and graph.

9.3. The shot peening valve controller of any of the preceding claims 6 to 8claim 1 further comprising

a local power supply that is connected to the central processing unit.

10.4. The shot peening valve controller of any of the preceding claims 6 to 9claim 1 further comprising

a reset switch for clearing pending errors or events of the shot peening valve controller.

~~11.~~5. The shot peening valve controller of ~~any of the preceding claims 6 to 10~~claim 1 further comprising

a protector for shielding components of the shot peening valve controller.

~~12.~~6. The shot peening valve controller of claim ~~11~~5, wherein

the protector comprises a sheltered heat dissipater for discharging hot air but inaccessible to falling dust or liquid spillage.

~~13.~~7. The shot peening valve controller of ~~any of the preceding claims 6 to 12~~claim 1, wherein

the shot peening valve controller is configured to process signals from multiple shot peening valves simultaneously.

~~14.~~8. The shot peening valve controller of ~~any of the preceding claims 6 to 13~~claim 1, wherein

the shot peening valve controller is configured to power multiple shot peening valves concurrently.

~~15.~~9. The shot peening valve controller of ~~any of the preceding claims 6 to 14~~claim 1, wherein

the input output unit comprises terminals connecting multiple shot peening valves respectively.

~~16.~~10. The shot peening valve controller of ~~any of the preceding claims 6 to 15~~claim 1, wherein

the input output unit comprises a detachable connector for connecting to at least one shot peening valve.

11. The shot peening valve controller of claim 1, wherein the input output unit further includes a communication interface, a digital input interface, a digital output interface, an analogue input output interface, a pulse counter and timer.

12. The shot peening valve controller of claim 1, wherein the multiple shot peening valves are connected via a round male DIN connector located at a rear of the shot peening valve controller, which is then connected to a 485-module located inside the shot peening valve controller and then to a microcontroller on a printed circuit board.

13. The shot peening valve controller of claim 12, wherein the microcontroller comprises a core processor attached with a heatsink, a CPU cooling fan, a timer, a plurality of memory, a plurality of serial communications peripheral, an Analogue-to-Digital converter (ADC), a Pulse Width Modulator (PWM) and a General-Purpose Input/Output (GPIO).

14. The shot peening valve controller of claim 13, wherein a Pulse Width Modulator (PWM) is mounted on the printed circuit board and is connected to an analogue output module mounted on the printed circuit board; wherein the PWM is adapted to generate a timed Analogue Voltage feedback based on the equivalent ADC from the signals received in Analogue Input module.

15. The shot peening valve controller of claim 13, wherein the plurality of serial communications peripheral comprises a Controller Area Network (CAN) and a plurality of Universal Asynchronous Receiver/Transmitter (UART).

16. The shot peening valve controller of claim 13, further configured to automatically or manually adjust the gain to one or more of its channels, ports or electric connections so that relevant shot peening processes at respective shot peening valves are adjusted to their preferred or best performance.

17. The shot peening valve controller of claim 13, wherein the user interface displays four valve status panel that indicate the status of four valves; wherein the status includes the flowrate specifically a set flowrate, an actual flowrate, an operational status of the valve and an alarm status; wherein an alarm setup includes an alarm band in percentage, an alarm delay in seconds and a startup delay in seconds, and the alarm band provides an upper and a lower limit of the flow rate to trigger the alarm.

18. The shot peening valve controller of claim 13, further comprises a program mode that enables to remotely select a stored recipe using product select bits; wherein a

corresponding recipe is chosen by sending signal from the PLC to the Digital Input, which then goes through the GPIO1; wherein the program selection is received from the digital inputs, the load feed data is retrieved from the internal memory and then feeding the data into the multiple shot peening valves.

19. The shot peening valve controller of claim 1, wherein the shot peening valve controller allows the end user to select or store up to 4 different calibrated media types in each valve, thereby allowing the user to instantly change the abrasive without the need for the valve to be sent out for calibration as compared to a traditional one media calibrated valve.

~~17.~~20. A shot peening valve assembly comprising:

- the shot peening valve controller according to ~~any of the preceding claims 6 to 16~~claim 1; and
- a first shot peening valve connected to ~~the~~ terminals of the shot peening valve controller.

~~18.~~21. The shot peening valve assembly of claim ~~17~~ 20 further comprising

a second shot peening valve connected to the terminals of the shot peening valve controller.

~~19.~~22. The shot peening valve assembly of claim ~~17 or 18~~20 further comprising

an electrical cable that is connected to the first shot peening valve, ~~the~~ second shot peening valve and ~~some~~ at least one of the terminals of the shot peening valve controller.

~~20.~~23. The shot peening valve assembly of claim ~~19~~22, wherein

at least one wire of the electrical cable is shared by the first shot peening valve and the second shot peening valve.

~~21.~~24. The shot peening valve assembly of claim ~~19 or 20~~22, wherein

the electrical cable comprises a protective layer.

~~22.~~25. A shot peening equipment comprising:

- the shot peening valve assembly according to ~~any of the preceding claims 16 to 21~~claim 20; and
- a first blast hose that is installed with the first shot peening valve; ~~and~~
- ~~a second blast hose that is installed with the second shot peening valve;~~

wherein both the first shot peening valve and the second shot peening valve are connected to the shot peening valve controller for operating the first shot peening valve and the second shot peening valve independently.

~~23.~~26. The shot peening equipment of claim ~~22~~ 25 further comprising

a computer that is connected to ~~the~~ shot peening control valve.

~~24.~~27. The shot peening equipment of claim ~~22 or 23~~25 further comprising

a power supply unit for powering the shot peening valve controller, the shot peening valve assembly, the shot peening equipment or a combination of any of these.