CLAIMS:

1. An industrial automation controller, comprising:

a central processing unit;

an input/output module, wherein the central processing unit is configured to communicate via ~~an~~ the input/output module with automation devices of an industrial process controlled by the automation controller;

a retention feature configured to toollessly couple with a detachable display and memory module; and

a controller connector configured to communicatively couple with a display connector of the detachable display and memory module such that the automation controller and the detachable display and memory module are communicatively coupled, wherein the central processing unit is configured to transmit data for presentation on a display of the detachable display and memory module and configured to receive data from a memory and/or a data entry feature of the detachable display and memory module when the detachable display and memory module is communicatively coupled to the automation controller.

~~2. The automation controller of claim 1, comprising the input/output module.~~

~~3~~2. The automation controller of claim ~~2~~1, wherein the input/output module comprises an input/output board that is integral with the central processing unit.

~~4~~3. The automation controller of claim 1, wherein the retention feature comprises a receptacle configured to receive coupling features of the detachable display and memory module.

~~5~~4. The automation controller of claim 1, wherein the retention feature comprises a protrusion configured to couple with a receptacle of the detachable display and memory module.

~~6~~5. The automation controller of claim 1, wherein the retention feature comprises a receptacle with angled protrusions extending from each of at least two walls of the receptacle.

~~7~~6. The automation controller of claim ~~6~~5, wherein each of the angled protrusions is configured to slidably engage with a respective flexible coupling feature of the detachable display and memory module such that the flexible coupling features flex to pass over the respective angled protrusions and then flex back to engage an edge of each angled protrusion to resist movement of the detachable display and memory module away from engagement with the automation controller.

~~8~~7. The automation controller of claim 1, wherein the controller connector comprises a female pin connector or a male pin connector.

~~9~~8. The automation controller of claim 1, wherein the controller connector comprises various connection components.

~~10~~9. The automation controller of claim 1, wherein the controller connector comprises a first connection component configured to transmit data between a display and the automation controller, a second connection component configured to transmit data between a data entry feature and the automation controller, and a third connection component configured to transmit data between an external memory and the automation controller.

~~11~~10. An industrial automation controller system, comprising:

a detachable display and memory module, comprising:

a module housing;

a display disposed within the module housing;

a memory disposed within the module housing;

a first connector; and

coupling features; and

an industrial automation controller, comprising:~~.~~

a central processing unit;

an input/output module, wherein the central processing unit is configured to communicate via ~~an~~ the input/output module with automation devices of an industrial process controlled by the automation controller;

a retention feature configured to toollessly couple with the coupling features of the detachable display and memory module; and

a second connector configured to communicatively couple with the first connector of the detachable display and memory module such that the automation controller and the detachable display and memory module are communicatively coupled, wherein the central processing unit is configured to transmit data for presentation on the display of the detachable display and memory module and configured to receive data from the memory of the detachable display and memory module when the detachable display and memory module is communicatively coupled to the automation controller.

~~12~~11. The system of claim ~~11~~10, wherein the detachable display and memory module comprises a data entry feature.

~~13~~12. The system of claim ~~12~~11, wherein the data entry feature comprises a touch screen component of the display or a data entry pad.

~~14~~13. The system of claim ~~11~~10, wherein the memory module is configured to receive data from an external computer.

~~15~~14. The system of claim ~~11~~10, wherein the retention feature comprises a receptacle or a protrusion.

~~16~~15. A detachable display and memory module, comprising:

a module housing;

a display disposed within the module housing;

a memory disposed within the module housing;

a display connector configured to communicatively couple with a controller connector of an industrial automation controller upon attachment of the detachable display and memory module with the automation controller; and

coupling features configured to toollessly couple with aspects of a retention feature of the automation controller.

~~17~~16. The detachable display and memory module of claim ~~16~~15, comprising a data entry feature.

~~18~~17. The detachable display and memory module of claim ~~17~~16, wherein the data entry feature comprises a touch screen.

~~19~~18. The detachable display and memory module of claim ~~16~~15, wherein the memory is configured to communicate with the automation controller via a dedicated component of the display connector.

~~20~~19. The detachable display and memory module of claim ~~16~~15, wherein the coupling features comprise elongate flexible extensions from the housing configured to bend upon engagement with the aspects of the retention feature and flex back to abut edges of the aspects of the retention feature to hold the detachable display in place relative to the automation controller.