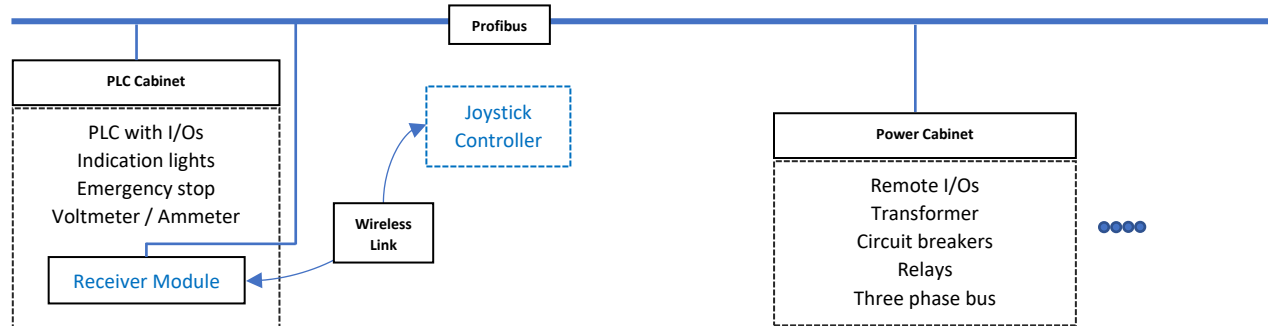


Required Solution:



Functionalities of Actuators in AJR Wireless Controller:



Figure 1: Proposed AJR Controller. The actuators are numbered to provide their descriptions.

Sr #	Actuators with Details	Functional Description
1	3-Position Rotary Switch Quantity: 3	Operation Mode: Maintenance Operation Mode: Manual Operation Mode: Semi-Auto
		Mechanism Selection: Bridge Mechanism Selection: Hoist Mechanism Selection: Trolley
		Trolley Position Selection: L1 Trolley Position Selection: L2 Crane Position Selection: Service Area
2	4-Position Rotary Switch Quantity: 1	Bridge Position Selection: S1 Bridge Position Selection: S2 Bridge Position Selection: S3 Bridge Position Selection: S4
3	2-Position Toggle Switch Quantity: 3	Bypass Operation: Activate Bypass Operation: De-activate
		Site Power: ON Site Power: OFF
4	Push Button Quantity: 3+1 (1 button at the side for controller ON/OFF operation)	Acknowledge Fault
		Auto Operation: Start
		Auto Operation: Stop
		Transmitter Power ON / OFF
5	Mushroom Head Push Button with Latching Quantity: 1	Emergency Stop Operation
6	2-Axis Proportional Joystick with a NC contact for resting position Quantity: 1	Horizontal Axis: Bi-directional Bridge Movement
		Vertical Axis: Bi-directional Trolley Movement
		Resting Position: Stop Bridge/Trolley Movement

7	1-Axis Proportional Joystick with an NC contact for resting position Quantity: 1	Vertical Axis: Bi-direction Hoist Movement
		Resting Position: Stop Hoist Movement
8	External Buzzer with Indication Quantity: 1	For indication of transmitter faults + warnings

Description of ACRM15 Wireless Receiver:

We aim to use ACRM15 receiving unit with programmable relay board and Profibus DP board in its 2-expansion slots. The receiver would be installed inside the PLC cabinet and would provide access to the full range of actuations offered by the transmitter as well as any system diagnostics.

- Programmable relay board will provide status of all the digital signals in the transmitter like emergency stop button, selector switches, push buttons and buzzer. These relay contacts will be directly fed to PLC digital input modules with proper (24 V DC) power supply.
- Profibus DP board of the receiver will be plugged into the Profibus architecture of the system to be directly available to the PLC. In addition to the system diagnostics and above-mentioned digital signals, it will provide access to the analog signals of the proportional joysticks in the form of 12-16 bit data (per joystick).

Documentation Requirements:

To successfully integrate the wireless control, we need following information to analyze the programming, installing, and commissioning of this solution:

- 1) Connection diagram for ACRM15 receiving unit with the information about all the pins of 24/32 pin connector to be used for its installation.
- 2) An instructions manual to access and configure the features of ACRM15 like programmable relays and data feedback inputs as well as establishing wireless communication to AJR transmitter.
- 3) Guidelines and information about following boards and their usage in the expansion slots of ACRM15 for:
 - a. Programmable relay board for hardwiring the commands into the system operation.
 - b. Profibus DP communication board for connection with the PLC system.