# Centralus™ Irrigation Management Software Written Specifications

**Part 1 – General**

1. The Centralus Irrigation Management Platform from Hunter Industries shall consist of cloud-based control software capable of remote monitoring and management of compatible Hunter residential and commercial irrigation controllers via Wi-Fi, Ethernet (LAN), or 4G LTE cellular connections.
2. The central control software shall be accessible via internet browser and shall display the activity of all managed controllers in list and/or map overviews.
3. All controllers shall be visible on a live, online map and located automatically based on the user-supplied controller addresses.
	* + 1. The map shall be selectable between satellite or terrain views.
			2. The map shall automatically size to the extents of the controller locations to show all controllers, and users shall have the ability to zoom, pan, and navigate freely throughout the map for controller selection purposes.
4. The central control software shall permit selection of any controller and offer full remote programming of all controller features, including irrigation scheduling, controller settings, and weather-based watering adjustments, in the browser.
5. The central control software shall allow the user full remote-control capabilities, including starting and stopping individual stations and programs or setting the controller to Off for a user-defined number of days. The system shall also allow quick adjustment of irrigation amounts by a percentage value.
6. The central control software shall be compatible with locally installed smart weather adjustment sensors, which can adjust each controller’s irrigation schedule automatically based on local climate conditions. The software shall also report controller shutdowns due to active rain, freeze, soil moisture, or other sensors.
7. The central control software shall display the forecast weather for each controller several days in advance and shall enable automatic shutdowns of irrigation when the forecast temperature or chance of rainfall exceed a user-specified threshold.
8. The central control software shall have multi-user permissions for maintenance organizations, in which each controller shall have a designated owner who may then grant control access for specified controllers to other authorized personnel by email address.
	* + 1. Both crewmembers and controllers may be organized into named groups.
			2. Individual or group access may be granted or canceled at any time by the designated owner.
9. The central control software shall automatically alert owners and/or designated crewmembers via SMS text messages when selected alarms occur at a controller location, indicating the controller and the type of alarm for rapid response or repair.
10. The central control software shall detect any settings or scheduling conflicts between the software and the controller hardware and shall alert the user if a conflict is detected. The software shall have the ability to identify and display any conflicts and allow the user to decide which settings shall be used.

**Part 2 - Security**

1. The central control software shall use Transport Layer Security to ensure secure Internet of Things (IoT) communication.
2. Central control software users shall also be protected by a well-designed application layer security model that protects the settings and communications of each of user.
3. The central control software shall be protected by network layer security designed to minimize the potential attack surface.
4. The central control software shall be a cloud-based system, not an enterprise system, and shall not have or recognize enterprise security.

**Part 3 - Communications**

1. Irrigation controllers shall be connected to the internet and central control software via 2.4 GHz
Wi-Fi, Ethernet (LAN), or 4G LTE cellular communications.
2. Wi-Fi connections shall conform to 802.11 b/g/n standards with all necessary approvals and compliance for 2.4 GHz wireless devices and shall include an approved antenna.
3. Ethernet connections shall be made through a standard RJ-45 hardwired jack to the network via approved cable (CAT 5, CAT 5e, CAT 6, or equal).
4. Cellular connections shall be made through a compatible cellular data carrier, as appropriate in the host country, and shall include an approved antenna.
	* + 1. Connections shall be via 4G LTE with a compatible data plan (Cat-M1/LTE-M or NB-IoT networks).
5. Communication modules shall be installed internally or attached to the host controller.

1. Communication modules shall consist of robust construction designed for outdoor use when installed properly within the controller cabinet.

2. All communication modules shall indicate status of communications with the local router, network, and central control software.

**Part 4 - Compatible Controllers**

1. The irrigation controllers shall be supplied by the same manufacturer of the central control software and warrantied for use together as a complete system.
	1. The controllers shall be commercial-grade irrigation products suitable for outdoor or indoor use, with all necessary approvals.
	2. The controller manufacturer shall offer a range of models that are suitable for different applications, including economical controllers with up to 32- or 54-station capacity and heavy-duty controllers with up to 225-station capacity.
	3. The controllers shall include water-saving features such as Cycle and Soak, Delay Between Stations, rain sensor inputs with automatic shutdown, and manual or automated Seasonal Adjustment.
		* 1. Advanced ACC2 Controllers shall include a built-in flow monitoring ability with multiple master valves to monitor up to six flow zones.
			2. Intermediate ICC2 Controllers shall be equipped with one flow sensor input for system-level flow monitoring, reporting, and alerts.
			3. Residential Pro-C® Controllers shall be equipped with two sensor inputs for Hunter Clik and Solar Sync® Sensors.
	4. The controllers shall also be compatible with local, license-free remote controls that operate independently of internet connectivity. The remote controls shall be Hunter Industries models ROAM-KIT and ROAM-XL-KIT.

**Part 5 - Models**

1. The software shall be Centralus Irrigation Management Software, as offered by Hunter Industries.
2. The Wi-Fi communication module for residential Pro-C Controllers shall be Hunter Industries model PC-WIFI.
3. The Wi-Fi communication module for midsize ICC2 Controllers shall be Hunter Industries model WIFIKIT.
4. The Ethernet (LAN) communication module for midsize ICC2 Controllers shall be Hunter Industries model LANKIT.
5. The 4G LTE cellular communication module for midsize ICC2 Controllers shall be Hunter Industries model CELLKIT.
6. The Wi-Fi communication module for heavy-duty ACC2 Controllers shall be Hunter Industries model A2C-WIFI.
7. The Ethernet (LAN) communication module for heavy-duty ACC2 Controllers shall be Hunter Industries model A2C-LAN.
8. The cellular communication module for heavy-duty ACC2 Controllers shall be Hunter Industries model A2C-LTEM.
	1. The controllers shall be Hunter Industries models:
9. P2C-400: 4-station base model, plastic outdoor wall mount
10. I2CF-800-PL: 8-station base model, plastic outdoor wall mount
11. I2CF-800-M: 8-station base model, gray metal outdoor wall mount
12. I2CF-800-SS: 8-station base model, stainless steel outdoor wall mount
13. I2CF-800-PP: 8-station base model, plastic pedestal
14. A2C-1200-P: 12-station base model, plastic outdoor wall mount
15. A2C-1200-M: 12-station base model, gray metal outdoor wall mount
16. A2C-1200-SS: 12-station base model, stainless steel outdoor wall mount
17. A2C-1200-PP: 12-station base model, plastic pedestal
18. A2C-75D-P: 75-station base model (decoder), plastic outdoor wall mount
19. A2C-75D-M: 75-station base model (decoder), gray metal outdoor wall mount
20. A2C-75D-SS: 75-station base model (decoder), stainless steel outdoor wall mount
21. A2C-75D-PP: 75-station base model (decoder), plastic pedestal

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