Overview

Vantage is committed to help dealers design projects that are robust and responsive, thus building confidence in customers and dealers. Understanding station-bus *best practices,* is a critical part of a well designed system. This document shows multiple examples and recommends 36V controllers for most installations. The examples have a common approach, that approach assumes station bus runs in these examples are reaching design limits and wire length limits. There are times when a 24V controller with a single daisy chain station bus run is acceptable. For example, using a 24V controller for a retrofit project or a RadioLink project is often acceptable. However, keypad stations have greatly improved over the years and with the addition of so many 3-color LED buttons and LCD touchscreens on the station bus, Vantage has updated the station voltage requirements in Design Center to ensure the station bus is not overloaded and has sufficient "head-room" for proper 24-hour operation. This change in voltage requirements along with the *best practices* for station bus designs presented in this document will help InFusion System installers start with a solid plan.

Station Bus Best Practices

1. Use IC-36 or IC-DIN with PSU36-DIN for most projects. Plan for possible future expansions. A 36V station bus provides greater power and performs better on long station bus runs. Voltage drops over the length of any station bus run, that is why a 36V controller performs better than a 24V controller on larger systems; voltage has a higher chance of being at an acceptable level at the end of long runs.

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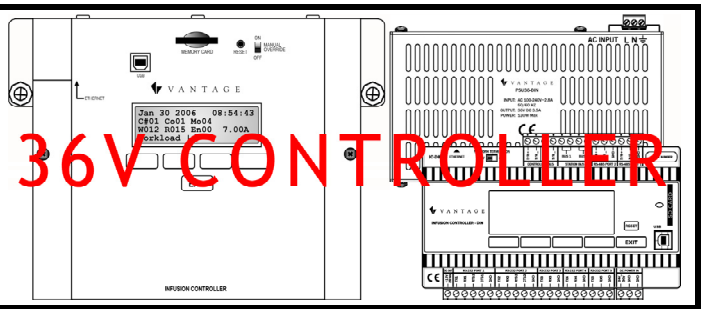

2. The Infusion Controllers IC-36, IC-24, IC-DIN must be earth grounded.

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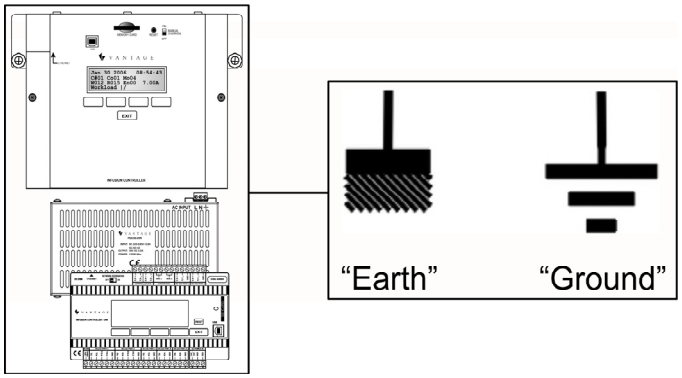

3. Use Vantage station bus wire sold in 1,000ft. rolls, part number VDA-0143. or equivalent. **Using smaller gauge wire or non-qualified wire will reduce system stability.**

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Vantage Station Bus Specification:
600V Insulation, 2C, 16AWG / 1.31mm2, twisted, non-shielded, <30pF per foot.

4. Do not run station bus near any other parallel high or low voltage wiring. Separate a minimum of 12" / 30.5cm from all other parallel wire runs. This limits noise and interference on station bus and vice-versa, limits noise and interference on other wire runs. Unwanted noise on communication lines can cause errors in communication.

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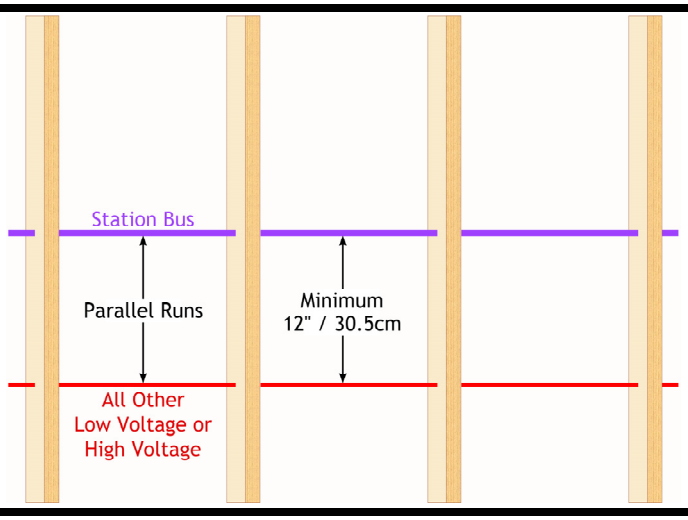

5. The station count on a bus assumes an even distribution of stations. Clustering a majority of the stations near the end of a run will be problematic. Possible solutions:
   - Relocate the controller or
   - Add another controller

   .

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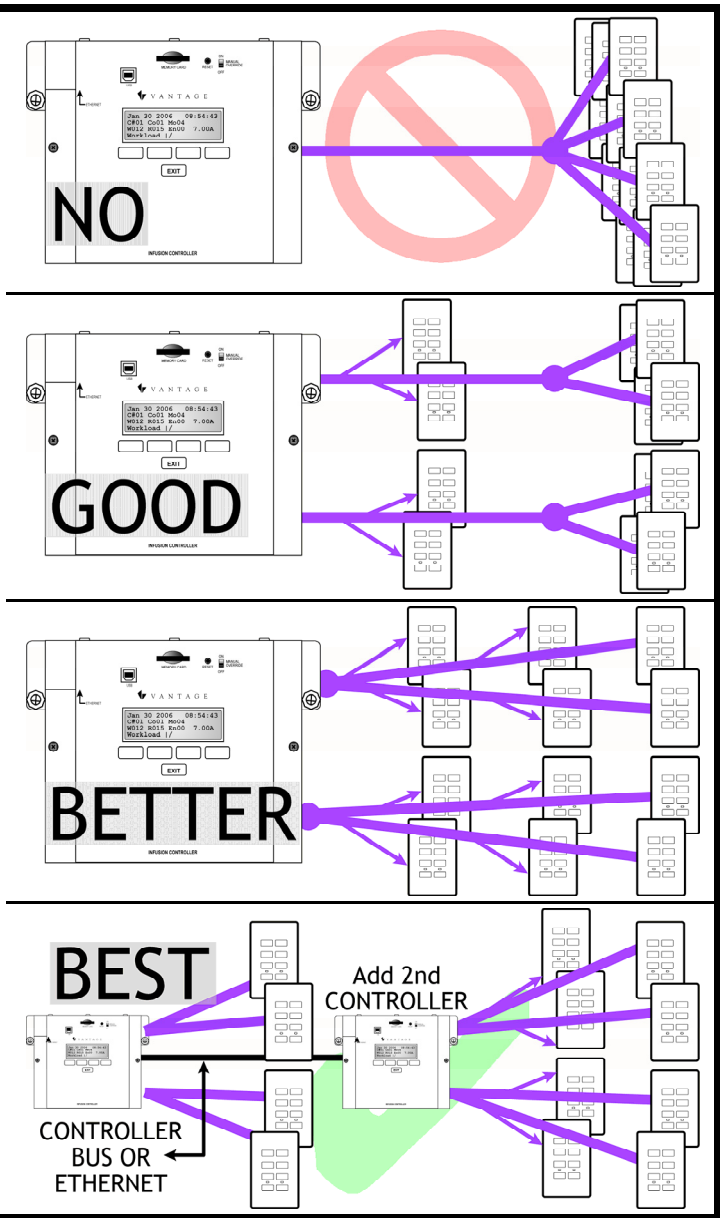
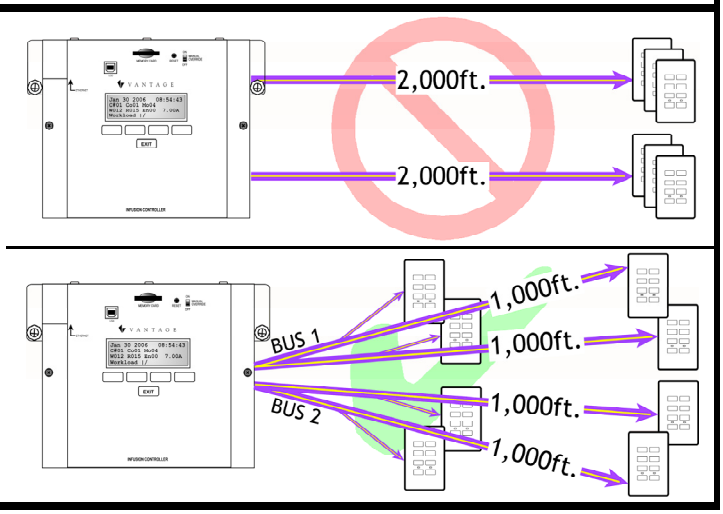
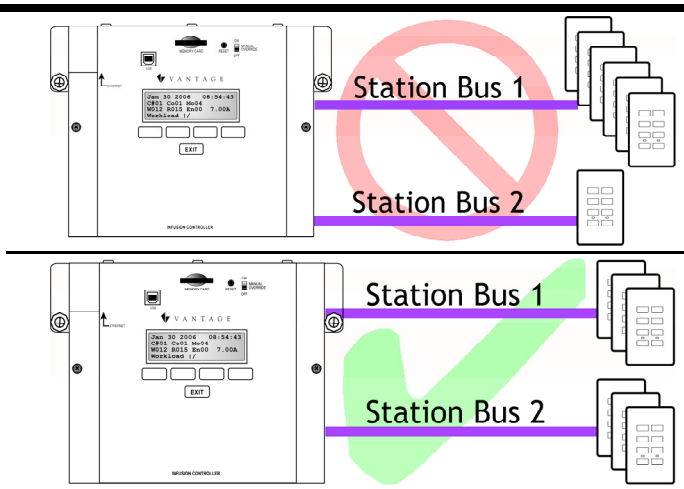


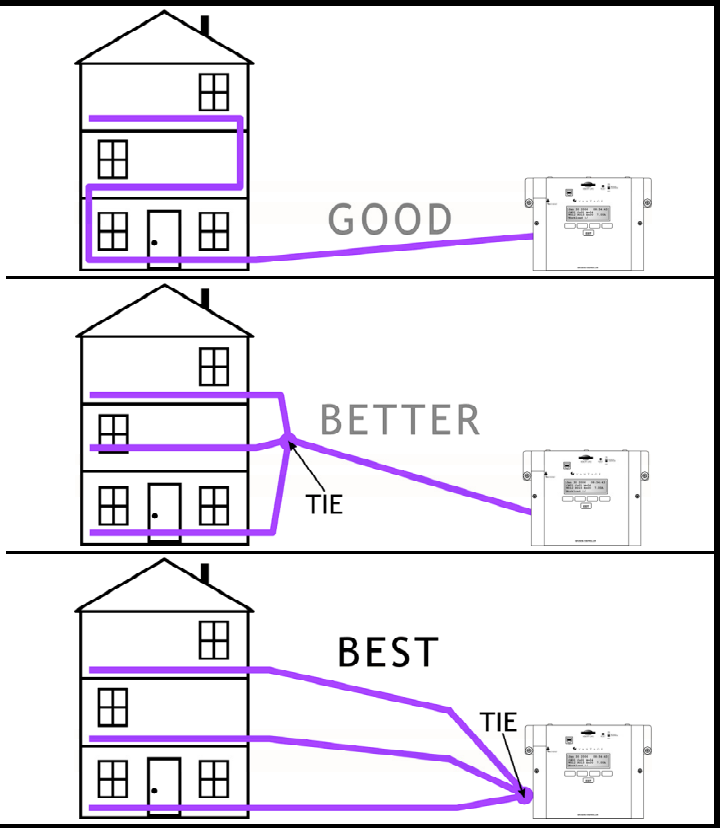
6. Distribute stations along the entire station bus. This requires proper location of Controllers.
   - No Station more than 1000 feet from a controller
   - Stations distributed along the entire station bus
   - No more than 2000 feet of cable per station bus
   - No station bus run longer than 1000 feet



7. Design projects to balance stations on both station bus runs. For example if a single controller is configured with maximum stations and/or load power, split the stations between each bus. Real installations may not split evenly, but balancing the stations on all station bus runs helps insure better power and communication to all stations. Make sure Design Center matches the actual station bus runs if typing station serial numbers into the Design Center project.

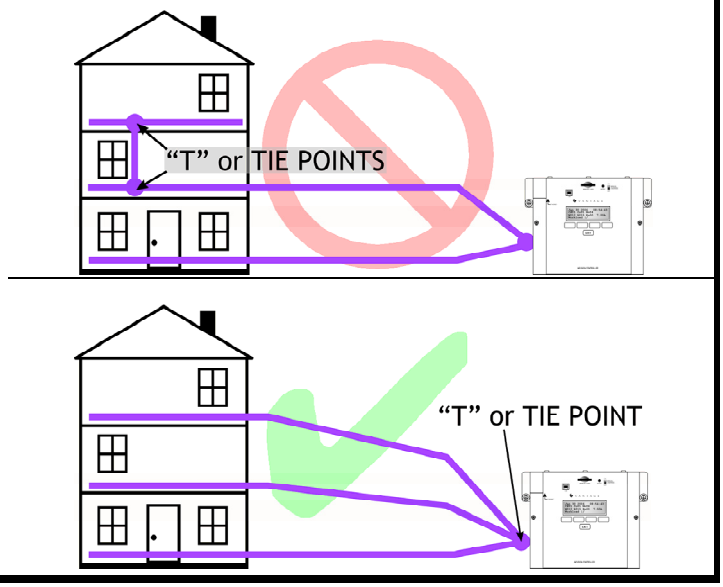


8. Daisy chain runs are fine on smaller systems, but use multiple station bus runs and tie the runs together as close to the controller as possible for larger systems. For example, in a three story house run three, separate station bus runs (one for each floor) and have them tied together as *near* the controller as possible for maximum voltage and communication at each station connected to the controller.



9. Avoid “T” connections to add station bus to large areas that are distant from the controller. For example, in a three story home, do not use a “T” connection to connect another floor that has substantial area and a large number of keypads. Remember, long station bus runs loaded with many stations on the run reduces the voltage on the station bus run. Voltage at the end of the run is lower. Reduced voltage can cause station bus errors. Use care to make sure each station bus run is not over 1,000ft and that all runs connected to station bus run 1 or 2 do not total more than 2,000ft.

Exception to this rule: If the system is small enough or the “T” run is short and only adding one or two stations, the “NO” wiring example at right is an acceptable practice.



10. Auxiliary ground connections should not be tied to earth ground. Ground loops can disrupt station bus communication and must be avoided.

Grounded Equipment:

- If external equipment has earth ground and is going to be connected to auxiliary connections on keypad stations, CIS stations, CIS10-DIN stations, or other stations, care must be taken to make sure the contact input is isolated from earth ground.
- If the power plug looks like this example – 3-prongs – the equipment is usually earth grounded.

Output Not Grounded Equipment:

- Connected equipment that does not have an earth ground on the output or is internally isolated is usually okay.

Equipment Not Grounded:

- If the power plug looks like this example – 2-prongs – the equipment is usually not earth grounded.

***WARNING:**

- Do not defeat attached equipment's earth ground if present.

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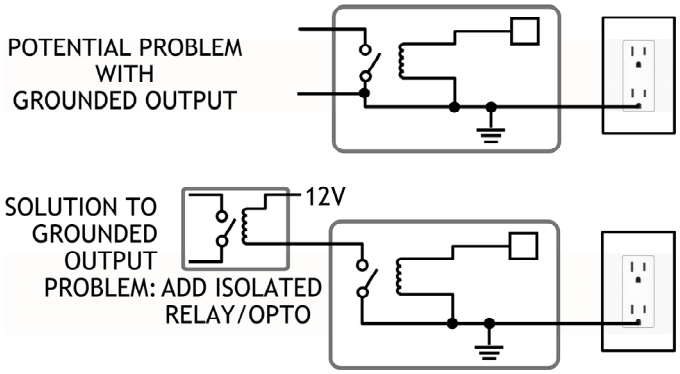

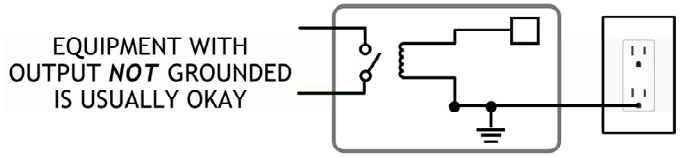

11. In Design Center individual station power specification does not account for equipment connected to the auxiliary connector. The auxiliary connector provides **12V** and is rated for **15mA**. This requires approximately **0.5W** of power from the station bus if fully loaded. This must be taken into account manually. A good practice would be to *know* the sensors power draw against the 15mA available and to not exceed that.

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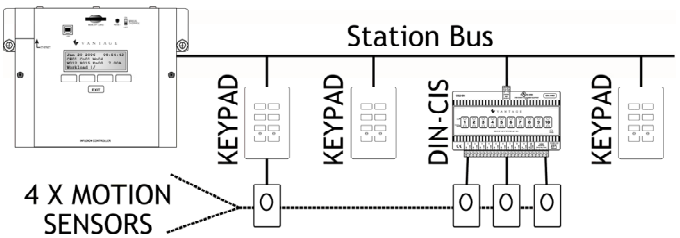

12. The Contact Input Stations, CIS and CIS10-DIN station's 12V output is rated at 50mA. This requires approximately 1.5W of power from the station bus if fully loaded. This must be taken into account manually.

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13. Be mindful! Do not overload the *combined* **12V, 15mA** output on keypad auxiliary connections or the *combined* **12V, 50mA** output on Contact Input Stations. Overloading these stations may result in unreliable communications to this station. "Know" the mA draw of connected motion sensors powered from the auxiliary outputs. A good design guide is,

- one motion sensor per keypad and three motion sensors per CIS for 15mA sensors, or
- two motion sensor per keypad and six motion sensors per CIS for 6mA sensors.

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