

Application Note #5461

Using an HTplus Backbone to Reduce Polling Times for Serial Network.

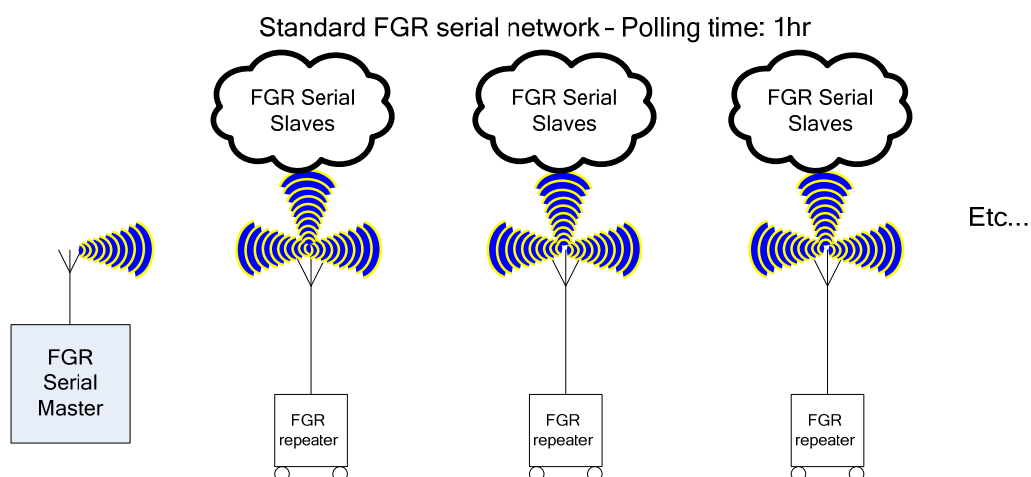
May 13, 2008

A standard serial network can have hundreds, if not thousands, of slave or endpoint radios reporting back to a single network master. Using an HTplus backbone, it is possible to use multiple masters to poll the slave radios from a central location.

The HTplus network will extend a high speed Ethernet connection into the field. The serial ports on the HTplus can then be used to connect to an FGR Serial Master. The HTplus will act as a terminal server, converting Ethernet data to Serial data. Because the HTplus has two serial ports, it is possible to connect two FGR master radios to each HTplus radio. It is then possible to poll both FGR Master radios at the same time. If the FGR slaves in the field are then programmed evenly between the two FGR masters, the polling time is reduced to 1/2 the original time. For each FGR serial master, polling times for the slave field will be reduced. Adding a second master to the serial network in this manner will reduce polling times by half. A third radio will cut the time to 1/3. A fourth to 1/4, etc.

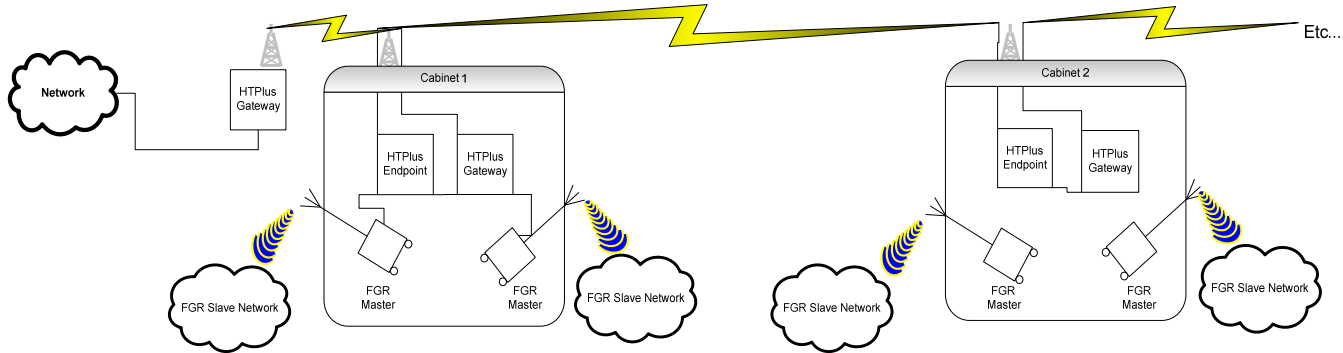
Additional throughput can be gained by using a back-to-back repeater location for the HTplus radios. By wiring an HTplus Gateway directly to an HTplus Endpoint, the 50% throughput loss from having a repeater is removed. See Figure 2 for an example of this.

Figure 1:



Taking the network from Figure 1, dividing it into 4 networks and removing the repeaters, the polling time is reduced to 7.5 minutes.

HTplus Backbone Network – Polling time: 7.5 mins.



Figures 3&4 are two examples of how to connect the HTplus to the Serial Master:

Figure 3:

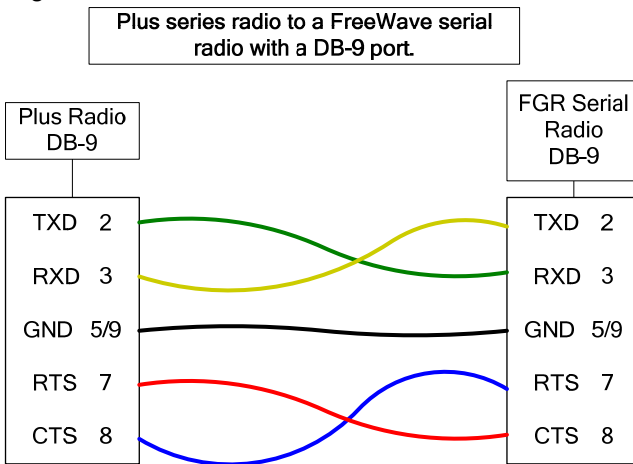
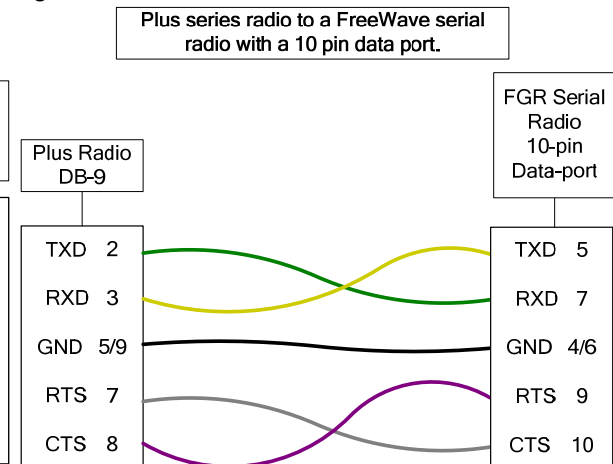


Figure 4:



Important Note: Because both the HTplus serial ports and Serial Master radio are DCE devices, a null-modem or crossover connection is required.



In order to take advantage of an HTplus backbone network, the host software does need to be capable of polling via TCP/IP.

In addition to the security already offered by FreeWave radios, the HTplus radios also offer 128-bit AES encryption, Radius authentication, MAC-address filtering, and VLAN tagging.

If two serial masters are going to connect to a single HTplus radio, it is possible for them to use one antenna. The two serial masters can be set up using MultiMaster Synch. For details on how to set up Multi-Master Synch, please see application note: LAN5412AA Rev B. The RF ports of the FreeWave serial Masters can then be connected via a Power Combiner such as the ZAPD-1 made by Mini-Circuits. This will reduce installation cost as only one antenna and one run of coax are needed. A separate antenna and coax cable will be required for the HTplus radio.

NOTE: a vertical separation of 10 feet is suggested between two antennas of similar frequency which are mounted on the same structure.