SMG Troubleshooting Guide

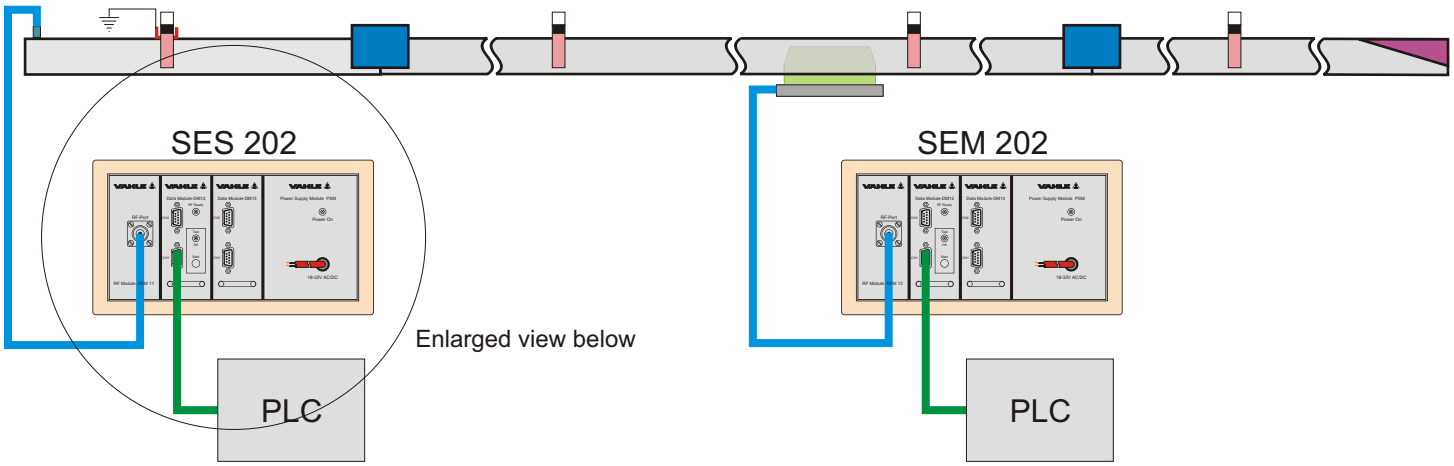

Figure 1 - Typical SMG System Configuration

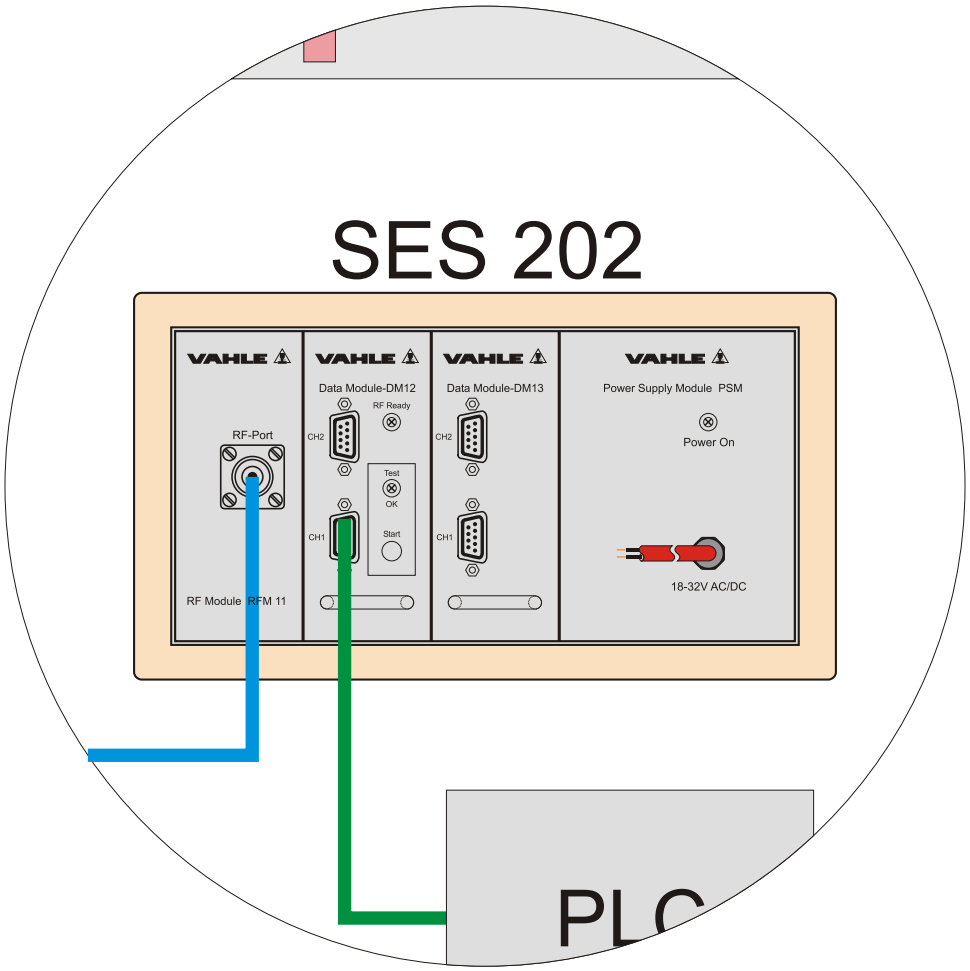

Figure 2 - Enlarged View of Transceiver

Step 1 - Check for obvious faults.

- check the transceiver RF-ready (receiving) lights on the stationary and mobile transceivers. If an RF-ready light is not on or steady, replace the RF module in the sending transceiver. If this does not fix the problem, proceed to Step 4.

- disconnect the RF and data cables and perform the self-check. If the self-check fails, proceed to Step 5. Note: the self-check is of limited use since is known that it is not operational on some data module configurations.

Step 2 - If the RF and self-check are OK, bypass the entire SMG system with a new data cable between the two PLCs (see figure 3). If communication errors disappear, an SMG problem is confirmed. If communication errors persist, the SMG system is not at fault. Be certain the new data cable is properly connected to the assigned connector pins and the ground and shield are properly connected.

Step 3 - If bypassing the SMG system eliminates communication errors, bypass the waveguide and antenna with a new RF cable connected between the two transceivers (see figure 4). If communication errors disappear, a waveguide, antenna, or rf cable problem is confirmed. If the communication errors persist, a transceiver or data cable problem is confirmed.

Step 4 - If a waveguide/antenna/RF cable problem is confirmed, do the following:

- visually inspect waveguide/clamping sleeves for any evidence of physical damage.
- check to be certain the waveguide is clean and level along the entire track.
- check to be certain waveguide is properly terminated.
- check to be certain a directional antenna is oriented correctly.
- be certain all rf connectors are tight, clean, and dry.
- replace any auxiliary straight or angled rf connectors.
- replace the stationary and mobile rf cables.
- replace the mobile antenna.
- replace antenna switch/proximity sensor, if used.
- replace the SAN 1 or SAN 2 (rarely necessary).

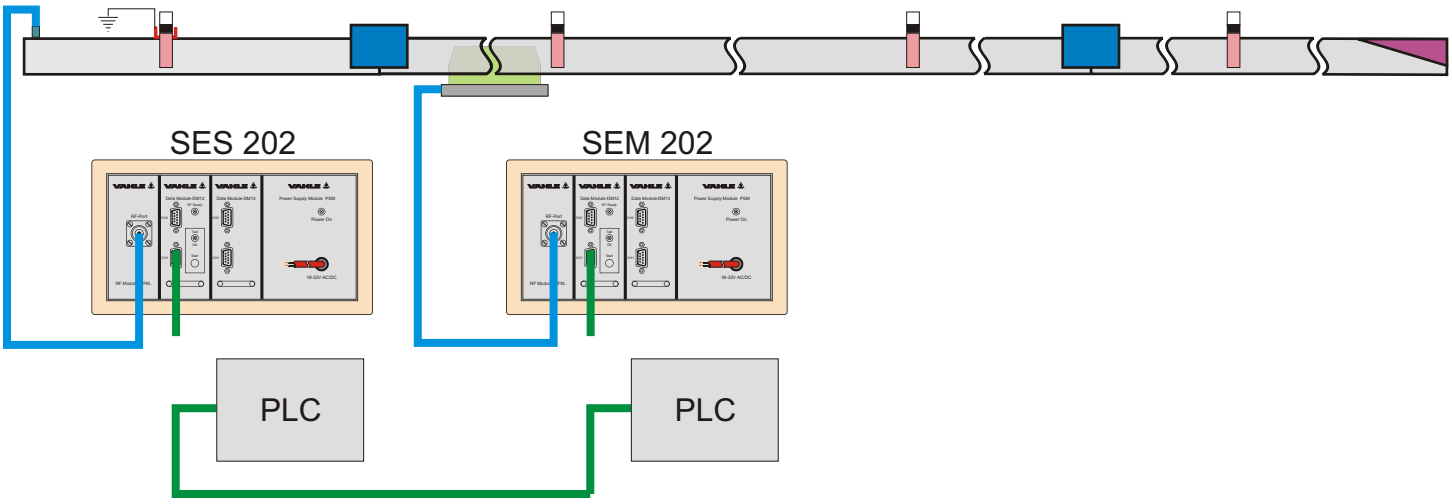

Figure 3 - Bypassing the Entire SMG System

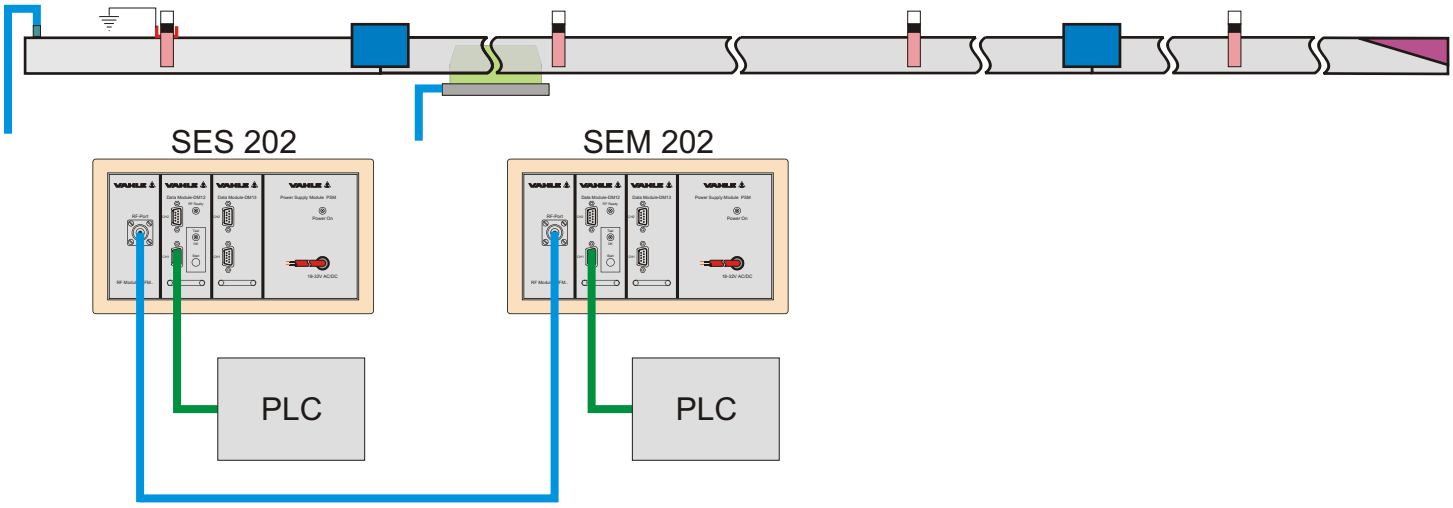

Figure 4 - Bypassing the Waveguide and RF Cables

Step 5 - If a transceiver/data cable problem is confirmed, do the following:

- be certain the data cables are okay (not always obvious - if any doubt, replace them).
- be certain the data cable shields and grounds are properly connected.
- be certain the data cables are not in the proximity of power or drive cables.
- be certain the PLCs are properly terminated (if they are the end devices on the bus).
- be certain the power to the transceiver falls within specification.
- reseat the interface modules and be certain the termination and data rate settings are correct.
- replace the interface modules.
- reseat/replace the data modules.
- be certain the RF level is within specification (variable attenuator is better than RF meter).
- replace the RF modules.
- replace the power supply modules.

Necessary tools and equipment

• complete set of spare modules, cables, antennas, switches, etc. (mandatory)

- small & medium slotted & phillips screwdrivers
- small & medium wire cutters/strippers
- small & medium needle-nose pliers
- medium vice-grip pliers
- medium adjustable wrench
- variety of Phoenix screw-type D-connectors
- straight and angle coax connectors
- variable attenuator (more useful than the RF strength meter)
- multimeter
- oscilloscope
- laptop computer

Note: the oscilloscope and laptop are useful to view and record the PLC data signals.