



## Q&A

### How do I extend voice circuits from the E&M port on the PBX to a POTs at a remote location using E&M and FXS cards?

---

**Q:** How do I extend voice circuits from the E&M port on the PBX to a POTs at a remote location using E&M and FXS cards?

**A:** At the PBX site, the customer connects an analog E&M port on the PBX to an ADTRAN E&M card. At the remote site, POTs are connected to FXS cards. The E&M card must be connected to an E&M interface on the PBX.

Unlike a POTs line, E&M does not have a DC offset on the talk path. The talk path is on a set of wires that are separate from the 48 VDC signaling lead wires. The voice signal is modulated onto the tip and ring when operating in a 2-wire full duplex configuration. In the 4-wire configuration, the voice is transmitted onto the T R pair and received on the T1, R1 pair.

The signaling (on hook, off hook) is still done with 48 VDC but it rides on the E & M leads. The PBX is a "M lead originate" device and the ADTRAN E&M card is an "E lead originate" device. When the PBX wants to place a call, it raises the M lead. The PBX does this by applying 48 VDC to the M lead. Our E&M card sees 48 VDC and converts that 48 VDC into signal bits. The remote FXS card sees the bits coming from the other side and converts the signal back to analog loop start and rings the phone. When the phone goes off hook, the FXS card sends signal bits back to the E&M card. The ADTRAN E&M card at site A converts the bits back into an analog state by grounding the E lead. Now current is flowing from PBX A into the ADTRAN E&M card A. The originating PBX A has now seen the E lead return high and the connection is complete.

---