

TB-110: Converting Between Single Ended and Differential Signals

EPC offers two converters that convert single-ended output signals to differential signals, and vice-versa: the RX/TX Converter and the RX/TXD Receiver-Transmitter.

The **RX/TX** and the **RX/TXD** both convert single-ended signals into differential (RS422) signals for superior noise immunity. This allows an existing encoder with a single-ended output (Open Collector, Pull-up, or Push-Pull) to be used in applications where the differential signal type is required.

Likewise, both devices can work the opposite way by converting a differential signal back to a single-ended push-pull signal.

Although similar, these two devices are slightly different. The RX/TX Converter has one function: to convert the signal. The RX/TXD, on the other hand, can perform four functions: converting, splitting, repeating, and even testing the encoder signal.

The RX/TXD offers up to three outputs in any combination of differential and single-ended. This can be useful when attempting to operate multiple loads (i.e., controller or counter) from a single encoder, especially when input requirements differ.

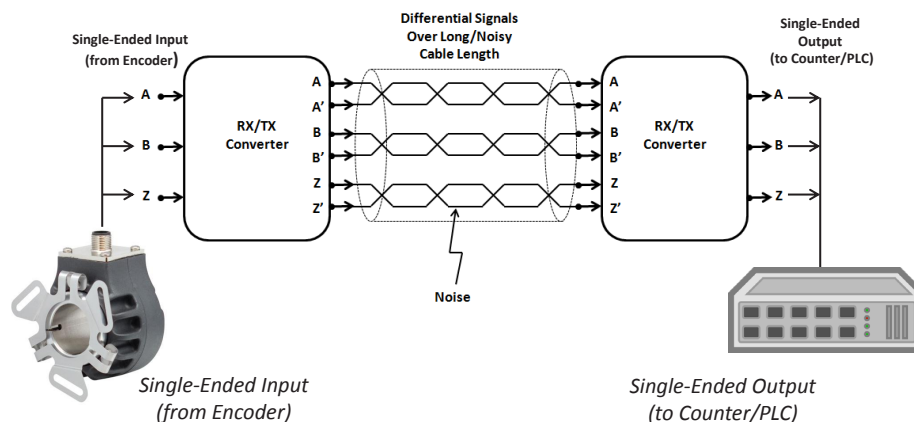
In addition to providing correct input signals, the RX/TXD can be used to increase signal integrity over long or noisy cable runs when both the encoder and controller/counter are configured for single-ended signals. By converting to differential signals for long or noisy cable runs, the signals will be much more robust and can be converted back to single-ended signals before going into the counter/PLC.



RX/TXD Receiver-Transmitter



RX/TX Converter



These devices can also help when updating an older system. Differential signals offer inherently better electrical noise immunity. If the existing counter or PLC will accept the differential inputs, but the encoder has only single-ended outputs, installing an RX/TX Converter or RX/TXD Receiver-Transmitter allows the old encoder to communicate with the controller. This is particularly useful when the encoder signal has to travel over long/noisy cable runs.

Any time there is an output/input mismatch between the encoder and counter or PLC, these devices can facilitate communication. If you have additional questions please contact EPC Customer Service at 800-366-5412 or email sales@encoder.com.