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APPLICATION GUIDE

Current transducer cabling principles

Introduction

In the N4L document reference D000132 “Current transducer interface options – selection guide”, different connection cables are defined for applications where the transducer is more than 6 meters away from the measurement instrument. This brief application guide explains why.

Considerations

While it is generally understood that most closed loop zero flux current transducer designs require a -15V 0 +15V supply, many users do not recognise that the current drawn is proportional to the primary current being measured and therefore the required power supply capacity and supply cable volt drop is often underestimated.

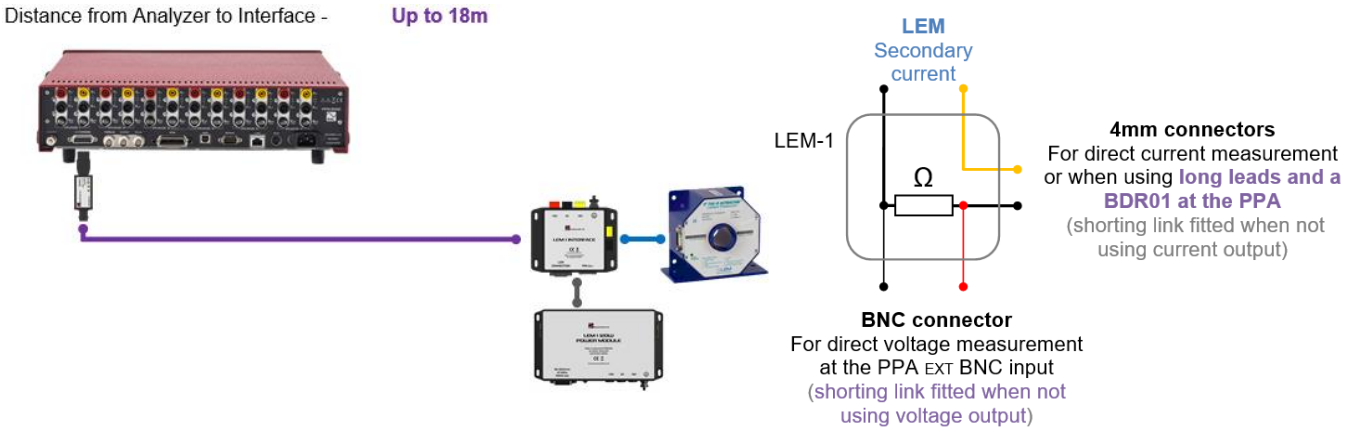
Given a minimum supply voltage defined for most LEM transducers of ±14.25V, it follows that the voltage drop on supply cables to the transducer should not exceed 750mV. Clearly this is not a limitation when using smaller transducers that require relatively low current but as transducer size increases along with the associated supply current, there is an increased risk of low voltage at the transducer power input terminals.

Distances up to 6 meters

With up to 6 meters between either a LEM-6 or LEM-1 interface unit and the associated Current Transducer, a DSUB to DSUB connection cable provides the simplicity of a single direct connection that combines both the power and signal conductors in one cable.

Distances above 6 meters

With a distance to the Current Transducer above 6 meters and the common situation where large distances are associated with large transducers, the optimum method to avoid under voltage supply rails to the transducer, is to position the power source and associated LEM Interface near to the transducer as illustrated here:



An additional advantage of this connection technique for applications involving a large distance between the measurement instrument current transducer, it that the long cable length uses coaxial wire rather than multicore DSUB to DSUB cable, so there is superior resilience to residual electrical noise while also being more flexible.

Conclusion

While no single connection technique can be ideal for all current measurement applications, a good solution that accounts for all primary sources of error will be achieved by following the N4L “Current transducer interface options – selection guide”.