



Sharing Temperatures Between SEL-2414 Transformer Monitors

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INTRODUCTION

Transformer monitoring requires temperature inputs to correctly model thermal activity and its impact on the oils and insulation within the transformer. An RTD (resistance temperature detector) input card or an external RTD module is needed to acquire these temperatures for use in the SEL-2414 Transformer Monitor thermal model. Because the thermal model only needs four of the available ten temperature inputs, one RTD card is enough for two SEL-2414 Monitors. The customer realizes a cost saving and has an extra slot for additional digital or analog I/O. This application note covers several features of the SEL-2414, particularly how to transmit temperature information from one SEL-2414 out to another SEL-2414.

SEL SOLUTION

The SEL-2414 allows users to monitor critical substation assets with comprehensive transformer thermal monitoring per IEEE C57.91-1995 *Guide for Loading Mineral-Oil-Immersed Transformers*. With the thermal model, users can calculate top-oil and hot-spot temperatures, insulation aging acceleration factors, and loss of life, while generating hourly and daily data about a single three-phase transformer or three single-phase transformers. The SEL-2414 also gives users the ability to customize a series of I/O and temperature acquisition options, including the external SEL-2600 RTD Modules, an internal RTD card, or remote analog values. The SEL-2414 is unique in the fact that it allows the user to use remote analogs, which are converted from IEC 61850 GOOSE messages as temperature inputs.

Using an internal RTD card, the SEL-2414 receives up to ten temperatures. The thermal model only requires four temperatures per three-phase transformer. Another four temperatures are collected for a second transformer and transmitted to a separate SEL-2414 via IEC 61850 GOOSE messaging, which transforms these temperatures into remote analog values for use in its thermal model.

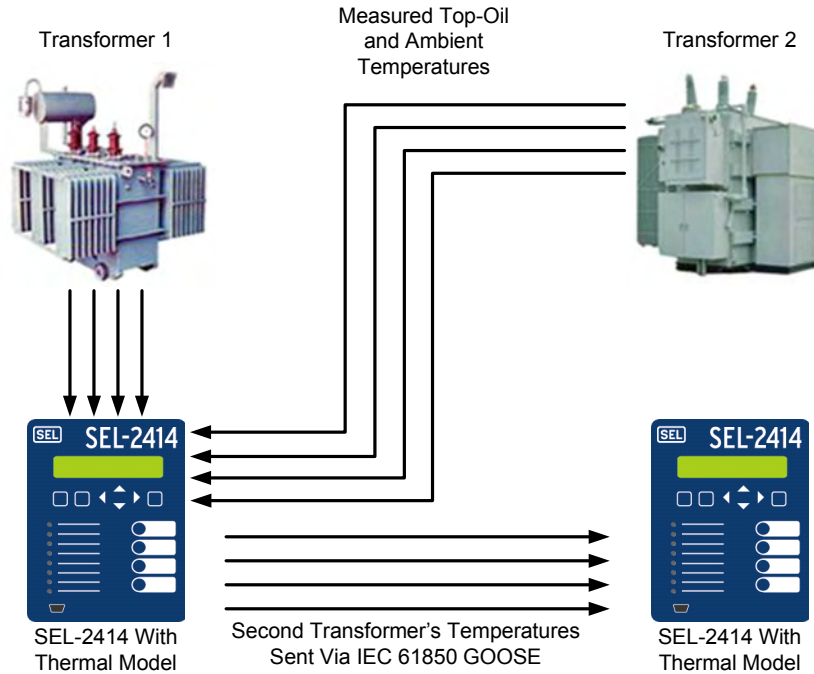


Figure 1 Monitoring multiple transformers using a single RTD card and IEC 61850 GOOSE messaging

This thermal model feature frees up additional slots in secondary devices that would otherwise need their own temperature acquisition apparatus. The SEL-2414 also receives temperatures from the SEL-2600, boosting the total number of temperature points to 22. These points are used for additional transformer monitoring or measuring other temperatures around a substation.

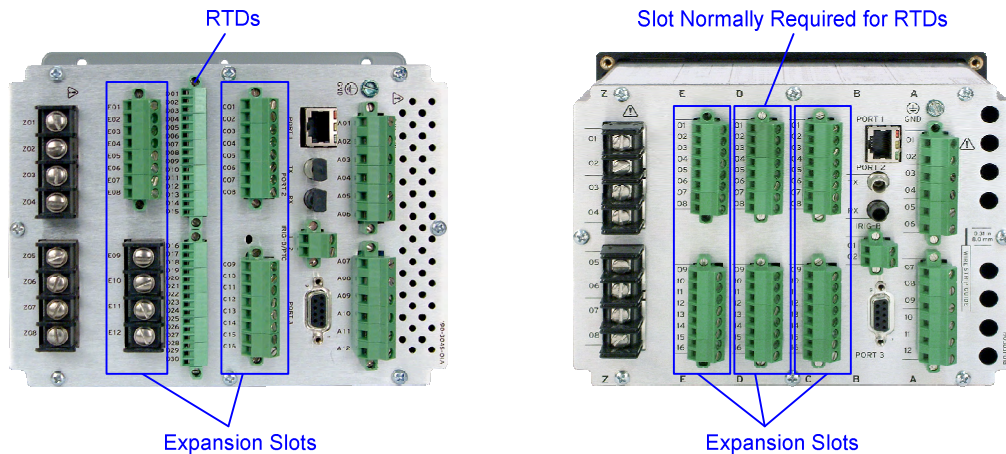


Figure 2 SEL-2414 on left has RTD card, SEL-2414 on right can have extra I/O

All SEL products are industrial rated with an operating temperature range of -40° to $+85^{\circ}\text{C}$, a vibration tolerance up to 15 g shock, and the option of conformal coating on all circuit boards, making them ideal for transformer monitoring applications.