Using the t-Rx7100 Shunt Augmenter Auxiliary Output as an ACDC or Style-C Track Driver

Summary

A common rail/highway grade crossing scenario is a signalized railroad crossing where the roadway crosses both the mainline and an adjacent siding or industrial spur track. An example of this is shown in Figure 1.

A predictor or motion sensor is often used to actuate the signals for mainline train movements and the spur or siding, depending on train speeds and other circumstances, may justify an "island only" track circuit.

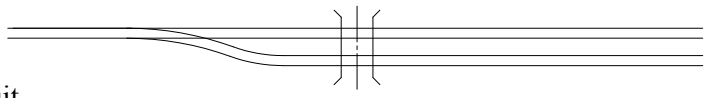

Fig. 1

If the mainline or the siding has insufficient traffic to keep the rail/wheel interface free of rust and other contaminants, consistent shunting of the rails to operate grade-crossing signals and gates becomes a problem. This may warrant the installation of a rail/wheel shunt augmenter or shunt enhancer such as the Genesis t-Rx7100 Shunt Augmenter.

Because the mainline track circuit must be electrically isolated and separate from the island track circuit, a single t-Rx7100 Shunt Augmenter cannot be used for both tracks. To provide shunt augmentation or enhancement for the adjacent track circuit, a second t-Rx7100 could be used, provided the island only circuit uses audio frequency type detection equipment such as AFTAC, MRTC, RSI, etc.

With the t-Rx7100 Shunt Augmenter also serving as an ACDC track driver, you eliminate the cost of the track driver.

Using the t-Rx7100 as an Island-Only ACDC Track Driver

Another option is to use an "ACDC," or as it's sometimes called, a "Style C" or "Ring-10" type track circuit. This can be accomplished by using the AUXAC/AUXRET outputs of the t-Rx7100 Shunt Augmenter as an ACDC track driver since it provides a continuous source of about 8 or 9 VAC power when operating on either commercial 120VAC power or 12VDC backup battery power.

With the t-Rx7100 Shunt Augmenter doing double duty as a shunt enhancer and an ACDC track driver, you gain some significant benefits. These are:

- a track driver at no additional cost that can operate on commercial AC power or 12VDC battery;
- a track circuit with excellent shunting capability;
- a track circuit that is simple to design and maintain; and
- a track circuit that is reliable and costs less than other types of track circuits.

Additional components required for the island-only ACDC track circuit include:

- two power resistors - one track current limit resistor and one relay current adjust resistor;
- one biased-neutral DC track relay;
- one pair of AWG #6 (twisted) track wires;
- lightning protection for ACDC track circuit;
- hookup wire, ring terminals, etc.;
- four insulated track joints; and
- one ring-10 track diode.

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Wiring the t-Rx7100 as an ACDC Track Driver

An example wiring diagram of a typical application is shown in Figure 2. Although this example is likely to be somewhat different from what your application will require, the inherent simplicity of the ACDC track circuit should make adapting the t-Rx7100 AUXAC outputs as a track driver quite easy.

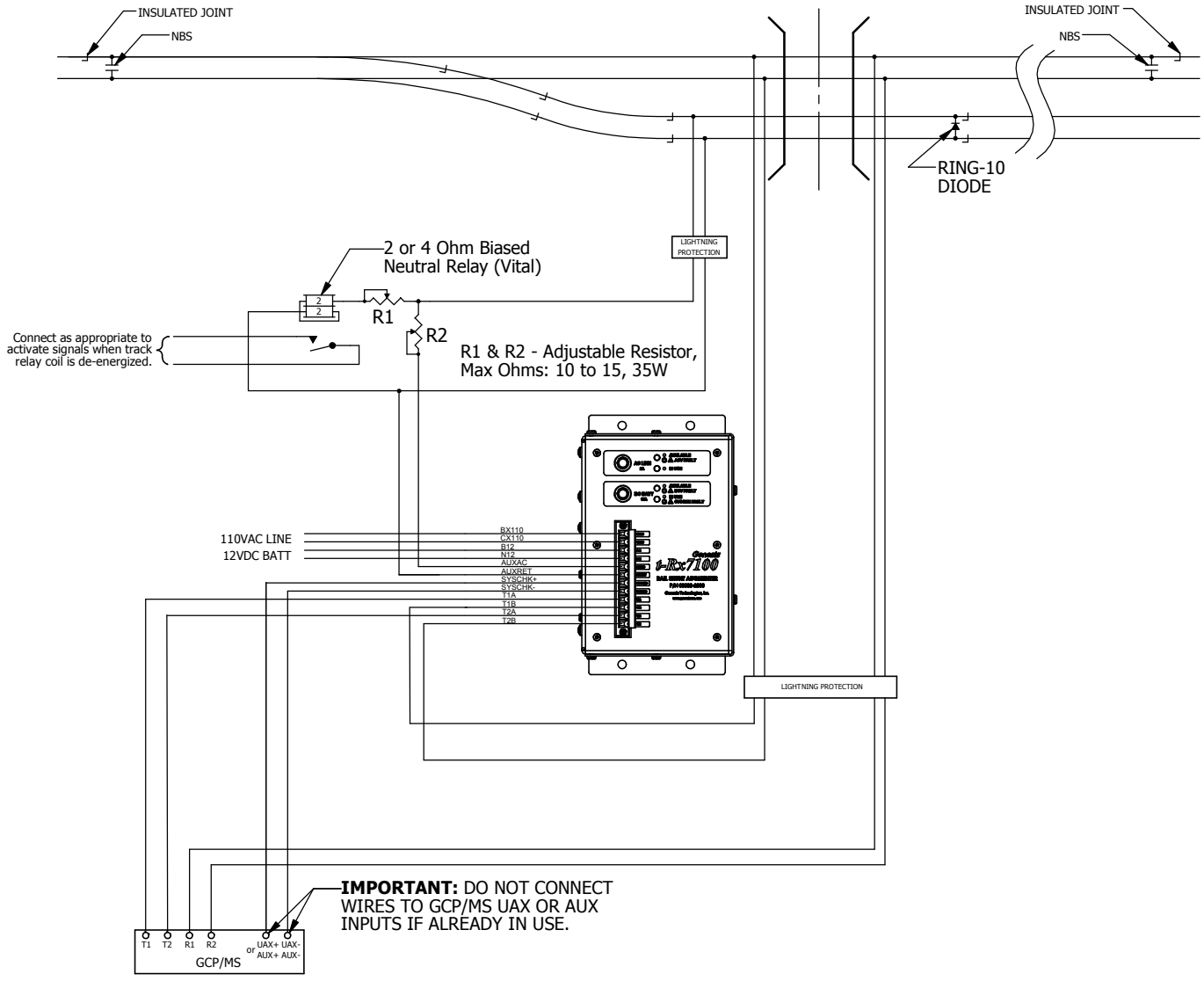

Figure 2 - Example of Typical Wiring Connections using the t-Rx7100 as a Shunt Augmenter and an ACDC Track Driver

Please note that the track wires (the wires between the signal system lightning protection inside the signal equipment enclosure and the rails) should be AWG #6 twisted pair.

The ACDC track relay should be wired into the signal system such that it will break the XR (crossing) circuit when not picked, thereby activating the signal/gate system when the ACDC island is occupied. Follow your railroad's recommendations or instructions for adjusting the track and relay resistors. Also, be sure to test the ACDC circuit for proper shunting using a 0.06 Ohm shunt between the island rails at the end where the ring-10 diode is installed.

Conclusion

If a signalized rail/roadway grade-crossing needs shunt augmentation/enhancement and also has need of adjacent track island-only train detection, the t-Rx7100 can readily accomplish both tasks with substantial benefits, both in function and cost savings.