GE Renewable Energy
Application Note

Application and Settings of the Hot Line Tag Function in the GE 850R Recloser Control

August 24, 2020

Applies to firmware versions: 2.6 and 2.7

Application

Hot-line tag (HLT) protects line personnel working on a de-energized line. With recloser control, the reclosing function poses a danger if an accident occurs on an energized line. Once tripped, reclosing restores power, which could energize a line when it is not wanted. Typically, hot-line tag performs the following functions:

- Disables all reclosing
- Disables remote (SCADA) and local, manual closing
- Enables an instantaneous overcurrent element (IOC, IEEE 50, IEC I>>) dedicated to HLT

A hot-line-tag function is provided with the GE 850R recloser control. This application note describes the required settings in the 850R control that provides the functionality for HLT as well as proper targeting and event recording. Common settings are shown, as well as specific settings for both three-pole and single-pole tripping applications.

Settings shown are taken from an 850R connected to a PC using the GE Multilin EnerVista 8 Series Setup software, which can be obtained from the Software/Firmware link on this page: https://www.gegridsolutions.com/multilin/catalog/850.htm

Common settings

Figure 1 shows the Common Setup settings in the Recloser Trip Close Logic. Confirm (assign) pushbutton PB 6 is programmed to the HLT function at **Hot Line Tag Input**. Confirm or make the settings highlighted in red. For three-pole tripping applications, the **Force 3 Pole Trip Initiation** setting shown is not necessary. For single-pole applications, assign pushbutton PB 6 to **Force 3 Pole Trip Initiation.** There might be circumstances where the **Force 3 Pole Trip Initiation** setting will be used for other functions. In this case, use FlexLogic to OR the functions needed to force three-pole initiation.

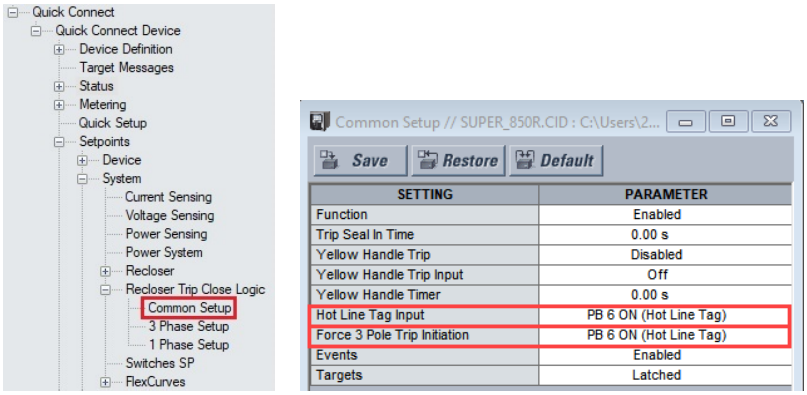


Figure 1. Recloser Trip Close Logic > Common Setup settings (single-pole application)

Force to lockout

There are two methods to force the recloser control to lockout.

All Phase LO Initiation

By factory default, hot-line-tag pushbutton PB 6 forces lockout when configured in the setting **All Phase LO Initiation**, shown in Figure 2. If you want to use this setting for another function, then use the second method (To Last Shot).

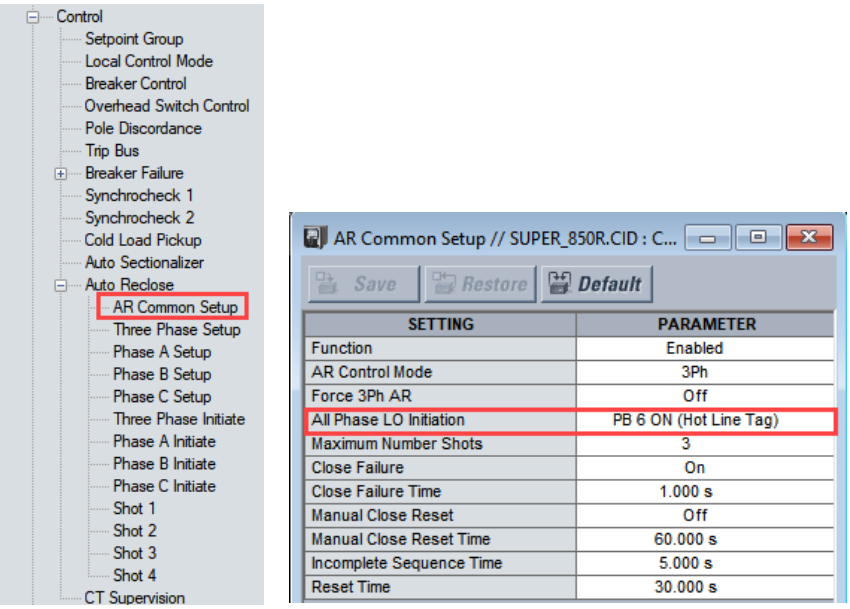


Figure 2. Auto Reclose > AR Common Setup settings

To Last Shot

Figure 3 shows the Control > Auto Reclose setup settings that force the recloser control to lockout for a hot-line tag condition. The setting **To Last Shot** forces the recloser to the last shot when pushbutton PB 6 is on (HLT is True). Any subsequent trip locks out the recloser and prevents closing. Make or confirm the following settings shown in red. For single-pole-tripping applications, make the Phase A (shown), Phase B and Phase C Setup settings. For three-pole-tripping applications, make only the Three Phase Setup settings.

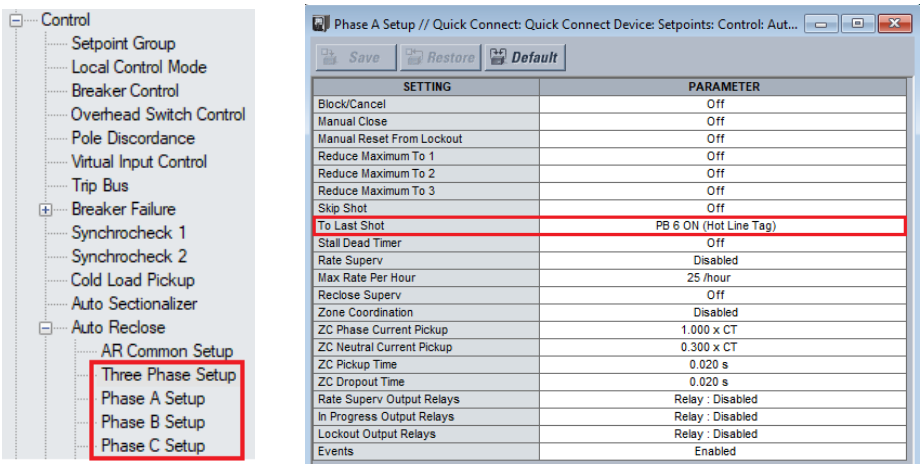


Figure 3. Auto Reclose > Phase Setup settings

Assigning hot-line tag to Auxiliary Relays

Figure 4 shows the settings for the 850R trip and close relays. Please note that your virtual-output numbers may differ from this example. Map all trip and close contacts in Recloser > Recloser Setup—do NOT use the Outputs > Output Relays settings, which are shown in Figure 8, along with blocking settings.

It is NOT RECOMMENDED to assign recloser/switch opening and closing to discrete output relays. However, if you want to HLT block discrete output relays [see Figure 8], then you must configure HLT blocking, as described in the section *Contact blocking*.

These examples are for 850R recloser applications, where you select output relays for the trip and close functions at System > Recloser Trip Close Logic actions. For 850R switch applications, select open and close relays at System > Switches SP.

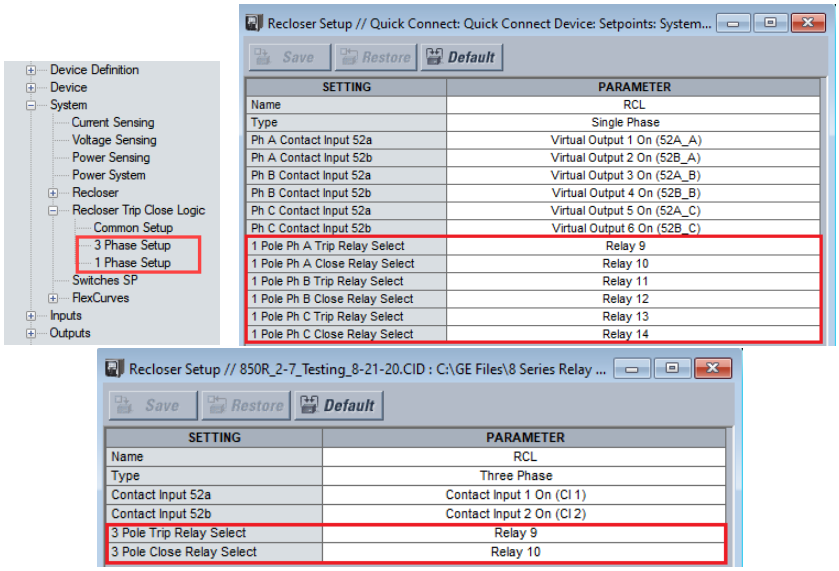


Figure 4. Output-relay settings, 1 Pole and 3 Pole

Prevent logging of local/remote, close-initiate events

The HLT function does not stop a manual close from being initiated, however, it blocks the close outputs from closing. This action benefits post-event analysis for personnel working with the device. However, to prevent logging of the local and remote close-initiate events; apply the logic in Figure 5. This logic blocks the close pushbutton (PB2 by default) and any external contact input (CI 1 shown here).

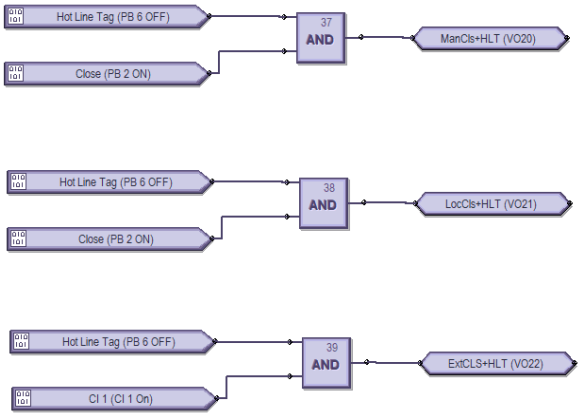


Figure 5. Pushbutton and external blocking logic

To use this logic, use the settings shown in Figure 6. Please note that your virtual-output numbers may differ from this example.

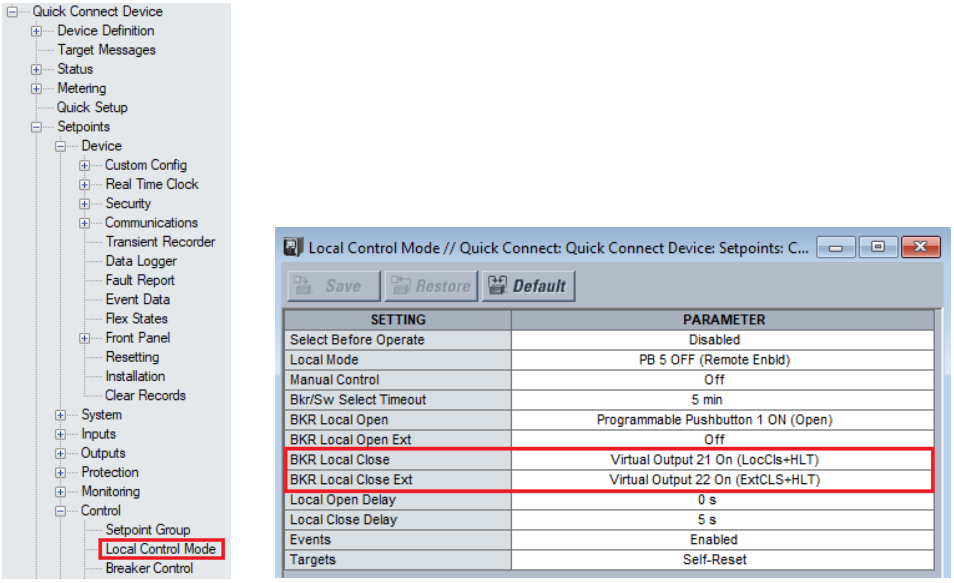


Figure 6. HLT block-close settings

Block remote control

To block remote control, use the settings in red in Figure 7.

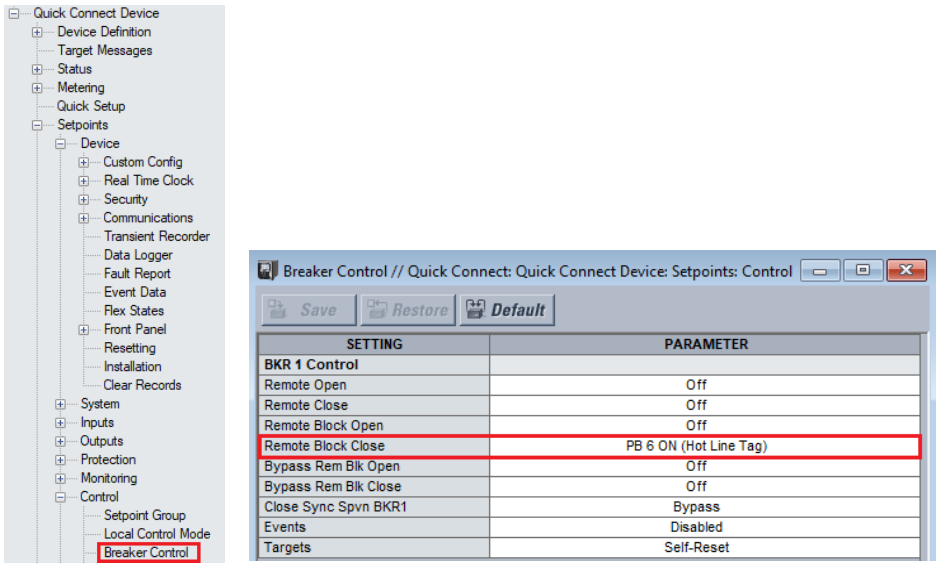


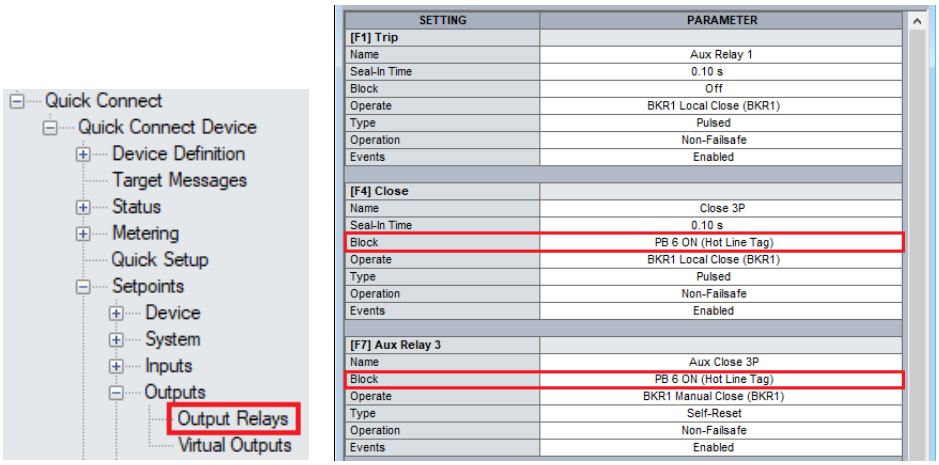
Figure 7. Remote HLT blocking

Contact blocking

As previously stated, all trip and close contacts should be mapped in the Recloser Setup settings as shown in Figure 4, (not in Outputs > Output Relays). The setting **Hot Line Tag Input** (in Control > Auto Reclose > AR Common Setup) will NOT block the outputs in the Output Relays section. The Output Relay settings are for configuration of auxiliary-relay applications only—do not use these output contacts for recloser-/switch-control outputs.

Blocking Output Relays

If output relays are used for closing operations, then HLT pushbutton PB 6 must be configured to block these output contacts. Add “PB 6 On (Hot Line Tag)” to the **Block** setting, shown in red in Figure 8, for any output contacts used to close as well as outputs to be blocked by hot-line tag (in this example, [F4] Close and [F7] Aux Relay 3).



SETTING	PARAMETER
[F1] Trip	
Name	Aux Relay 1
Seal-In Time	0.10 s
Block	Off
Operate	BKR1 Local Close (BKR1)
Type	Pulsed
Operation	Non-Failsafe
Events	Enabled
[F4] Close	
Name	Close 3P
Seal-In Time	0.10 s
Block	PB 6 ON (Hot Line Tag)
Operate	BKR1 Local Close (BKR1)
Type	Pulsed
Operation	Non-Failsafe
Events	Enabled
[F7] Aux Relay 3	
Name	Aux Close 3P
Block	PB 6 ON (Hot Line Tag)
Operate	BKR1 Manual Close (BKR1)
Type	Self-Reset
Operation	Non-Failsafe
Events	Enabled

Figure 8. Example of contact blocking for Output Relays

Instantaneous overcurrent

Use the settings in red in Figure 9 to enable an instantaneous overcurrent element that is active only when HLT is active. When hot-line tag pushbutton PB 6 is on, the block is false, allowing the IOC element to function. HLT IOC tripping is for HLT only; it is more sensitive than other IOC elements.

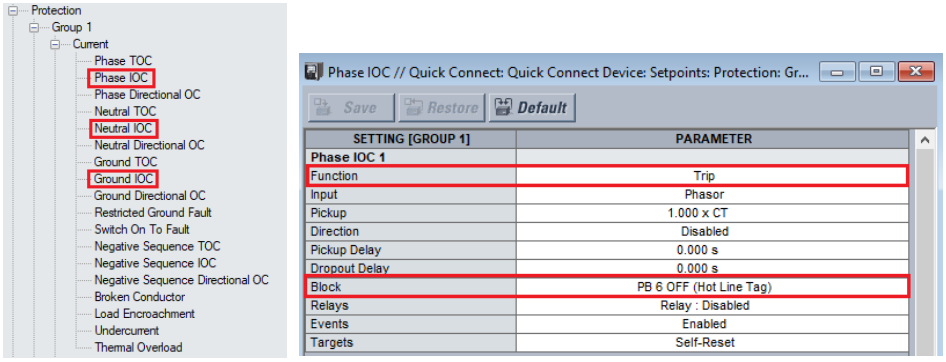


Figure 9. HLT instantaneous overcurrent enable

Summary

The application and settings listed in this document are a guide to help you design your hot-line tag scheme. If it you want to include other functionality within HLT, please contact your technical support representative. Factory technical support can be reached at 1-800-547-8629 or email, multilin.tech@ge.com.