

GTURSK RELT Switch Kit



1. **Scope:**

Combine disparate documentation around RELT switch wiring across Entelliguard and Spectra trip unit lines to create a reference document useable for all installations.

2. **Products Covered:**

Spectra MicroEntelliguard, PowerBreak II, HPCII, Entelliguard G, AK/AKR, Wavepro, PowerBreak.

3. **Overview:**

RELT is an optional trip unit feature available on all Entelliguard trip units. When available RELT provides an Instantaneous overcurrent trip protection function that operates independently from all other overcurrent protection in the trip unit.

RELT protection is intended to be activated temporarily while personnel are in close proximity to a protected circuit breaker. The RELT pickup threshold is usually set much lower than the normal overcurrent protection, in order to respond quickly to any faults and thus limiting possible arc flash energy.

4. **Engaging/Disengaging RELT protection:**

To engage RELT on breaker equipped with Entelliguard Trip Units you have two options. Option 1 is to send a command via Modbus communications. Option 2 is to provide an electrical input signal to the trip unit through an external switch. This switch can take any form – light curtain, toggle switch, relay – any switch closure applied to the correct trip unit input will engage RELT. Once engaged the trip unit will close one output relay and it will flash the LCD display to give positive indication the trip unit has engaged RELT protection settings.

MicroEntelliguard trip units have the same Modbus and Input RELT commands but they also provide a means of engaging RELT via the trip unit's keypad.

Disengaging RELT protection on Entelliguard and MicroEntelliguard is similar – all forms of RELT engage command must be turned off. This means the Modbus command must be sent to turn RELT OFF, the wired input must be opened, and the keypad setting must be changed to OFF. Once all RELT inputs are OFF the trip unit will take 20-40 seconds before it will disengage RELT. This provides time to get clear of the equipment. After the trip unit has disengaged RELT the LCD display will stop flashing.

5. How external RELT switches interact with the trip unit:

Every Entelliguard and MicroEntelliguard trip unit that has the RELT option installed will have one Digital Input and one Relay Output permanently assigned to the RELT software function.

INPUT: Inputs on Entelliguard Trip Units operate on 24VDC. When you apply 24VDC to the input terminals the trip unit will “see” this transition and engage RELT protection. The trip unit will continue to engage RELT protection for as long as the input is asserted. If all RELT commands to the trip unit are turned OFF, RELT will disengage.

OUTPUT: whenever RELT is engaged, either through communications, keypad command, or digital input, the trip unit software will turn on its output relay. ***There is never an electrical link between the Input terminals and the Output terminals.*** The trip unit electronics control the output relay based on the status of the Communications/keypad/Input command status.

The output relay can be used for annunciation that RELT is engaged. It can be used to turn on an indicator lamp, or to signal a SCADA system that RELT has been activated.

With the GTURSK illuminated toggle switch the blue indicator is controlled by the trip unit’s output relay.

6. GTURSK wiring kit:

The GTURSK wiring kit provides a pre-configured 3 position toggle switch and indicating lamp that simplifies wiring to an Entelliguard or MicroEntelliguard trip unit.

Each toggle switch assembly contains three elements:

- One Normally Open latching contact
- One Normally Open Momentary contact
- One blue LED indicating lamp

Here is a photo of the GTURSK switch assembly installed on switchgear:



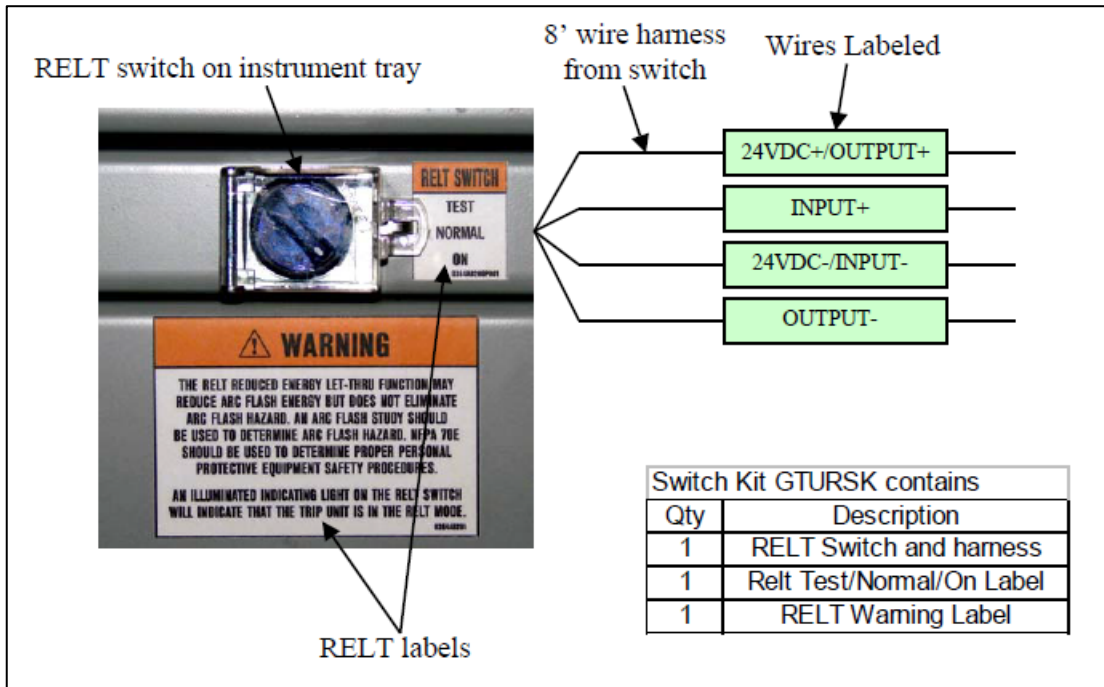
TEST Position: Momentary contact. Turns on the internal blue indicator, but does not engage RELT protection. The blue indicator is powered only through the TEST switch. It is not being powered by the trip unit output.

NORMAL Position: Latching contact. This does not engage the blue lamp or engage the RELT function. This position is used during normal system operation.

ON Position: this engages the trip unit RELT function by applying a signal to the trip unit's digital input terminals. The blue indicator will turn on if the trip unit Output is wired to energize the lamp.

7. GTURSK Wiring (General):

The GTURSK wiring kit has four wires that must be properly connected for the RELT switch to work as intended.



24VDC+/OUTPUT+ : This wire is connected to the trip unit positive terminal of the 24VDC auxiliary supply and the trip unit + Output terminal.

INPUT+ : this wire is connected to the trip unit + Input terminal

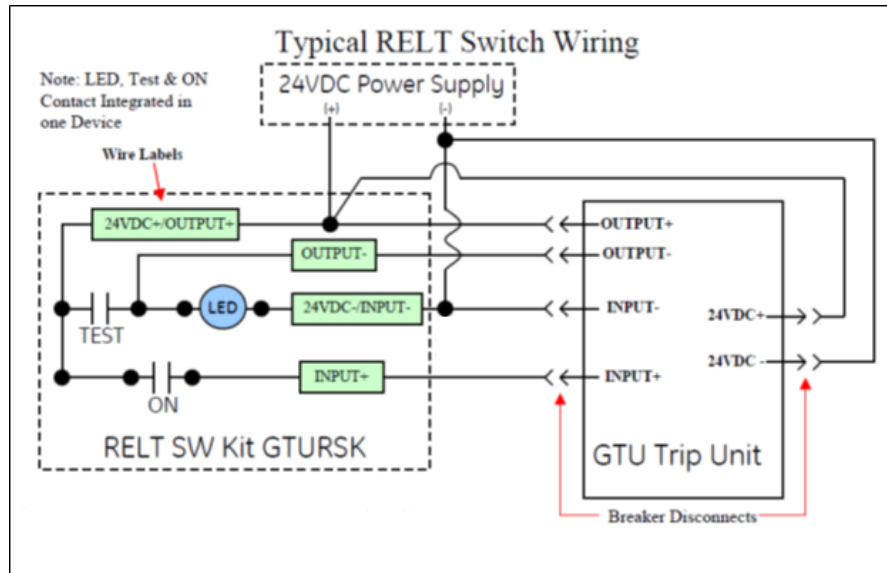
24VDC-/INPUT- : This wire is connected to the common or negative terminal of the 24VDC auxiliary supply and the trip unit's – Input Terminal

OUTPUT- : this wire is connected only to the – Output terminal on the trip unit.

The actual landing points for these four wires are different for each breaker type that uses the RELT kit

8. GTURSK Schematic (general):

Below is a schematic representation of the GTURSK wired to an Entelliguard trip unit. The specific wiring locations are found in the next section. This section is meant to provide a general explanation of the function of each element.



24VDC Power supply – typically this is the auxiliary DC power supply for the trip unit. Whatever DC source supplies the trip unit must also be used for the Input and Output signaling.

LED – this is the blue indicating lamp that is embedded in the toggle switch body.

TEST – this is the momentary contact block on the toggle switch assembly. When the GTURSK switch is held in the TEST position this contact closes. Current flows from the DC positive terminal through the TEST contact and the LED indicator, returning to the DC negative terminal.

ON – this is the contact that will engage RELT. Current flows from the positive DC terminal, through the closed ON contact, to the trip unit's positive input terminal, through the internal trip unit input circuit, returning to the negative DC terminal from the trip unit negative input terminal. The only current that flows through the ON switch is current to drive the trip unit input circuit.

When the trip unit receives the input signal it will send a command to its Output relay to close. When the trip unit output closes it connects the positive 24V terminal that is wired to the trip unit's positive output terminal

Note that in the NORMAL switch position both the ON and TEST contacts are OPEN.

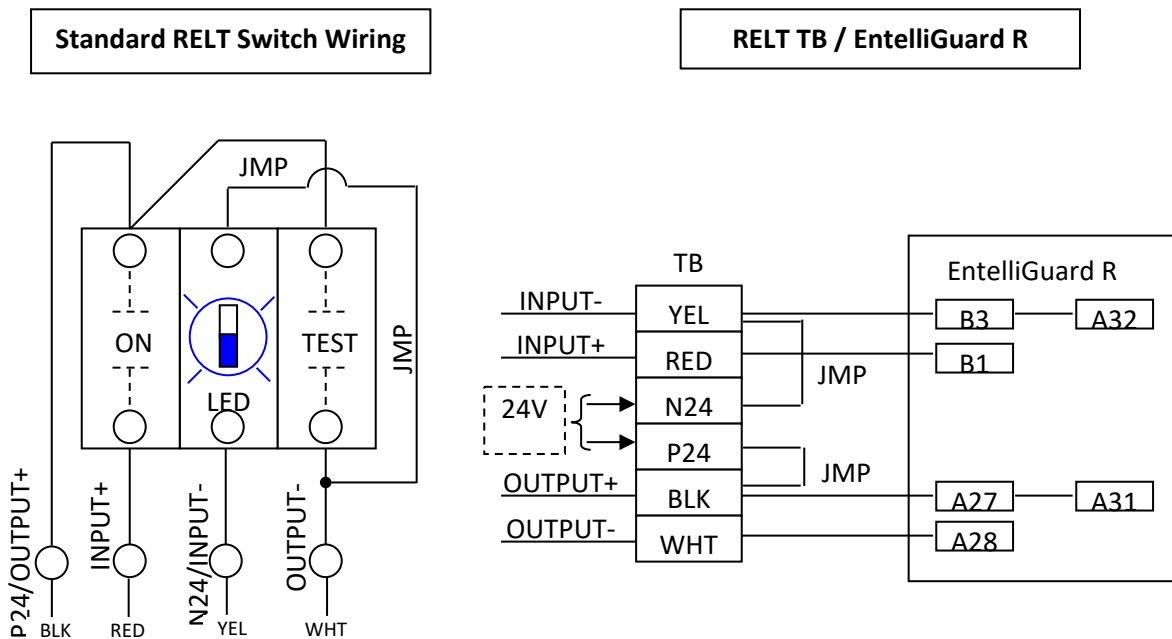
9. Breaker Specific wiring:

Breaker	GTURSK WIRING HARNESS ASSIGNMENTS					
	24VDC+/OUTPUT+		INPUT+	24VDC-/INPUT-		OUTPUT-
Entelliguard G	24VDC Positive	A27	B1	24VDC Negative	B3	A28
HPCII	24VDC Positive	Terminal 21	Terminal 28	24VDC Negative	Terminal 27	Terminal 22
PBII	24VDC Positive	Terminal 21	Terminal 28	24VDC Negative	Terminal 27	Terminal 22
Spectra SDCJBBC junction box	DC is Prewired in junction box	Junction box terminal RELT O+	Junction Box terminal RELT I+	DC is Prewired in junction box	Junction box terminal RELT I-	Junction box terminal RELT O-
Spectra SDCTBA11C terminal block	Terminal POWER (+24VDC)	Terminal RELT (O+)	Terminal RELT (I+)	Terminal POWER (- COMMON)	Terminal RELT (I-)	Terminal RELT (O-)
AK/AKR/PowerBreak with 36 pin connector	24VDC Positive/ Pin 36	Pin 27	Pin 4	24VDC Negative/ Pin 35	Pin 2	Pin 30
Wavepro with 50 pin connector	24VDC Positive Pin 14 (SD A35)	Pin 22 (SD C33)	Pin 23 (SD C35)	24VDC Negative, Pin 15 SD (A36)	Pin 40 (SD C36)	Pin 12 (SD C34)

10. Entelliguard Retrofill Specific wiring:

Wiring Connections when the **REL T FUNCTION ONLY** option is required. Can use just the standard 4 Pin RELT wire harness and add jumpers to the EntelliGuard Retrofill Breaker for the P24/N24 Voltage Power Supply Connection for the EntelliGuard GTU.

REL T Function	Wire Color
P24 / OUTPUT +	BLK
OUTPUT -	WHT
INPUT +	RED
N24 / INPUT -	YEL



The RELT Switch wires OUTPUT +/- and INPUT +/- will connect to the standard RELT 6 point terminal block that comes with the wire harness.

The unused terminals 3 & 4 will be used for the 24 Volt DC supply voltage. Jumpers were added to the block to connect the supply voltage to the INPUT- and OUTPUT+ wires.

The other end of the Wire Harness plug connects to the B1/B3 and A27/A28 terminals on the EntelliGuard R breaker. Jumpers are then added on the breaker between B3/A32 and A27/A31 to supply the EntelliGuard GTU Trip Unit with the required 24VDC supply voltage.

These instructions do not cover all details or variations in equipment nor do they provide for every possible contingency that may be met in connection with installation, operation, or maintenance. Should further information be desired or should particular problems arise that are not covered sufficiently for the purchaser's purposes, the matter should be referred to the ABB Inc.

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