



## Application Note

Substation Automation and Protection Division

### Equipment and Installation Savings by Using the Version 5.0 DPU2000R with the Enhanced Operator Control Interface

The Version 5.0 DPU2000R relay with the new enhanced Operator Control Interface (OCI) provides savings to the end user by minimizing the need to wire switches, specialty relays and indicator lights to the relay. This application note describes specifically which switches, relays and lights may be eliminated.

#### Breaker Control

With the enhanced Operator Control Interface (OCI), it is not necessary to wire in a conventional breaker control switch, as this function is now included on the DPU2000R. Two control buttons are provided for opening and closing the breaker, and built-in indicator LEDs annunciate breaker position. In a conventional design, a separate breaker control switch is usually mounted on a steel plate immediately above the relay, and may or may not have indicating lights to properly state the breaker position. Similar to the mechanical switch, the breaker control buttons on the OCI panel do not require a password in the event of an immediate operation requirement. Upon depressing either the "open" or "close" buttons, confirmation of the operation is queried and requires the F2 function key on the panel to be also depressed for the necessary operation. This action provides a degree of security in the event one of the breaker control buttons is inadvertently depressed.

#### Hot Line Tag

Available as an option on the DPU2000R enhanced OCI panel is the Hot Line Tag feature. Many industrial and utility organizations mount a separate "31TR" switch on the panel to remove a breaker from service and physically place a tag on the switch, hence the term "tagging". The inclusion of these switching and tagging functions in the DPU2000R emulates the 31TR mechanical switch which would alternately be purchased for \$600 to \$800. The Hot Line Tag switch is moved through its "ON", "OFF" and "TAG" functions by depressing the arrow key buttons, just as the separate 31TR mechanical switch is moved through its positions by the switch handle. This Hot Line Tag feature includes LEDs that indicate the status of the function. The three positions of the switch are further described below:

- "ON", which indicates that all breaker closing operations are permitted, including: automating single or multi-shot reclosing, SCADA commanded closing (over network or hard-wired to inputs) or manually initiated closing (using buttons on the front of the relay).
- "OFF", which indicates that all automatic reclosing is blocked, but manually-initiated closing using controls on the front of the relay is permitted. SCADA commanded closing may or may not be permitted depending on user preference and configuration.
- "TAG", which indicates that all closing operations are blocked: automatic, manual or SCADA. This TAG state is accomplished by the relay logic disabling the logical output "CLOSE".

#### Programmable Control Buttons

Six control buttons on the left side of the OCI are factory configured and labeled to provide:

- 1) enabling or disabling of the reclosing function, ground relaying and instantaneous relaying
- 2) local / remote selection
- 3) selection of alternate settings groups

These control buttons can also be re-configured (in WinECP) and re-labeled by the user (using ABB-provided .doc ) to enable or disable (or turn "ON" or turn "OFF") any relay function or control output.

Before the new enhanced OCI was available, customers wired separate control switches to physical inputs on the rear of the DPU2000R to force these changes in relay operation. Total costs included purchasing and mounting

switches, wiring to the relay, and configuring the relay to respond to these input signals. These devices and costs can now be eliminated.

## **Programmable Indicator Lights**

22 indicator lights for annunciation of relay targets and operational status are factory configured and labeled to provide:

- 1) Relay targets, by phase and function
- 2) State of recloser, ground relaying and instantaneous relaying (enabled and disabled)
- 3) Indication of whether control buttons have been actuated

The indicator lights can also be re-configured (in WinECP) and re-labeled by the user (using ABB-provided .doc) to annunciate any condition in the relay that can be enabled or disabled (or "ON" or "OFF")

Before the new enhanced OCI was available, customers wired separate indicator lights to physical outputs on the rear of the DPU2000R to annunciate operation status. Total costs included purchasing and mounting lights, wiring to the relay and configuring the relay to close outputs to drive the lights. These devices and costs can now be eliminated.

Please note that if the user's standard practice requires external switches, they can be used as well as the switches built in to the enhanced OCI.

## **Latching Relays**

Eight latching logical outputs are now included in the DPU2000R. Each of these can be assigned to a physical output and can be SET and RESET with logical inputs. Once the output is SET, it will remain ON until RESET.

Many previous generation relays, including earlier DPU2000R relays, required the use of separate, physical latching relays. These hard-wired latching relays can be eliminated with the latest relay firmware.

## **Summary**

Devices that can be eliminated with the latest DPU2000R with the new enhanced OCI include:

- Breaker control switches
- 31TR Hot Line Tag switches
- Selector switches
- Indicator lights
- Latching relays

With each physical device eliminated, wiring and testing costs are reduced and panel space reduced.

Please feel free to contact the Relay Division for more information on the latest DPU2000R and the new enhanced OCI, or visit our website [www.abb.com/substationautomation](http://www.abb.com/substationautomation) Select the "DPU2000R" from the drop down menu on the right labeled "Distribution products".

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Revision 0, 10/25/01

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