

REG-D & REG-DA Voltage Regulating Relays: Local/Remote & Auto/Manual modes

A.Eberle Voltage Regulating Relays allow selection between Automatic or Manual and Remote or Local modes to control the possible sources of Raise and Lower tapping commands.

Automatic and Manual modes

In Automatic mode the automatic voltage regulation functions of the relay are activated. Tapping commands are issued in response to:

- the active Time Programme and/or Parallel Programme
- the high-speed switching function
- the Parallel Programme (if a Follower in a Master-Follower scheme)

All 'manual' initiated tap commands are ignored, such as Raise, Lower buttons, binary input or SCADA commands.

Setting changes cannot be made to a relay when it is in Automatic mode.

In Manual (Hand) Mode, automatic regulation is disabled and tapping commands are only issued in response to Raise/Lower commands via:

- Raise/Lower keys on the front panel (figure 1)
- external controls wired to binary inputs assigned to the input functions 42:Up and 43:Down
- Raise/Lower commands via SCADA protocol

A.Eberle documentation interchangeably uses the terms 'Hand' and 'Manual' to describe Manual mode.

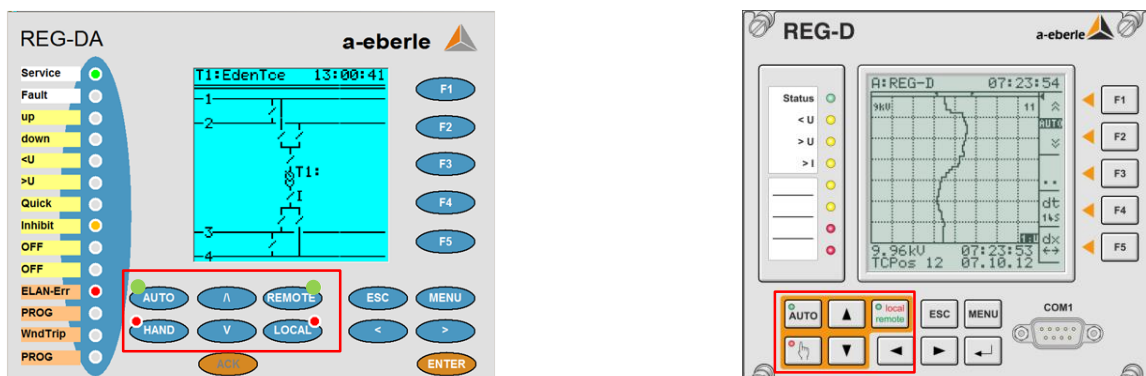


Figure 1. Front panels regulators showing Auto/Hand and Remote/Local mode selection keys as well as Raise () and Lower () pushbuttons.

Switching between Automatic and Manual mode can be via:

- front panel Auto/Hand keys (figure 1)
- SCADA control
- binary inputs assigned to binary inputs 5 & 6
- restarting of the relay

Automatic mode is indicated by the green AUTO LED being illuminated, while Manual mode is indicated by the Red 'Hand' LED being illuminated.

If a relay is operating in a Master-Follower parallel scheme then switching between Automatic and Manual modes can only be done via the relay acting as the Master. Switching from Automatic to Manual mode can be via any relay of the parallel group. Switching can also take place in response to changes on the Master relay due to parallel or tap errors. This behaviour depends on the configuration options selected. Refer to the document on the Master-Follower scheme for details.

With the default settings a relay will always switch to Manual mode when it is restarted. This can be modified with the parameter *Hand auto remains unchanged after reset*. If this is selected then the relay will resume the mode that was active prior to the restart.

Switching between Manual and Auto modes via binary inputs

Binary inputs 5 & 6 are usually designated as fixed functions to control the selection of Automatic/Manual mode. The function can be configured via parameter *Manual (H)/Automatic*. The available settings are:

- 00:E5-A/E6-H. With this setting when binary input 5 is active, Automatic mode will be selected. When binary input 6 is active, Manual (Hand) mode will be selected.
- 00:E5-PULSE. The relay toggles between Automatic and Manual modes when Binary input 5 is pulsed. Binary input 6 has no function with this setting.
- 02:E05+6-PROG. Inputs 5 and 6 no longer are no longer directly assigned to switching between Automatic and Manual modes but are instead available for use in a background programmeme.

Local and Remote modes

Local and Remote front panel push buttons are standard on the REG-DA. Remote mode is indicated by the green 'Remote' LED being illuminated, and Local mode is indicated by the red 'Local' LED being illuminated.

For the REG-D, the front panel Local/Remote button is an order option with a single button with toggle function and dual-colour LED being provided. Local status is indicated by the LED illuminating RED. Remote mode is indicated by the LED illuminating GREEN (the LED colours match the colour of the appropriate Local/Remote button text). If the REG-D is ordered without the front panel Local/Remote button, the function can still be implemented via SCADA or Binary inputs. The Local/Remote button function can also be disabled, effectively allowing both Local and Remote functions to operate.

Remote mode

In Remote mode, manual Raise/Lower commands or Automatic/Manual selection can be via:

- SCADA interface
- Binary inputs assigned to the Raise, Lower or Automatic/Manual input functions

Front-panel Raise, Lower, Automatic and Manual key switches are disabled.

Local mode

In Local mode, manual Raise/Lower commands or Auto/Manual selection are only permitted via the relay front panel keys. Controls via binary input or SCADA are disabled.

Outputs:

Fixed LEDs on the front panel indicate Automatic/Manual and the Local/Remote status. The same status signals are available for mapping to the log file and can be mapped to binary outputs and other LEDs via the following output functions.

Signal	Output Relay Function	LED Function
Auto mode is active	40:AUTO	
Remote mode is active		43:Local
Local mode is active		44:Remote

Table 1. Output Relay and LED Functions.

Customisation options

It is possible to switch control of regulation modes via a background programme. One common application of this is to have an external isolation switch located in the tap-changer compartment. A contact from the isolation switch is wired to a programmable input of the relay. A background programme inhibits **all** tapping commands from the relay when this input is active (all Manual and Automatic tap commands are inhibited).

Use of External REG L/R switch

Hardwired manual control and mode selection can also be performed via an external A.Eberle REG L/R unit. Binary input functions 53:LR_A, 54:LR_STAT, 63:LR_LR are available for use with this function. Refer to the REG L/R data sheet or contact HV Power for more details on the use of this unit.

More Information:

For further information on transformer control with A.Eberle Voltage Regulating Relays refer to <http://www.hvpower.co.nz/TechnicalLibrary/VoltageRegulators.html> or contact HV Power.