# Local/Remote-Interface Type REG-LR with REG-D(A)

The Remote/Local Interface REG-LR connects the step UP/DOWN signal from severe sources to the transformer tap changer switch. A 3-position switch at front side of REG-LR selects either the stepUP/stepDOWN signal from the remote inputs, from the REG-D (AUTO) or from the local switch below.

In position remote it depends of input Hand/Auto from witch UP/ DOWN inputs the tap changer will be controlled. 3-position switch' AUTO' will allways connect UP/ DOWN pulses from REG-D transfers unchanged to tap changer switch. In switch position 'local' the second frontside switch ↑ ↓ gives the direction to tap changer. UP/DOWN signals from remote inputs or switch ↑ ↓ were converted to electrical pulses with adjustable ON-time.

Relais dry contacts (NO) show the signals stepUP, stepDOWN, the mode (like HAND/AUTO, Local/Remote) and o.k. status of REG-LR usable for return message to REG-D or remote unit.

A front side LED shows the o.k. status of REG-LR and darkens while remote inputs $UP_{Rem}$/ $DOWN_{REM}$ or signals from switch ↑ ↓ ; signals from REG-D will not displayed. Inputs and outputs and switches were blocked against each other for noise cancelling.

- ⊕ local Trafo stepping UP/DOWN with removed REG-D
- ⊕ 3-position switch with turn knob or key locked
- ⊕ Large auxiliary voltage range of the power supply

## Technical specifications

### Regulations and standards

IEC1010, IEC801-1 to6; VDE0110, VDE0160
Interference immunity EN50082-2
Emitted interference EN50081-2, EN5501 1

### Mechanical data

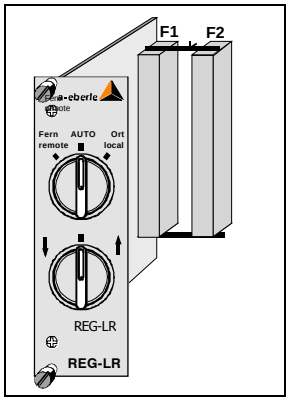
Design 19" plug-in modules (8T, 3H)
Circuit board /Front 100 x 160mm / RAL 7035 grey
Configuration according to DIN 41494 Part 5
Plug-in connector 2 units, 'F1': DIN 41612 MH 24+7pole
'F2': high current 4-pole
19" mounting 'F1' at Positions 'n' and 'F2' plus 3T
Degree of protect. IP00 / weight Plug-in modules ~0.6kg

### Input

remote inputs UP,DOWNRem, HAND/AUTORemote, HANDRemote
input voltage Ue DC/AC 50..400Hz sin., square wave 1:1
H-Level (1) 50 ..250 V, inp.resistance 120kOhm (E3)
12 ..60 V, inp.resist. 33kOhm(Feat.E2)
L-Level (0) < 5 V
Isolation voltage. AC 250 V between inputs (E3)
Contact load AC 230V 2A, DC 220V 50W

### Output

voltage U+ to Binary Inputs BE of REG-D
BE 50V ON(1) > 10V DC; load >10kOhm
BE 250V ON(1) > 38V DC; load >47kOhm
OFF(0) < 5V DC
4 Relays with NO (normally open) contacts for signals
stepUP,DOWN,HAND/AUTO, local/Remote
2 Relays for $UP_{AUTO}$/$DOWN_{AUTO}$ output
Feature U2/U1: NC / NO contacts
Contact load AC 250V 2A DC 220V 150W
Number of switching operations $< 10^5$




### Transfer behaviour

Remote input Hand/Auto by 2 or 1 control wires, select by 3pole socket on PCB plug to border/middle: 1/2wire
pulse with positive edge and 'ON-time >0.5 sec
Output pulses stepUP/DOWN generated from remote input UP/$D_{REM}$ or switch ↑ ↓
$t_{UP}$, $t_{DOWN}$ time adjustable 1 . .5 sec; default: 2sec
iddle time between pulses: $t_{UP}$,$t_{DOWN}$ +1,5sec

Feature '**V4**: remoteUP/DOWN is 'or wired' with UP/DOWN from REG-D
pulse ON-time for UP/DOWN from remote / switch ↑ ↓

Two current contacts in connector F2 feed UP/DOWN signal from REG-D unchanged thru REG-LR, even with unplugged REG-LR.
So simply it could be removed in case of malfuction.
Feature **U2**: without power supply the UP/DOWN signals from REG-D will be switched to tap changer switch
A separate output signals the 'o.k.status of REG-LR.

### Safety

Safety class / Overvoltage category I / II
Degree of pollution / Test voltage 2 / 2.3kV AC
Test voltage circuits
Output voltage U+ to supply voltage,
to relay contacts, to auxiliary voltage
Supply voltage to auxiliary voltage, to relay contacts
Auxiliary voltage to relay contacts

### Power supply

Galv. separated Feature H1 AC 85..240V /DC100..264V
Feature H2 AC 20.. 60 V / DC 18..72 V
Power consumption < 6 VA / 6W H1; 1A/T H2; 2A/T

**Temperature** of Operation 0 ... +65°C
Storage, transportation -25 ... +85°C

**Code Table** Feature '**V1** (V4)

| 3-pos switch ↑ ↓ | Eingang Fern Hand/Auto | H | T | REG-D H | T | Ausgang O/F | H/A | H | T |
|---|---|---|---|---|---|---|---|---|---|
| **remo** x x | **Hand** (0) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (left) x x | Feat.'V4: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| x x | remote or | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| x x | AUTO->Out. | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| x x | V4: attention ! | 0 | 1 | 1 | 0 | 0 | 0 | **1** | **1** |
| x x | **AUTO** | x | x | 0 | 0 | 0 | 1 | 0 | 0 |
| x x | (1) | x | x | 0 | 1 | 0 | 1 | 0 | 1 |
| x x | | x | x | 1 | 0 | 0 | 1 | 1 | 0 |
| x x | | x | x | 1 | 1 | 0 | 1 | 1 | 1 |
| **AUTO** x x | | x | x | 0 | 0 | 1 | 1 | 0 | 0 |
| (mi.) x x | | x | x | 0 | 1 | 1 | 1 | 0 | 1 |
| x x | | x | x | 1 | 0 | 1 | 1 | 1 | 0 |
| x x | | x | x | **1** | **1** | 1 | 1 | **1** | **1** |
| | 'U2: no Uh | x | x | **a** | **b** | 0 | 0 | **a** | **b** |
| **local** 0 0 | (x) | x | x | x | x | 1 | 0 | 0 | 0 |
| (right) 0 1 | | x | x | x | x | 1 | 0 | 0 | 1 |
| 1 0 | | x | x | x | x | 1 | 0 | 1 | 0 |

**x** = independ; Outputs: local (1) /remote (0); Auto (1)/ Hand (0); ( AUTO: UP/DOWN inputs switched to UP/DOWN outputs)

# Technical Data REG-LR V1,V4

### Contact Position

| connector 'F1' "MH" 24+7p. | z | b | d |
|---|---|---|---|
| 2 | Rel.1 Loc/Rem | Rel.1 common | Rel.1 H/A |
| 4 | Rel.2 UP | | Rel.2 common |
| 6 | Rel.2 DOWN | | |
| 8 | input $UP_{REM}$ | | inp. $Hand_{REM}$ |
| 10 | inp.$DOWN_{REM}$ | | |
| 12 | input $H/A_{REM}$ | | input common |
| 14 | Outp. Loc/Rem | Output H/A | Outp.Status |
| 16 | | GND | |
| 20 | GND | | |
| 24 | $UP_{AUTO}$ from REG-D (with Feat. 'F1only) | | |
| 26 | $DOWN_{AUTO}$ from REG-D (with Feat. 'F1 only) | | |
| 28 | Power Supply AC/DC L / + | | |
| 30 | Power Supply AC/DC N / - | | |
| 32 | PE Protective Earth | | |

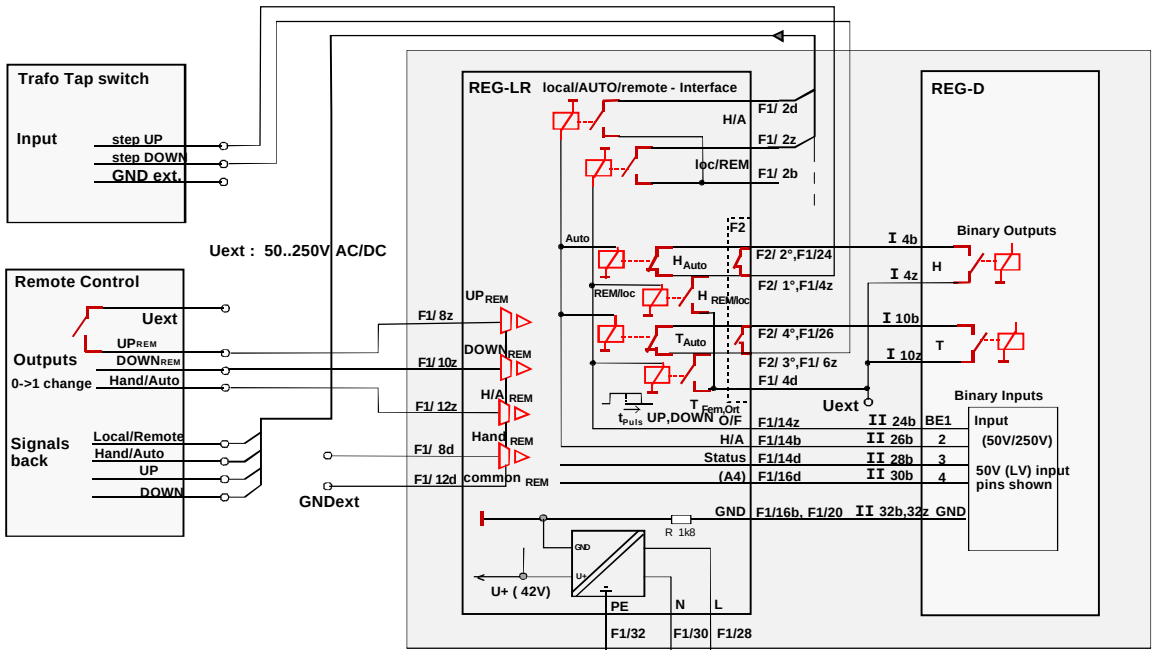
| connector 'F2' 6 poles | | | |
|---|---|---|---|
| 1 | UP | Relay 2 UP Output . | |
| 2 | $UP_{AUTO}$ | Input $UP_{AUTO}$ from REG-D | |
| 3 | DOWN | Relay 2 DOWN Output . | |
| 4 | $DOWN_{AUTO}$ | Input $DOWN_{AUTO}$ from REG-D | |

**H/A** Hand/ Automatik (same as REG-D)
**O/F** Ort/Fern or Local/Remote
**Status** REG-LR unit defect / works fine
**U+, GND (LV,HV)** Voltage output 15VDC; load <50mA, short circuit protect
Low Voltage DC/AC 10..50V, High Voltage ~50..250V
REG-LR Outputs F1/ 14 ..22 are usable for Bin.Inp. (LV) or Bin.Inp. (HV) of REG-D(A)..

| **Feature** | **code** | | |
|---|---|---|---|
| **Local / Remote - Interface REG-LR** 8T 3U 19" rack | **REG-LR B1** | | |
| **power supply** insulated AC 85..240 V / DC 100 ..264 V | **H1** | | |
| ./. AC 20... 60 V / DC 18 .. 72 V . | **H2** | | |
| **Input Voltage** Remote (H/A, Hand, UP, DOWN) AC/DC 12 ..50V | **E2** | | |
| AC/DC 50... 250V | **E3** | | |
| **Relais** $_{AUTO}$ with 2 NC-/NO contacts: $UP/DOWN_{AUTO}$ REG-D -> F2 | **U2 / U1** | | |
| **inputs** Remote inputs active: $H/A_{REM;}$ $Hand_{REM;}$ $UP_{FREM;}$ $DN_{REM}$ | **V1** | | |
| ./: same as 'V1; but switch in positiont remote & input remote with signal Hand: $UP/DN_{REM}$ 'wired or' with $UP/DN_{AUTO}$ | **V4** | | |
| **3-position switch** remote/AUTO/local switch standard | **M1** | | |
| key switch | **M2** | | |

### Application REG-LR (V1)

Feature
H1 Power Supply AC 230 V
E3 Remote Input Voltage AC/DC 50..250V
V1 4 Remote Inputs are usable
U2 Relais AUTO have 2 NC contacts: without power $UP/DOWN_{AUTO}$ from REG-D(A) are switched thru to UP/DOWN to Trafo Tap switch





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