Current monitoring module for HD series solid state relays

Current monitoring HD D0340I

- **Control voltage range: 4 ... 30 VDC**
- **Load current range: 2 A ... 40 A**
- **Permanent current monitoring**
- **Teach-in function with key or external digital input**
- **Alarm threshold: 0,84*Iteach (-16%)**
- **No-load monitoring**
- **Power failure monitoring**
- **Partial no-load monitoring**
- **Solid state relay short circuit monitoring**
- **Leakage current monitoring**
- **Straightforward installation on existing relay**

Product description:

The HD D0340I current monitoring module is a supplement to the HD solid state series, and permits monitoring and diagnosis of one or more loads (maximum five loads).

It makes it possible to detect power failure, temporary or permanent no-load as well as a short circuit of the relay.

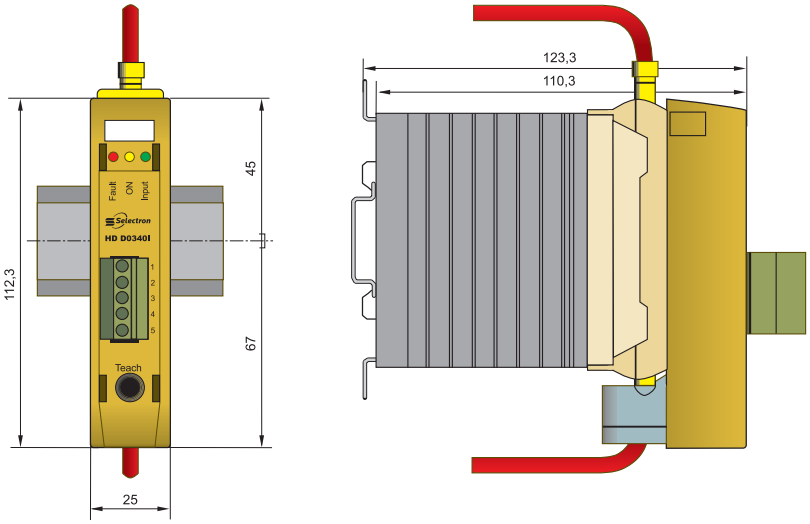
The module uses a current converter permanently to measure the load current, and compares this with the nominal value.

The nominal value can be set either using the Teach key on the front of the module or an external digital Teach input (see setting sequence diagram).

A current -16% lower than the nominal value (0.84 x nominal value) indicates that there is a temporary no-load condition.

If the module detects a fault, the diagnostic output is activated and the fault type is displayed by the 3 LEDs on the front panel. These LEDs also display all other statuses.

Dimensions of HD series relay with the current monitoring



Current monitoring module for HD series solid state relays

Current monitoring HD D0340I

Wiring diagram

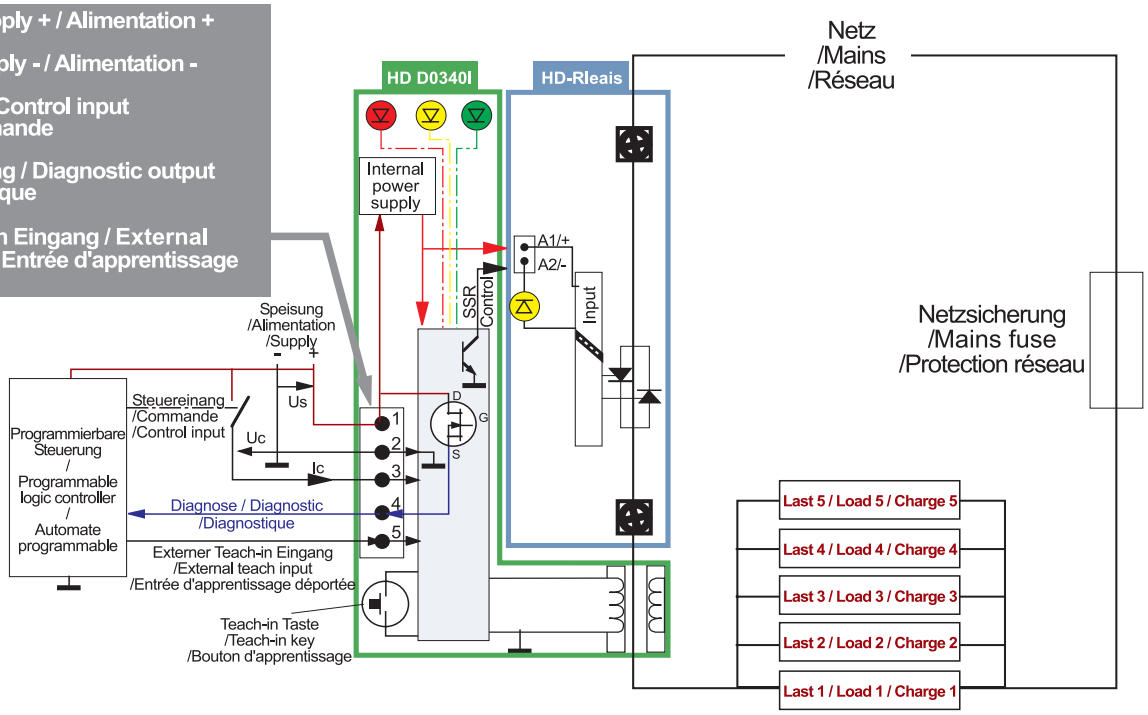
1: Speisung + / Supply + / Alimentation +

2: Speisung - / Supply - / Alimentation -

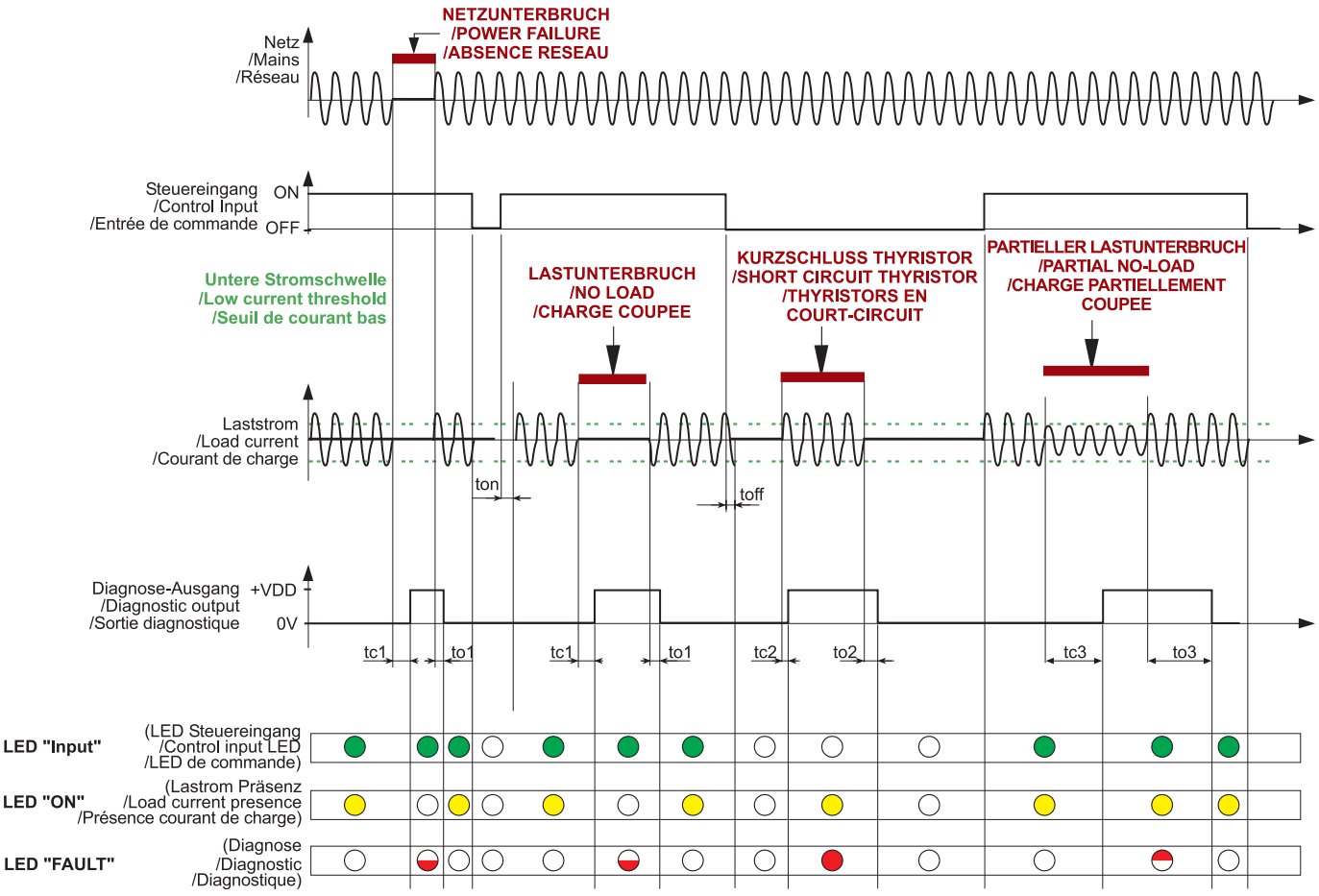
3. Steuereingang / Control input /Entrée de commande

4: Diagnoseausgang / Diagnostic output /Sortie Diagnostique

5: Externer Teach-in Eingang / External teach-in input / Entrée d'apprentissage déportée



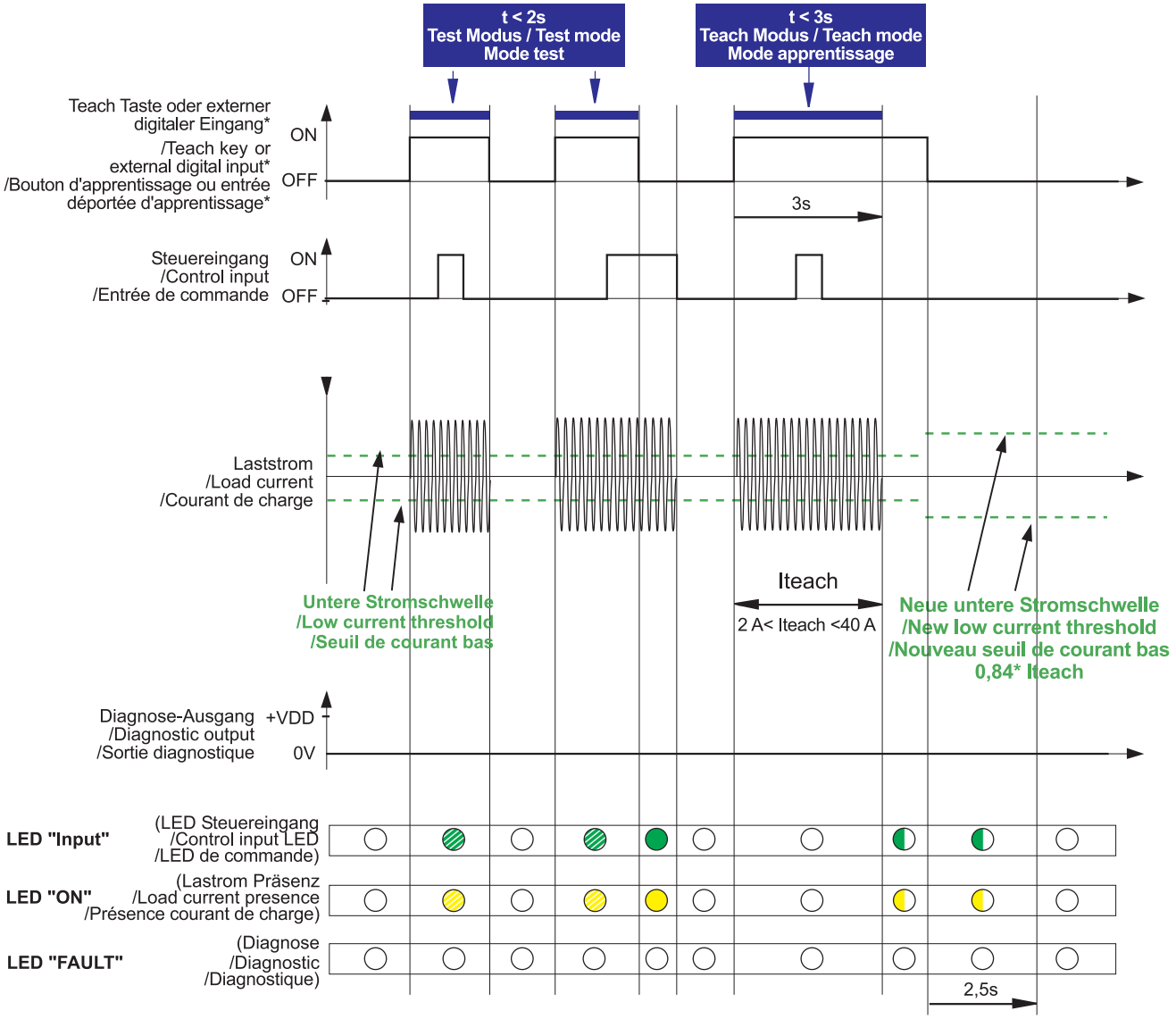
Functional digaram



Current monitoring module for HD series solid state relays

Current monitoring HD D0340I

Teaching mode diagram



Legende / Legend / Légende		
○	OFF	
●	ON grün/green/vert	
●	ON gelb/yellow/jaune	
●	ON rot/red/rouge	
◒	OFF blinkend/flashing /clignotant	langsam symmetrisch blinkend /slow symmetrical flashing /clignotement symétrique lent (Ton=1s Toff=1s)
◒	OFF blinkend/flashing /clignotant	schnell symmetrisch blinkend /fast symmetrical flashing /clignotement symétrique rapide (Ton=100ms Toff=100ms)
◒ ◒	OFF blinkend/flashing /clignotant	schnell simultan blinkend /fast simultaneous flashing /clignotement simulté rapide (Ton=100ms Toff=100ms)
◒ ◒	OFF blinkend/flashing /clignotant	langsam simultan blinkend /slow simultaneous flashing /clignotement simulté lent (Ton=1s Toff=1s)

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Setting sequence

Brief activation (< 2 s) of the Teach key or the external digital Teach input makes it possible to test the system (relay and load), in which case the control input of the solid state relay is activated.

Longer activation (> 3 s) of the Teach key or the external digital Teach input makes it possible to record and store the load current of the „Iteach“ load (teach mode).

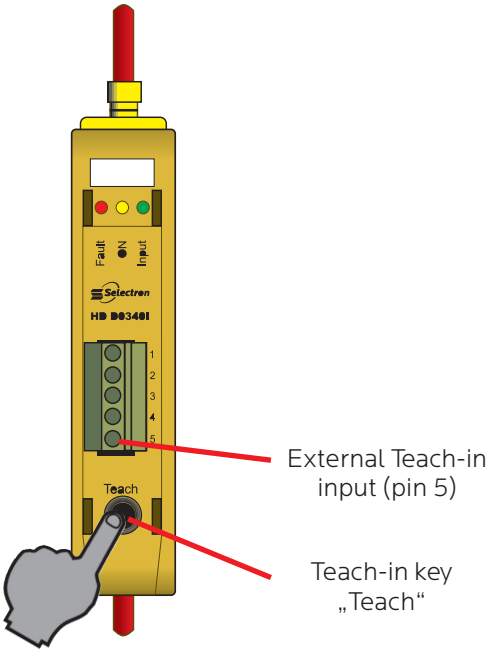
Teach mode must be carried out at a constant load current.

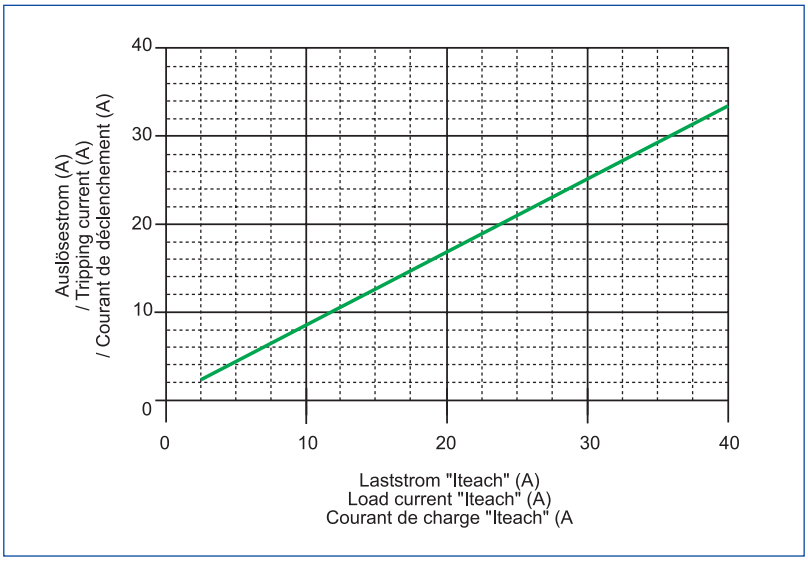
Following activation of the Teach key or the external digital Teach input, the green „INPUT“ LED and the yellow „ON“ LED flash quickly simultaneously (t_{on} = 100 ms) and (t_{off} = 100 ms). If the Teach key is pressed for longer or the digital Teach input is applied for longer (> 3 s) then the two LEDs flash slowly (t_{on} = 1 s) and (t_{off} = 1 s) to indicate that teach mode (Iteach) is active.

When the Teach key is released or the external digital Teach input is switched off, the two LEDs continue to flash for another 2.5 s as an indication that the new nominal value has been stored.

If this new nominal value is outside the monitoring range of 2 A...40 A_{rms} then the two LEDs flash alternately green and yellow as an indication that diagnosis is not possible.

The LEDs flash until the teach process is restarted.





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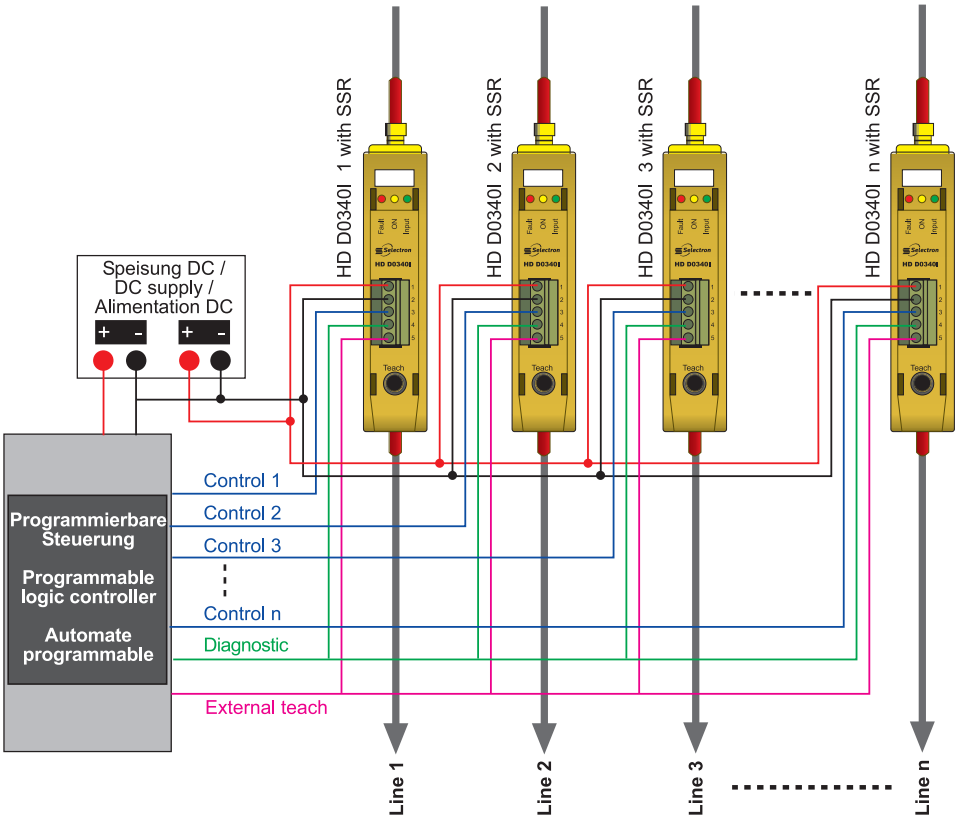
Current monitoring HD D0340I



Example of wiring with several modules

The diagnostic outputs of several modules (max. 5) can be connected in parallel to one input of a controller.

In the event of a fault, the controller detects a fault and the „Fault“ LED makes it possible to identify the fault type and fault location on the modules.

Technical data of input (at 25°C)	HD D0340I
Control voltage range	4 ... 30 VDC
Control current	0,3 ... 2,5 mA
Release voltage	2 V
Load current range at $T_{ambient}$ >0°C	2...40 A
Load current range at $T_{ambient}$ <0°C	4 ... 40 A
Load circuit frequency range	15 ... 200 Hz
Input LED	green
Voltage range of the external digital input	4 ... 30 VDC
Control current of the external digital input	0,3 ... 2,5mA
External digital release voltage	2V
Max. reverse voltage	30V
Input immunity: EN61000-4-4	1kV
Input immunity: EN61000-4-5	1kV

Current monitoring module for solid state relays type HD

Current monitoring module HD D0340I

Technical data of power supply (at 25°C)	HD D0340I
Voltage range	8 ... 30 VDC
Control current	<20 mA
Polarity reversal protection	yes
Surge voltage protection	Varistor

Technical data in general (at 25°C)	HD D0340I
Switch-on time @ 50Hz (t_{on})	15 ms
Switch-off time @ 50Hz (t_{off})	15 ms
Diameter of cable entry for current converter	9 mm
Index of protection CEI520	IP20
Vibration (10 ... 55Hz acc. to IEC 60068-2-6)	2 gn
Schock (1/2 sinusoidal/11 ms acc. to IEC 60068-2-27)	15 gn
Operating temperature range	-40 ... +80°C
Storage temperature range	-40 ... +125°C
Relative humidity	40 ... 85%
Weight	75 g
Compliance with	EN60947-4-3 (IEC947-4-3)
Compliance with	EN60950 / UL/cUL
Housing material	PA 6 UL94V0

Technical data of diagnostic output (at 25°C)	HD D0340I
Voltage range	8 ... 30 VDC
Output current	0,1 A
Output resistance closed	0,2 Ω
Max. leakage current	0,3 A
Switch-on time on power failure or no-load	tc1 40 ms
Switch-off time on power failure or no-load	to1 10 ms
Switch-on time on relay short circuit	tc2 10 ms
Switch-off time on relay short circuit	to2 40 ms
Switch-on time on temporary no-load or overload	tc3 100 ms
Switch-off time on temporary no-load or overload	to3 100 ms
Max. start-up time for load current ts	200 ms

Generalities	HD D0340I
Article number	42310270
Order data see chapter 1)	

Compliant with EN60947-4-3 (IEC947-4-3) and EN60950/VDE0805 (Reinforced Insulation) -UL-cUL pending