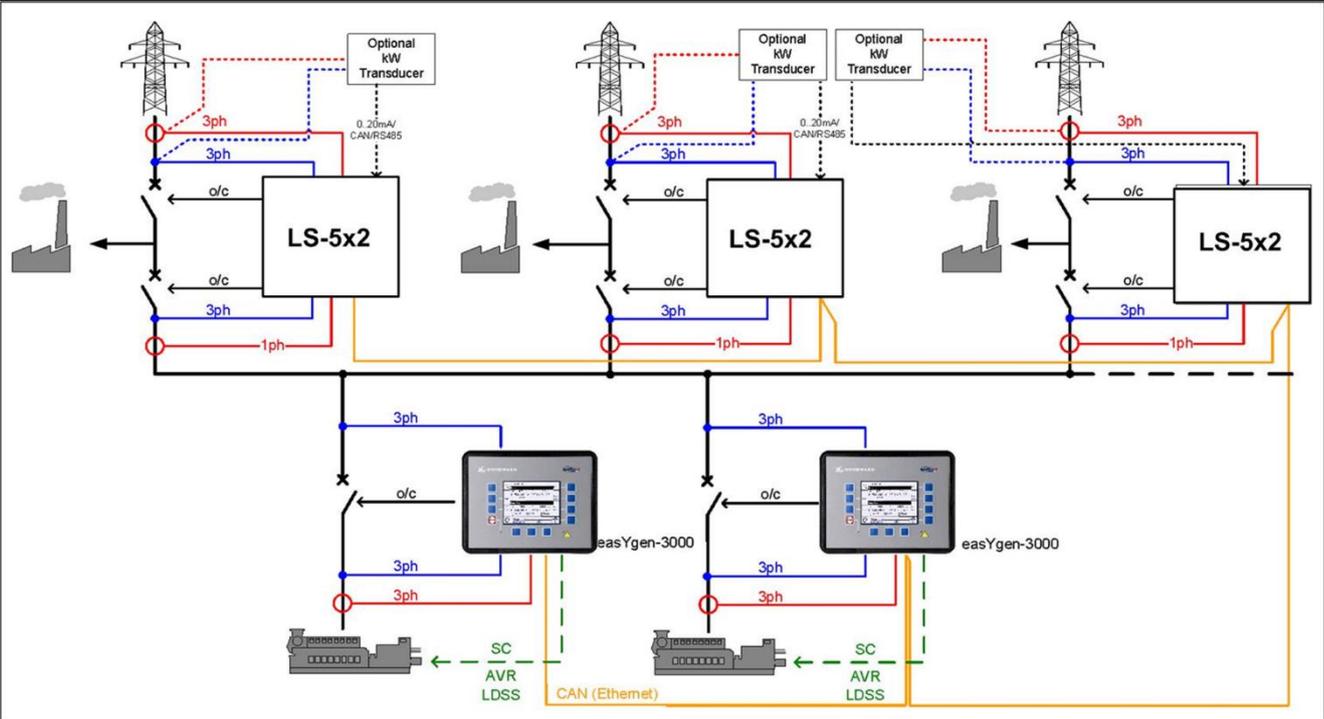
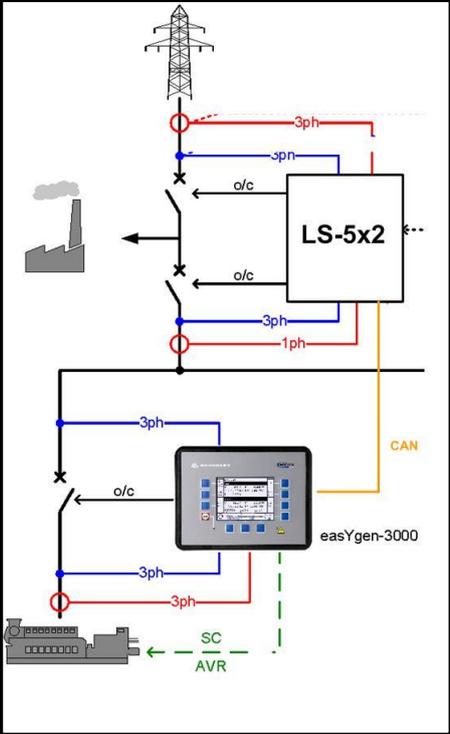


**LS-5 v2 Circuit Breaker Control
with 1breaker or 2breakers**

What's NEW?

Optional Supplementary Information

Applications



Terminal Diagram

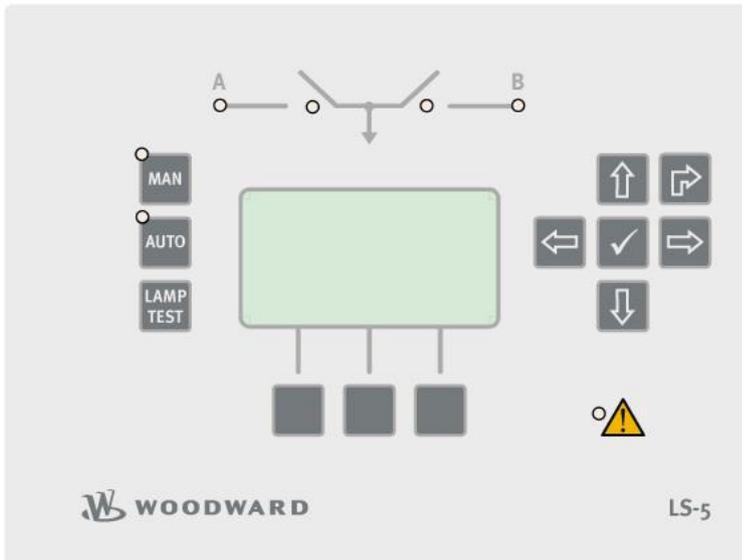
			Service port <i>ToolKit</i>			
29	480V _{AC}	System B voltage N		Relay [R1] (isolated)		30
28	120V _{AC}			- Fixed to Ready for operation <i>LogicsManager</i>		31
27	480V _{AC}	System B voltage L3		Relay [R2] (isolated)		32
26	120V _{AC}			- Default: Alarm Horn <i>LogicsManager</i>		33
25	480V _{AC}	System B voltage L2		Relay [R3] (isolated)		34
24	120V _{AC}			- Open CB B or <i>LogicsManager</i>		35
23	480V _{AC}	System B voltage L1		Relay [R4] (isolated)		36
22	120V _{AC}			- Fixed to Close CB B		37
21	480V _{AC}	System A voltage N		Relay [R5] (isolated)		38
20	120V _{AC}			- Fixed to Open CB A		39
19	480V _{AC}	System A voltage L3		Relay [R6] (isolated)		40
18	120V _{AC}			- Close CB A or <i>LogicsManager</i>		41
17	480V _{AC}	System A voltage L2	Common (terminals 44-51)			42
16	120V _{AC}					43
15	480V _{AC}	System A voltage L1	Discrete input 1	DI 01		44
14	120V _{AC}		Default: Lock monitoring			45
13	No connection		Discrete input 2	DI 02		46
12			Default: Remote Acknowledge			47
11	+ [AI 01]	Analog Input 0/4 to 20 mA (External active power System A or B)	Discrete input 3	DI 03		48
10	⊥		Default: Open CB B			49
9	S ₁ ●	System B current (isolated)	Discrete input 4	DI 04		50
8	S ₂		Default: Enable to Close CB B			51
7			Discrete input 5	DI 05		52
6	S ₁ ●	System A current (isolated)	Fixed: Reply „CB B is open“			53
5	S ₂ L3		Discrete input 6	DI 06		54
4	S ₁ ●	System A current (isolated)	Default: Open CB A			55
3	S ₂ L2		Discrete input 7	DI 07		56
2	S ₁ ●	System A current (isolated)	Default: Enable to Close CB A			57
1	S ₂ L1		Discrete input 8	DI 08		58
			Power supply		12/24 V _{DC}	59
			8 to 40 V _{DC}		0 V _{DC}	60
			Function Earth (Display version only)			61
			CAN bus (isolated)		CAN-L	62
					CAN-H	63
			RS-485 interface (isolated)		RS-485-b	64
					RS-485-a	65

LS-5X2

Hardware

Housing

- Dimensions of the control remain the same as v1
- Additional second breaker indication

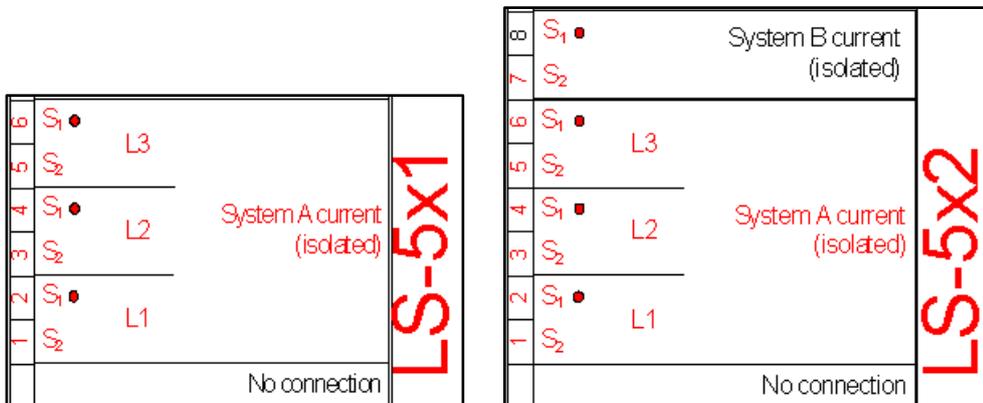


Part Numbers LS-5 v2

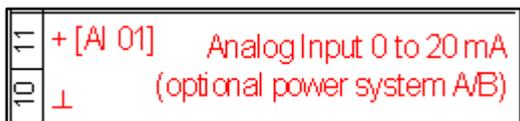
Device Type	5 Ampere	1 Ampere
LS-521 one breaker control with display	8440-2150	8440-2178
LS-522 two breakers control with display	8440-2151	8440-2179
LS-511 one breaker control without display, metal housing	8440-2152	8440-2180
LS-512 two breakers control without display, metal housing	8440-2153	8440-2181

Terminals

- Changed CT connection (6 PIN connection without common terminal)



- Analog input 0/4-20 mA for external power measurement System A or System B (LS-5x2)



Functionality

Application

Breaker mode CBA/CBB

- Application mode “Single”:
Application mode without easYgen-3500 or multiple LS-5 connection
- Application mode “LS5”:
Multiple LS-5 mode in combination with easYgen-3500 and other LS-5
- Application mode “L-GGBMCB”:
Preselected mode in combination with easYgen-3500XT (v1.13)
This mode is similar to the application mode “GCB/L-GGB/L-MCB” but with one LS-5x2 instead of two LS-5x1.

Breaker mode CBA

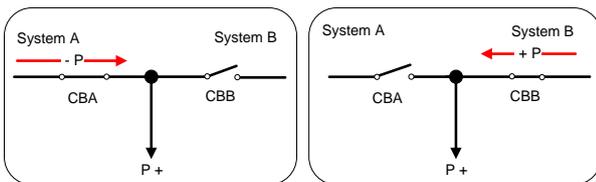
Same functionality like the predecessor LS-5x1 (one-breaker version 1).

Measurement

- Power calculation for System B



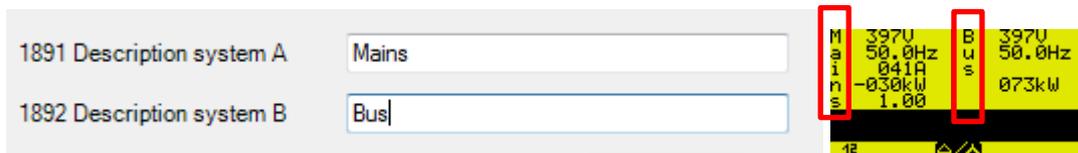
- Load calculation, active power summation from System A and System B in relation to the breaker replies.



- External active power measurement with 0/4-20 mA input for system A or system B

HMI

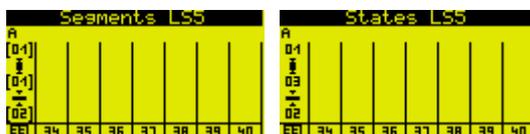
- Homepage description for system A and B configurable



- Load visualization



- LS-5 segment and states visualization



- BDEW and VDE 4105 (grid code requirements)
 - Mains decoupling test mode
 - Breaker decoupling test



Monitoring

- Operating Range Monitoring:
The different cases for operating range failures are displayed with an Error Code 01 – 06 (“Oper. range 1”, ...).
The Technical Manual explains in detail what is wrong.
 - Operating range 1 (CAN consideration, application mode “LS5”)
 - Operating range 2 (Connect synchronous mains/networks)
 - Operating range 3 (CBA dead bus closure)
 - Operating range 4 (CBA synchronization)
 - Operating range 5 (CBB dead bus closure)
 - Operating range 6 (CBB synchronization)

- Voltage plausibility:
With the closed breaker replies, there is a plausibility check between the system A and B voltage.

- Free alarms:
The four free alarms can be triggered with the internal flags 1-16.

- Change of frequency (System A):
Phase shift monitoring and df/dt (ROCOF) can both enabled.

- System A decoupling (LS-5x2):
Enhanced decoupling possibilities
 - CBA
 - CBA → CBB (after configurable delay time)
 - CBB
 - CBB → CBA (after configurable delay time)
 - CBA or CBB selected by LogicsManager

Alarm Classes (LS-5x2)

- The alarm classes distinguish “Breaker Open” between CBA and CBB

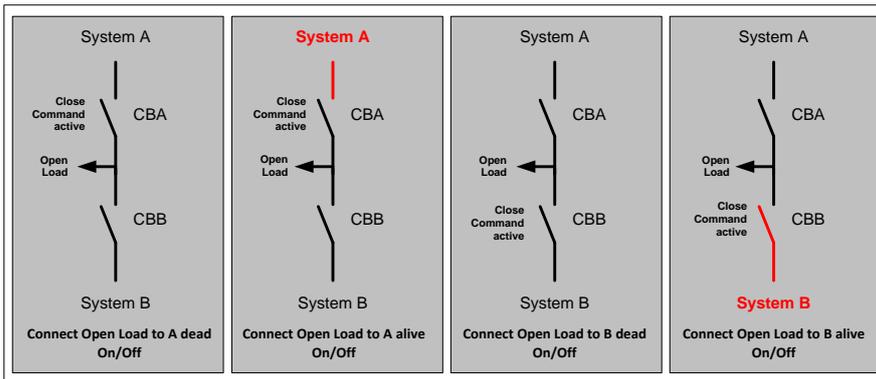
Counters

- System A energy counters:
The system A has four energy counters
 - Positive active power (+MWh)
 - Negative active power (-MWh)
 - Positive reactive power (+Mvarh)
 - Negative reactive power (-Mvarh)

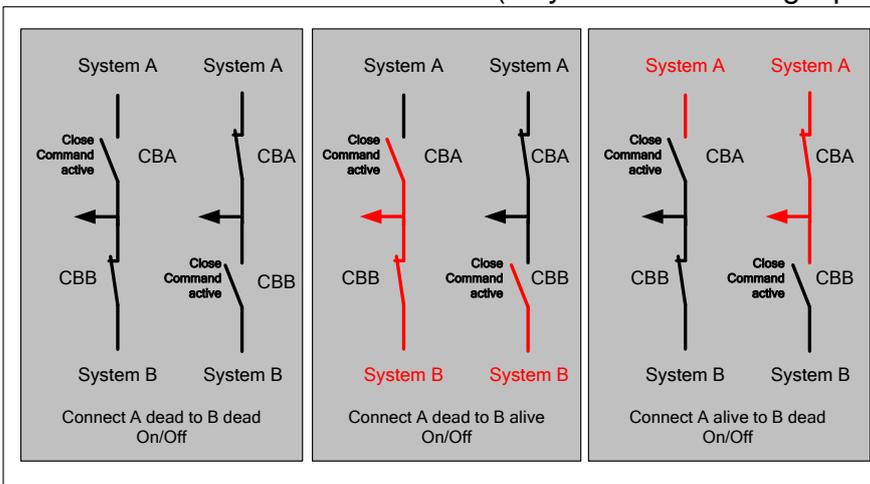
- CBB close counter

Breaker Operation

- Breaker transition modes:
 - Switch load with open transition
 - Switch load with closed transition (short parallel <100 ms)
 - Switch load with interchange (ramping, loading, and unloading)
 - Switch Generator parallel to mains
- Two alternative breaker transition modes operation selectable
- Breaker mode is selectable “CBA/CBB” (LS-5x2) or “CBA” (LS-5x1)
- Dead bus closure to load condition



- Extended Dead bus closure mode (only with breaker logic parallel)



- Variable system selectable with LM:
The variable system is now selectable with the status from a LM
- Slip synchronization with a separate offset (application mode “LS5”):
For the CBA and CBB it is possible to synchronize the breaker with a separate slip offset. This separate slip can be a negative or positive offset as well. This function works only with the easYgen-3000XT (software version 1.13 and higher).

Communication with easYgen and other LS-5

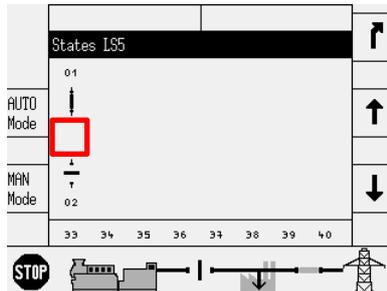
General

The LS-5x2 v2 (software version 2.xx) works in combination with the existing LS-5x1, easYgen-3500, and easYgen-3500XT. All devices are connected to the CAN interface (easYgen-3500: CAN3 interface)

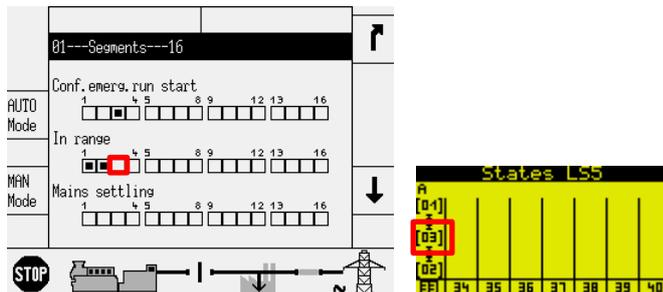
Restricted use with easYgen-3500

LS-5 in combination with the existing easYgen-3500 comes with the following restrictions:

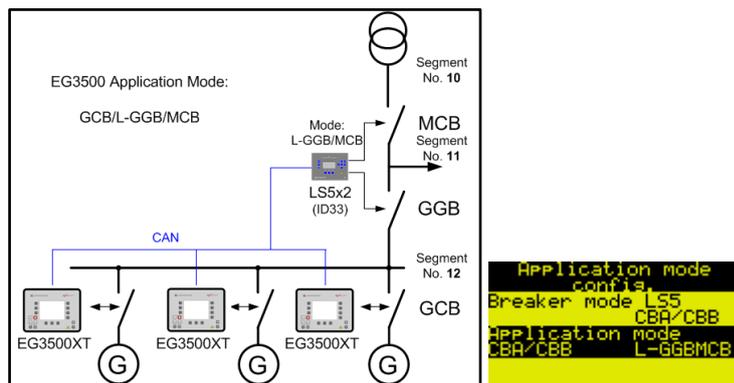
- Visualization from the load segment doesn't work



- Emergency start condition with the load segment is not possible



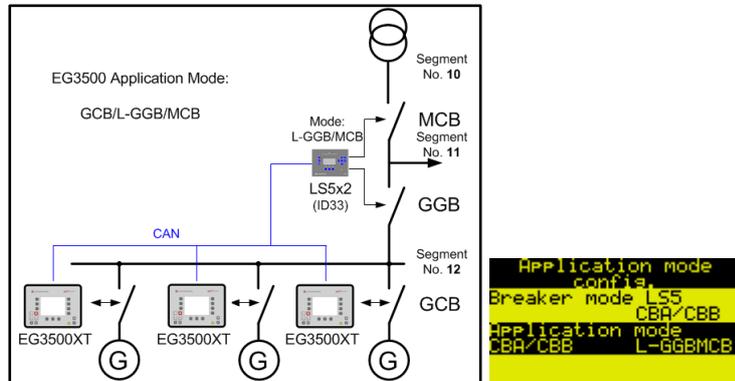
- Application mode L-GGBMCB is not supported



Restricted use with easYgen-3500XT

LS-5 in combination with the easYgen-3500XT (software version <1.13) comes with the following restriction:

- Application mode L-GGB/VCB is not supported



Communication with PLC

New Data Telegram

With software version 2.xx an additional Data Protocol 5302 is available. It is based on 5301 but extended for *Total active power* of system A and B.

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