



Active Breakout box

for Series 61 CAN, LIN, K-Line & FlexRay Controllers

User Manual

(Translation of Original docu)

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1 Concept of the Device

The Breakout box for Series 61 allows simple way access (due to separate plug connectors and terminal blocks) to the signals (different according to the connected device!) of the following GOPEL electronic hardware:

- PXI/ PCI/ USB/ basicCAN 6153
- PXI/ PCI/ USB/ basicLIN 6173
- PXI/ PCI/ USB/ basicCAR 6181
- PXI/ PCI/ USB/ basicFlex 6191



The Series 61 hardware is connected to the Breakout box for Series 61 by the supplied SCSI Connecting cable (via the connector which can be seen at the right side of Figure 1-1). The female for the AC adaptor plug is mounted at the device's back side.



Figure 1-1: Breakout box for Series 61



For PXI/ basic MOST 6161 hardware there is a Passive Breakoutbox available.

If necessary, please refer to the corresponding Manual.

2 Connectors and Display Elements

The following components are arranged at the Breakout box for Series 61 device:

- Uint - Power supply entry and Status LED
- DO 1..DO 8 - Status LEDs for the display of operating states
- Port1..Port4 - Females for four communication interfaces (CAN/ LIN/ KLine possible for each female)
- Port5, Port6 - Females for two FlexRay interfaces with two channels each (alternatively: Port5 - one FlexRay interface with two channels and two additional CAN interfaces on Port6, 7)
- Terminal Blocks - DI 1..DI 8, DO 1..DO 8 Digital signals
AI 1..AI 6, AO 1..AO 6 Analog signals
for digital and analog Inputs/ Outputs and Power supply
- X1 - Main connector to connect the Series 61 Hardware



For operating a Breakout box for Series 61 connecting the delivered AC adaptor plug is required (see [Notes on Delivery](#)).

2.1 X1 Main Connector at the frontal Side

The X1 Main Connector has the same pin assignment as the Frontal connector of a Series 61xx controller (see [Appendix](#)):



*Figure 2-1:
X1 Main Connector*

2.2 Elements arranged Top

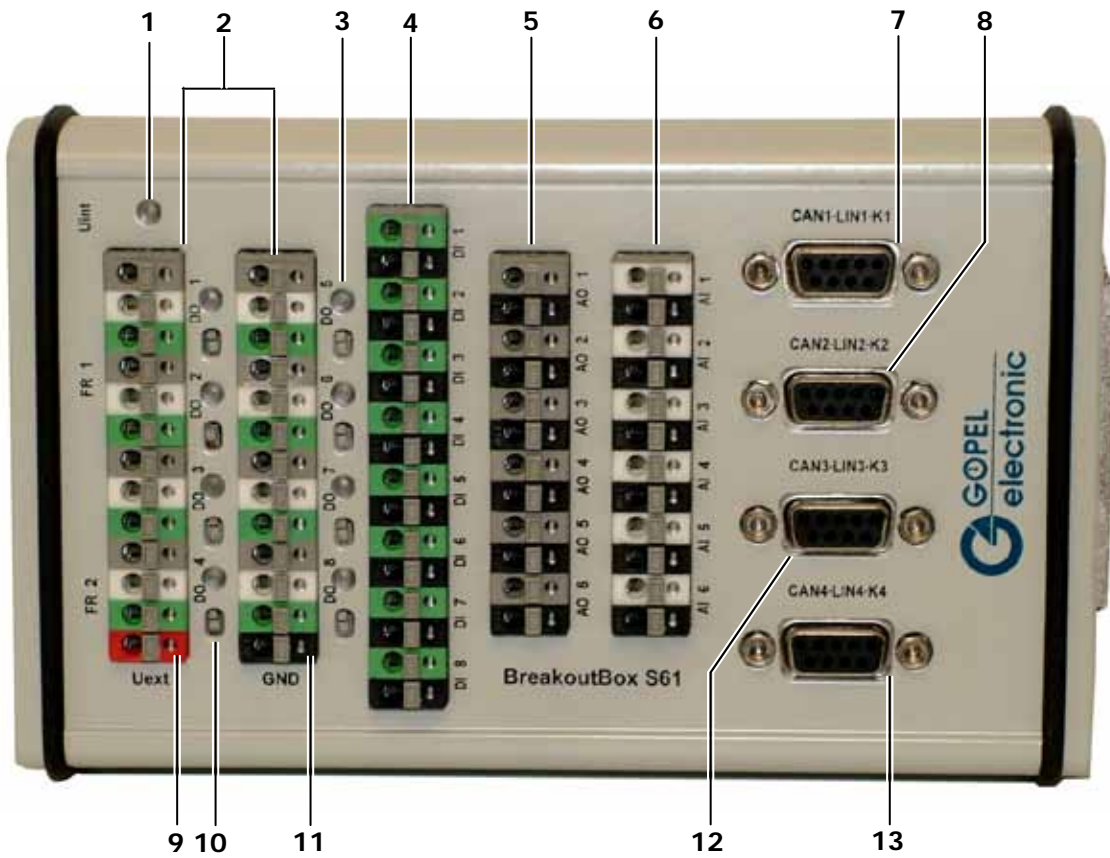


Figure 2-2: Breakout box for Series 61 - Top

- (1) Power ON LED (green)
- (2) DOUT - Digital Output Interface (Relays, PWM)
- (3) DO_5...DO_8 - LEDs for ON/ OFF Relay State (blue)
- (4) DINT - Digital Input Interface
- (5) AOUT - Analog Output Interface
- (6) AIN - Analog Input Interface

- (7) CAN1, LIN1, K1 - CAN, LIN, K-Line Interface
- (8) CAN2, LIN2, K2 - CAN, LIN, K-Line Interface

- (9) +Uext - External Power Supply for Series 61 Module
- (10) DO_1...DO_4 - LEDs for ON/ OFF Relay State (blue)
- (11) GND - External Power Supply for Series 61 Module

- (12) CAN3, LIN3, K3 - CAN, LIN, K-Line Interface
- (13) CAN4, LIN4, K4 - CAN, LIN, K-Line Interface

2.3 Elements on the Rear Side

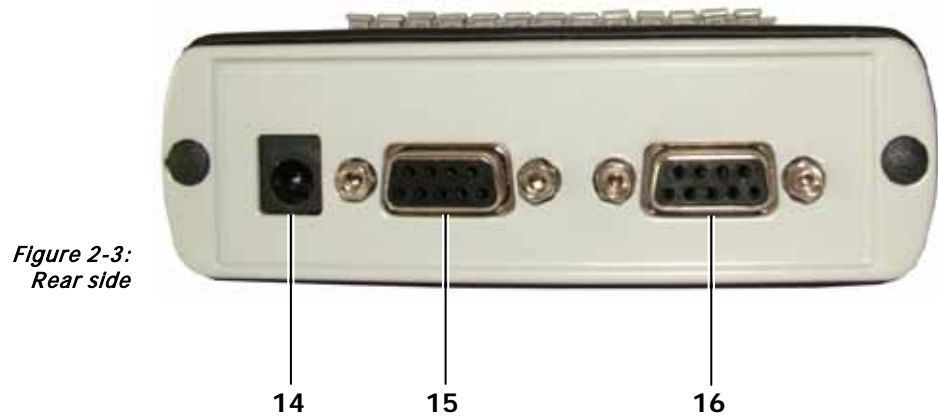


Figure 2-3:
Rear side

(14) Uint - Internal Power Supply (12VDC...24VDC)

(15) FlexRay1

(16) FlexRay2/ CAN5, 6

2.4 Communication Interfaces

2.4.1 CAN/ LIN/ K-Line (Port1..4)

Type: DSub 9poles female

For Series 61 Hardware with CAN/ LIN/ K-Line Interfaces

Pin	Signal name	Notes
1		
2	CANx_L	Only for CAN
3	GND _{ISO}	
4		
5		
6		
7	CANx_H/ LIN/ K-Line	Depends on Series 61 Hardware
8		
9	UBAT _{ext}	Depends on Series 61 Hardware

The diagram shows a transformer-like structure with 9 pins. Pin 1 is connected to pin 8. Pin 2 is labeled CANx_L. Pin 3 is labeled GND. Pin 4 is connected to pin 5. Pin 6 is connected to pin 9. Pin 7 is labeled CANx_H. Pin 9 is labeled UBATextern. The transformer has a '+' sign in the center and is labeled CANx.

2.4.2 FlexRay
(Port 5)

Type: DSub 9 poles female
For Series 61 Hardware with CAN/ LIN/ K-Line Interfaces and additional FlexRay Interface

Pin	Signal name	Notes	
1			
2	FlexRayA_BM		
3	GND _{ISO}		
4	FlexRayB_BM		
5			
6			
7	FlexRayA_BP		
8	FlexRayB_BP		
9			

2.4.3 FlexRay/
CAN (Port 6, 7)

Type: DSub 9 poles female
For Series 61 Hardware with CAN/ LIN/ K-Line Interfaces and additional FlexRay Interface

Pin	Signal name	Notes	
1			
2	FlexRayA_BM/ CAN5_L	Depends on Series 61 Hardware	
3	GND _{ISO}		
4	FlexRayB_BM/ CAN6_L	Depends on Series 61 Hardware	
5			
6			
7	FlexRayA_BP/ CAN5_H	Depends on Series 61 Hardware	
8	FlexRayB_BP/ CAN6_H	Depends on Series 61 Hardware	
9			

2.5 I/O Signals

All Analog signals (AI1..AI6, AO1..AO6) and all Digital signals (DI1..DI8), (DO1..DO8) as well as the Power supply inputs Uext/ GND can be individually tapped respectively fed-in via Terminal blocks at the cover's top-side.

2.5.1 Digital (Relais, PWM) Outputs

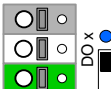
Each Digital output can be selected either as Relay output or as PWM output of the Series 61 Controller via a Side switch.

The Side switches are mounted sunk-in next to the Terminal blocks. You can switch them by corresponding tools through the openings of the cover.

2.5.1.1 Relay Outputs

Switch the Side switches of the Terminal blocks as follows and provide a Uint voltage of 12VDC..24VDC for the relays driver (via the supplied AC adaptor plug).

The green Uint LED for the Power supply input indicates the availability of the proper voltage for the Relays driver, while the blue DO1..DO8 LEDs indicate the ON/ OFF state of the relays.

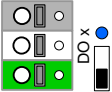
Digital Output	Position of the Side Switches
Relays	

Availability of the Relay outputs at the Terminal blocks:











Port	Signal	NO	NC	COMM	Port	Signal	NO	NC	COMM
DO 1	NO1				DO 5	NO5			
	NC1					NC5			
	COMM1					COMM5			
DO 2	NO2				DO 6	NO6			
	NC2					NC6			
	COMM2					COMM6			
DO 3	NO3				DO 7	NO7			
	NC3					NC7			
	COMM3					COMM7			
DO 4	NO4				DO 8	NO8			
	NC4					NC8			
	COMM4					COMM8			
Uext	12..27VDC				GND	GND			

The Relays are dimensioned for 24V/ 1A maximal switching power. External power supply Uext = 12..27VDC (for Series 61 Hardware)

2.5.1.2 *PWM Outputs* Switch the Side switches of the Terminal blocks as follows:

Digitale Output	Position of the side switches
PWM	

Availability of the PWM outputs at the Terminal blocks:

Port		Signal	Port		Signal
DO 1		PWM1	DO 5		PWM5
DO 2		PWM2	DO 6		PWM6
DO 3		PWM3	DO 7		PWM7
DO 4		PWM4	DO 8		PWM8
Uext		12..27VDC	GND		GND

External Power supply Uext = 12..27VDC (for Series 61 Hardware)













2.5.2 Digital Inputs

Pin		Digital Input
1		DI_1
2		DGND_1
3		DI_2
4		DGND_2
5		DI_3
6		DGND_3
7		DI_4
8		DGND_4
9		DI_5
10		DGND_5
11		DI_6
12		DGND_6
13		DI_7
14		DGND_7
15		DI_8
16		DGND_8



The number of available digital inputs depends on the assembly of the Series 61 hardware.













2.5.3 Analog Outputs

Pin		Analog Output
1		AO_1
2		GND
3		AO_2
4		GND
5		AO_3
6		GND
7		AO_4
8		GND
9		AO_5
10		GND
11		AO_6
12		GND



The number of available analog outputs depends on the assembly of the Series 61 hardware.

2.5.4 Analog Inputs

Pin		Analog Input
1		AI_1
2		GND
3		AI_2
4		GND
5		AI_3
6		GND
7		AI_4
8		GND
9		AI_5
10		GND
11		AI_6
12		GND



The number of available analog inputs depends on the assembly of the Series 61 hardware.

2.6 Connecting cable

The connecting cable between the Breakoutbox and the Series 61xx Controller is 1m long with 68 pin SCSI (female) connectors at both ends with a pin assignment just the same as the Series 61xx Hardware (see [Appendix](#)).



3 Notes on Delivery

Together with your Breakout box for Series 61 CAN, LIN, K-Line or FlexRay Controllers we deliver the following items:

- 1 AC adaptor plug
- 1 SCSI Connecting cable

4 Appendix

Pinout of the Frontal Connector of Series 61 CAN, LIN, K-Line and FlexRay Controllers

Pin	Signal			Pin	Signal	
1	CAN1_H	LIN1	K-Line1	35	R _{low} -CAN1_H	*) UBat _{extern_iso1}
2	CAN1_L		L-Line1	36	R _{low} -CAN1_L	*) GND _{iso1}
3	GND _{iso}			37	UBAT _{extern1}	*) do not connect!
4	CAN2_H	LIN2	K-Line2	38	R _{low} -CAN2_H	*) UBat _{extern_iso2}
5	CAN2_L		L-Line2	39	R _{low} -CAN2_L	*) GND _{iso2}
6	GND _{iso}			40	UBAT _{extern2}	*) do not connect!
7	CAN3_H	LIN3	K-Line3	41	R _{low} -CAN3_H	*) UBat _{extern_iso3}
8	CAN3_L		L-Line3	42	R _{low} -CAN3_L	*) GND _{iso3}
9	GND _{iso}			43	UBAT _{extern3}	*) do not connect!
10	CAN4_H	LIN4	K-Line4	44	R _{low} -CAN4_H	*) UBat _{extern_iso4}
11	CAN4_L		L-Line4	45	R _{low} -CAN4_L	*) GND _{iso4}
12	GND _{iso}			46	UBAT _{extern4}	*) do not connect!
13	FlexRay1A_BP			47	FlexRay1B_BP	
14	FlexRay1A_BM			48	FlexRay1B_BM	
15	GND _{iso}			49	GND _{iso}	
16	FlexRay2A_BP	CAN5_H		50	FlexRay2B_BP	CAN6_H
17	FlexRay2A_BM	CAN5_L		51	FlexRay2B_BM	CAN6_L
18	GND _{iso}			52	GND _{iso}	
19	DIGITAL_OUT1			53	DIGITAL_IN1	
20	DIGITAL_OUT2			54	DIGITAL_IN2	
21	DIGITAL_OUT3			55	DIGITAL_IN3	
22	DIGITAL_OUT4			56	DIGITAL_IN4	
23	IO_EXP1			57	IO_EXP11	
24	IO_EXP2			58	IO_EXP12	
25	IO_EXP3			59	IO_EXP13	
26	IO_EXP4			60	IO_EXP14	
27	GND _{iso}			61	UEXT _{IO}	
28	IO_EXP5			62	IO_EXP15	
29	IO_EXP6			63	IO_EXP16	
30	IO_EXP7			64	IO_EXP17	
31	IO_EXP8			65	IO_EXP18	
32	IO_EXP9			66	IO_EXP19	
33	IO_EXP10			67	IO_EXP20	
34	GND _{iso}			68	GND _{iso}	

The pinout of the **Communication interfaces** is in accordance with the plugged-in Transceiver resp. the Additional FlexRay or CAN board, while the pins **23..33** and **57..67** have different functionality according to the type of the used IO Extension Board.

*) For isolated LIN Transceivers

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