Active Breakout box

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

User Manual
(Translation of Original docu)
Document Version 1.1

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Printed: 17.02.2015

Issue: February 2015

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 GOEPEL 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

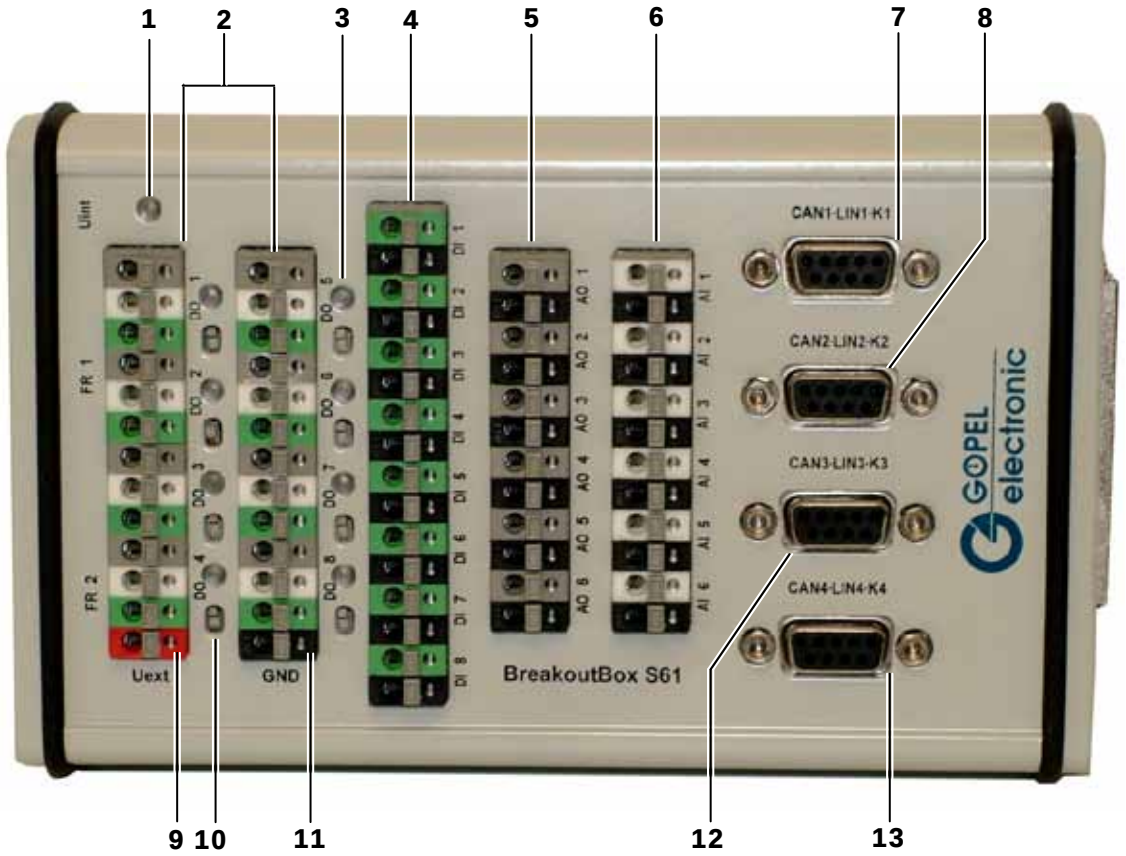


Figure 2-2: Breakout box for Series 61 - Top

(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

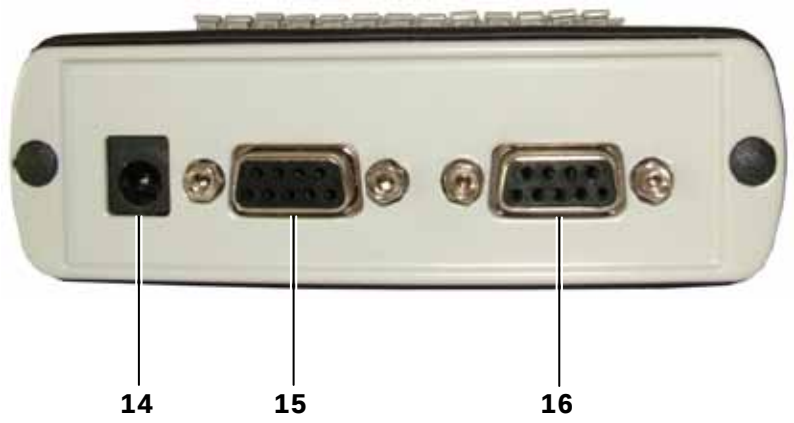


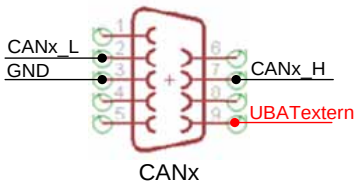
Figure 2-3: Rear side

(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)

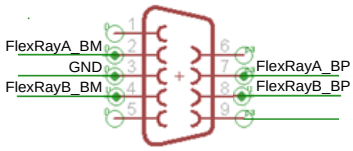
Type: DSub 9poles female
For Series 61 Hardware with CAN/ LIN/ K-Line Interfaces

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	

2.4.2 FlexRay (Port 5)

Type: DSub 9 poles female

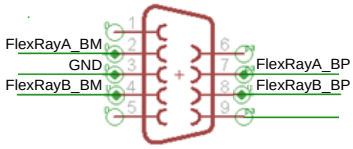
For Series 61 Hardware with CAN/ LIN/ K-Line Interfaces and additional FlexRay Interface

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.

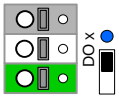
2.5.1 Digital (Relais, PWM) Outputs

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	

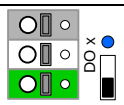
Availability of the Relay outputs at the Terminal blocks:

Port	Signal	Port	Signal
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