







UK Type Examination Certificate CML 21UKEX2663X Issue 0**United Kingdom Conformity Assessment**

- 1 Product or Protective System Intended for use in Potentially Explosive Atmospheres UKSI 2016:1107 (as amended) – Schedule 3A, Part 1
- 2 Equipment **LB Remote I/O Module, Series (LB **** **)**
- 3 Manufacturer **Pepperl+Fuchs SE**
- 4 Address **Lilienthalstrasse 200,
68307 Mannheim,
Germany**
- 5 The equipment is specified in the description of this certificate and the documents to which it refers.
- 6 Eurofins E&E CML Limited, Newport Business Park, New Port Road, Ellesmere Port, CH65 4LZ, United Kingdom, Approved Body Number 2503, in accordance with Regulation 43 of the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016, UKSI 2016:1107 (as amended), certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Schedule 1 of the Regulations.

The examination and test results are recorded in the confidential reports listed in Section 12.
- 7 If an 'X' suffix appears after the certificate number, it indicates that the equipment is subject to specific conditions of use (affecting correct installation or safe use). These are specified in Section 14.
- 8 This UK Type Examination certificate relates only to the design and construction of the specified equipment. Further requirements of the Regulations apply to the manufacturing process and supply of the product. These are not covered by this certificate.
- 9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the confidential report, has been demonstrated through compliance with the following documents:

EN IEC 60079-0:2018 EN 60079-11:2012

- 10 The equipment shall be marked with the following:

 II (1) G [Ex ia Ga] IIC/IIB	or	 II (2) G [Ex ib Gb] IIC/IIB	or
 II (1) D [Ex ia Da] IIIC	or	 II (2) D [Ex ib Db] IIIC	or
 I (M1) [Ex ia Ma] I	or	 I (M2) [Ex ib Mb] I	



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11 Description

The LB Remote I/O Modules of type series (LB **** **) consist of input & output modules. Depending on application, temperature sensors, initiators, or field devices which are installed inside the hazardous area may be connected to the modules. The sensor signals are transmitted to a local bus by means of an electronically isolated interface. The modules are mounted on the rear side on a separately certified PCB (backplane) outside of the hazardous area and they shall be operated only with this backplane. The supply with auxiliary power as well as the interconnection of the modules and the connections to bus-coupler and external terminals are provided by this backplane. One backplane carries upto 24 I/O-modules with the required power supply units.

The permissible range of the ambient temperature is: -40 °C up to +60 °C.

Electrical data

Supply circuit (terminals X1: 3/14, X1:2/15)	12V DC +4%/-2 % (SELV) from supply module, type LB 9006* or LB 9104* through backplane, type LB 9022* ... LB 9029*, LB 9035* or LB 9101*... LB 9103*. Um=30V
Bus-interface (terminals X1:5/12)	U = 2.5V ±2.5 V TTL-level (SELV) Um=30V
Shutdown signal for I/O-modules (module LB 2101 ...LB 2113, LB 6108) (terminals X1:7, X1: 10)	UN = 12 ... 30 V DC (SELV) Um=60V
External voltage supply (module LB 6110 ... LB 6115) (terminals X1: 8, X1: 9)	UN= 24 V DC (SELV/PELV) Um=60V

Modules:

The following applies to intrinsically safe circuits with linear output characteristic:

The values of the external reactances L_o and C_o specified in the following tables may be applied if one of the following conditions is met:

- the total value of the internal inductance L_i of the external circuit (excluding cable) is < 1 % of the L_o -value

or

the total value of the internal capacitance C_i of the external circuit (excluding cable) is < 1 % of the C_o -value



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The values of the external reactances L_o and C_o specified in the following tables shall be reduced to maximum 50% if both of the following conditions are met:

- the total value of the internal inductance L_i of the external circuit (excluding cable) is $> 1\%$ of the L_o -value

and

the total value of the internal capacitance C_i of the external circuit (excluding cable) is $> 1\%$ of the C_o -value.

In addition the reduced capacitance of the external circuit (including cable) shall not exceed the values of $1\ \mu\text{F}$ for groups I, IIA and IIB and $600\ \text{nF}$ for group IIC.

The values of the maximum permissible external reactances for intrinsically safe circuits with **non linear output characteristic** are specified in the tables beginning on page 8. These values were calculated using the ISPARK-program, version 6.2 and they apply to the simultaneous existence of both types of reactances (C_o and L_o).

LB 110* * Digital input** type of protection Intrinsic Safety Ex ia IIC
 Input circuit(s) or Ex ia IIB
 or Ex ia IIA
 or Ex ia I
 or Ex ia IIIC

For maximum values of the respective type, reference is made to the following table:

Module Type Terminal assignment	Type of circuit	Maximum values (per channel)						Ex ia IIC		Ex ia IIB / Ex ia IIIC		Ex ia IIA		Ex ia I	
		Charac- teristic	U_o [V]	I_o [mA]	P_o [mW]	C_i [nF]	L_i [mH]	C_o [μF]	L_o [mH]	C_o [μF]	L_o [mH]	C_o [μF]	L_o [mH]	C_o [μF]	L_o [mH]
LB1101* ch1: 1(+), 2(-) ch2: 4(+), 5/6(-)	2 Inputs	linear	12.6	12.8	40.1	1.65	0	1.15	100	7.4	100	27	100	29	100
LB1102* ch1: 1(+), 2(-) ch2: 4(+), 5(-) ch3: 3(+), 6(-)	3 Inputs	linear	10.5	35*	92*	5	0	2.41	29	16.8	100	75	100	95	100
LB1103*, LB1104* ch1: 1(+), 2(-) ch2: 4(+), 5(-) all (-) connected internally	2 Inputs	linear	10.5	23.34*	61.27*	3.3	0	2.41	65	16.8	100	75	100	95	100



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LB1108* ch1-8: 1/3/5/9/11/13/15(+) 2/4/8/10/12/14/16(-) All (-) connected internally	8 Inputs	linear	14.9	15.7	58.2	1.65	0	0.59	100	3.65	100	14.3	100	16.3	100
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LB 21 *** Digital output and 2 inputs** type of protection Intrinsic Safety Ex ia IIC
 Input and output circuit(s) or Ex ia IIB
 or Ex ia IIA
 or Ex ia I
 or Ex ia IIIC

For maximum values of the respective type, reference is made to the following table:

Module Type Terminal assignment	Type of circuit	Maximum values (per channel)						Ex ia IIC		Ex ia IIB / Ex ia IIIC		Ex ia IIA		Ex ia I	
		Charac- teristic	U _o [V]	I _o [mA]	P _o [mW]	C _i [nF]	L _i [mH]	C _o [μF]	L _o [mH]	C _o [μF]	L _o [mH]	C _o [μF]	L _o [mH]	C _o [μF]	L _o [mH]
LB2101* 1(+), 4(-)	1 Output	linear	24.9	91	558	1.65	0	0.11	4	0.848	16	3.0	34	4.30	39
ch1: 2(+), 5(-) ch2: 3(+), 6(-)	2 Inputs	linear	14.1	16	55	1.65	0	0.708	100	4.48	100	16.69	100	20	100
LB2102* 1(+), 4(-)	1 Output	linear	27.83	183	1270	1.65	0	N/A	N/A	0.657	4	2.17	6	3.45	7.4
ch1: 2(+), 5(-) ch2: 3(+), 6(-)	2 Inputs	linear	14.1	16	55	1.65	0	0.708	100	4.48	100	16.69	100	20	100
LB2103* 1(+), 4(-)	1 Output	linear	27.83	91.7	636	1.65	0	0.082	4	0.657	16	2.17	33	3.8	54
ch1: 2(+), 5(-) ch2: 3(+), 6(-)	2 Inputs	linear	14.1	16	55	1.65	0	0.708	100	4.48	100	16.69	100	20	100
LB2104* 1(+), 4(-)	1 Output	linear	24.2	145	872	1.65	0	0.12	1.69	0.9	6.7	3.26	10	4.5	14
ch1: 2(+), 5(-) ch2: 3(+), 6(-)	2 Inputs	linear	14.1	16	55	1.65	0	0.708	100	4.48	100	16.69	100	20	100
LB2105* 1(+), 4(-)	1 Output	linear	25.2	108	681	1.65	0	0.105	3	0.81	12	2.89	20	4.15	26
ch1: 2(+), 5(-) ch2: 3(+), 6(-)	2 Inputs	linear	14.1	16	55	1.65	0	0.708	100	4.48	100	16.69	100	20	100
LB2112* 1(+), 4(-)	1 Output	linear	27.83	108.2	751	1.65	0	0.082	3	0.657	12	2.17	20	3.45	25
ch1: 2(+), 5(-) ch2: 3(+), 6(-)	2 Inputs	linear	14.1	16	55	1.65	0	0.708	100	4.48	100	16.69	100	20	100
LB2113* 1(+), 4(-)	1 Output	linear	28.7	68	485	1.65	0	0.075	7.5	0.616	30	2.0	50	3.25	100
ch1: 2(+), 5(-) ch2: 3(+), 6(-)	2 Inputs	linear	14.1	16	55	1.65	0	0.708	100	4.48	100	16.69	100	20	100



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LB 510* * Digital input**
Input circuit

type of protection Intrinsic Safety Ex ia IIC
or Ex ia IIB
or Ex ia IIA
or Ex ia I
or Ex ia IIIC

Module LB 5104. for connection to temperature sensors.

Module LB 5106.*** appropriate for connection to a certified intrinsically safe circuit with the maximum value: $U_j = 30V$.

The rules for the interconnection of intrinsically safe circuits shall be observed here.

For maximum values of the respective type, reference is made to the following table:

Module Type Terminal assignment	Type of circuit	Maximum values						Ex ia IIC		Ex ia IIB / Ex ia IIIC		Ex ia IIA		Ex ia I	
		Charac- teristic	U_o [V]	[mA]	[mW]	C_i [nF]	L_i [mH]	C_o [μF]	L_o [mH]	C_o [μF]	L_o [mH]	C_o [μF]	L_o [mH]	C_o [μF]	L_o [mH]
LB5104* ch1: 1,2,3,4 ch2: 5,6,7,8 ch3: 9,10,11,12 ch4: 13,14,15,16	4 Inputs	linear	7.14	70*	123*	52	0	13.4	7	240	29	1000	58	1000	95
LB5106* 5(+), 6(-)	1 Input	linear	0.9	0.2	0.2	52	0	100	100	1000	100	1000	100	1000	100



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LB 611* * Digital input**
Output circuit(s)

type of protection Intrinsic Safety
Ex ia IIC
or Ex ia IIB
or Ex ia IIA
or Ex ia I
or Ex ia IIIC

For maximum values of the respective type,
reference is made to the following table:

Module Type Terminal assignment	Type of circuit	Maximum values (for each channel)						Ex ia IIC		Ex ia IIB / Ex ia IIIC		Ex ia IIA		Ex ia I	
		Charac- teristic	U _o [V]	I _o [mA]	P _o [mW]	C _i [nF]	L _i [mH]	C _o [μF]	L _o [mH]	C _o [μF]	L _o [mH]	C _o [μF]	L _o [mH]	C _o [μF]	L _o [mH]
LB6110* ch1: 1(+), 2(-) ch2: 3(+), 4(-) ch3: 5(+), 6(-) ch4: 7(+), 8(-)	4 Outputs	linear	27.8	90.4	629	1.65	0	0.082	4	0.657	17	2.17	34.8	3.8	57
LB6111* ch1: 1(+), 2(-) ch2: 3(+), 4(-) ch3: 5(+), 6(-) ch4: 7(+), 8(-)	4 Outputs	linear	27.8	107	744	1.65	0	0.082	3	0.657	12	2.17	24.8	3.8	40
LB6112* ch1: 1(+), 2(-) ch2: 3(+), 4(-) ch3: 5(+), 6(-) ch4: 7(+), 8(-)	4 Outputs	linear	19.8	142	705	1.65	0	0.225	1.7	1.43	7.0	5.64	14	8.2	23
LB6113* ch1: 1(+), 2(-) ch2: 3(+), 4(-) ch3: 5(+), 6(-) ch4: 7(+), 8(-)	4 Outputs	linear	26	110	714	1.65	0	0.097	2.9	0.76	11.7	2.59	23.5	4.4	37
LB6114* ch1: 1(+), 2(-) ch2: 3(+), 4(-) ch3: 5(+), 6(-) ch4: 7(+), 8(-)	4 Outputs	linear	26	88.7	578	1.65	0	0.097	4.5	0.76	18	2.59	36	4.4	59
LB6115* ch1: 1(+), 2(-) ch2: 3(+), 4(-) ch3: 5(+), 6(-) ch4: 7(+), 8(-)	4 Outputs	linear	18.9	286	1351	1.65	0	0.26	0.43	1.59	1.7	6.38	3.4	9	5.7



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LB 510* * Digital input**
Input circuit(s)

type of protection Intrinsic Safety

Ex ia IIC
or Ex ia IIB
or Ex ia IIA
or Ex ia I
or Ex ia IIIC

For maximum values of the respective type,
reference is made to the following table:

Module Type Terminal assignment	Type of circuit	Charac-teristic	Maximum values					Ex ia IIC		Ex ia IIB / EX ia IIIC		Ex ia IIA		Ex ia I	
			U _o [V]	I _o [mA]	P _o [mW]	C _i [nF]	L _i [mH]	C _o [μF]	L _o [mH]	C _o [μF]	L _o [mF]	C _o [μF]	L _o [mH]	C _o [μF]	L _o [mH]
LB5101* 2-wire connection: 5, 6 3-wire connection: 5, 1, 6 4-wire connection: 2, 5, 1, 6	1 Input	trapezoidal	2.7	43	93	750	0	2.25	10	11.25	50	23	50	54	20
		Ri = 330 Ω													
LB5102* 5(+), 6(-) Cold junction: 1(+), 2(-)	1 Input	trapezoidal	1.8	43	67	100	0	8.7	10	30	50	58	50	86	50
		Ri = 330 Ω													
LB5105* ch1: 1(+), 2(-) ch2: 5(+), 6(-) ch3: 9(+), 10(-) ch4: 13(+), 14(-)	4 Inputs	trapezoidal	1.0	71*	62*	0	0	33	5	140	20	250	20	350	20
		Ri = 500Ω													

The values of the maximum permissible external reactances (Lo, Co) were calculated using the ISARK program, version 6.2. These apply to the simultaneous existence of both types of reactances (Co and Lo).



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LB 6108 * Digital input**
Output circuit(s)

type of protection Intrinsic Safety
Ex ib IIC
or Ex ib IIB
or Ex ib IIA
or Ex ib I
or Ex ib IIIC

For maximum values of the respective type,
reference is made to the following table:

Module Type Terminal assignment	Type of circuit	Maximum values (for each channel)						Ex ib IIC		Ex ib IIB / Ex ib IIIC		Ex ib IIA		Ex ib I	
		Charac- teristic	U _o [V]	I _o [mA]	P _o [mW]	C _i [nF]	L _i [mH]	C _o [μF]	L _o [mH]	C _o [μF]	L _o [mH]	C _o [μF]	L _o [mH]	C _o [μF]	L _o [mH]
LB6108A ch1: 1(+), 2(-) ch2: 3(+), 4(-) ch3: 5(+), 6(-) ch4: 7(+), 8(-) ch5: 9(+), 10(-) ch6: 11(+),12(-) ch7: 13(+),14(-) ch8: 15(+),16(-) all (-) connected internally	8 Outputs	rectangular	28	13.5	376	3.6	0	0.076	0.5	0.38	1	0.48	2	0.63	20
LB6108C ch1: 1(+), 2(-) ch2: 3(+), 4(-) ch3: 5(+), 6(-) ch4: 7(+), 8(-) ch5: 9(+), 10(-) ch6: 11(+),12(-) ch7: 13(+),14(-) ch8: 15(+),16(-) all (-) connected internally	8 Outputs	rectangular	30	13.5	404	3.6	0	0.062	0.5	0.346	1	0.42	2	0.52	20

The values of the maximum permissible external reactances (Lo, Co) were calculated using the ISPAK program, version 6.2. These apply to the simultaneous existence of both types of reactances (Co and Lo).

The following applies to all modules:

- The intrinsically safe circuits are safely electrically isolated from all other circuits up to a peak value of the nominal voltage of 375 V.
- The maximum values listed in the tables apply- unless otherwise specified- to one channel in each case.
- The values of the maximum permissible external reactances (Lo/Co) of the intrinsically safe circuits already include possibly existing internal reactances (Li/Ci).
- The rules for the interconnection of intrinsically safe circuits shall be observed.
- The permissible range of the ambient temperature is: Tamb = -40 °C up to +60 °C



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12 Certificate history and evaluation reports

Issue	Date	Associated report	Notes
0	16 Feb 2022	R14112Z/00	Prime Certificate issued.

Note: Drawings that describe the equipment are listed or referred to in the Annex.

13 Conditions of Manufacture

None.

14 Specific Conditions of Use

The following conditions relate to safe installation and/or use of the equipment.

- i. The LB Remote I/O Modules shall be installed and operated in an environment that guarantees a maximum pollution degree of 2 / overvoltage category II, according to EN 60664-1.
- ii. The LB Remote I/O Module shall be operated only with the corresponding associated backplane.

Certificate Annex

Certificate Number CML 21UKEX2663X
Equipment LB Remote I/O Module, Series (LB **** **)
Manufacturer Pepperl+Fuchs SE



The following documents describe the equipment defined in this certificate:

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For drawings describing the equipment, refer to attached certificate PTB 03 ATEX 2042X. In addition to the drawings listed on PTB 03 ATEX 2042X, the following drawings include the additional marking required for this UK Type Examination certification:

Drawing No	Sheets	Rev	Approved date	Title
16-1555CM-10	1 to 2	0	16 Feb 2022	Additional Marking Requirements for UKCA