

**Multi Barrier NMB204/NMB204-EX
(MB 204/MB 204-Ex)**

for PROFIBUS PA and FOUNDATION Fieldbus



- **Intrinsically safe power supply of up to 31 stations on the bus**
 - cascadable multi barrier
- **Intrinsically safe connection of up to 4 field devices per multi barrier**
 - in accordance with the FISCO model
- **Cascadable multi barrier**
- **Universal use for fieldbus protocols according to IEC 61158-2; 31.25 kbit/s**
 - transparent for all protocols
- **No separate power supply required**
 - power supply and communication with all common segment couplers (PA) or conditioners (H1), no Ex certificate
- **Integrated bus termination (can be enabled/disabled)**
- **Mounting in hazardous areas (zone 1) permissible**
- **Intrinsically safe connection methods: Screw-terminals for field devices**
- **EEx e bus lines and all devices on the bus remain fully operational in case of a short-circuit occurring in an intrinsically safe stub cable**
- **If a multi barrier should fail or be damaged, this does not affect the EEx-e bus line**



Technical data

Bus connection

Number of cascades

16 (2...16) depending on the number and current consumption of the field devices

Bus termination

Integrated, can be enabled/ disabled (default setting: disabled)

Supply voltage

$V_s = 16.5...30$ V DC (modulated communication signal)
The multi barrier has a power consumption of 2 mA

Connectors

4 screw-terminals, 2.5 mm², 4 A, shield connection with EMC cable gland direct to ground potential

Terminal assignment (bus connection)

	Bus +	Bus -
Bus (on)	1	2
Bus (off)	4	5

For segment couplers and conditioners without Ex certificate

PROFIBUS:
P + F: KFD2-BR-1.PA.93 24...26 V, 400 mA
Siemens:
6ES7157-0AC8D-0XA0 19 V, 400 mA
Fieldbus:
ABB:
Power Conditioner NMP100-NO 24...30 V, 1.7 A DC
Relcom:
Power Conditioner FCS-PCT 16...30 V, 330 mA
for each Power Conditioner separate power supply required

Field device connection

Number of field devices

4 (1...4)

Mechanical connection

2 screw terminals, 2.5 mm² per field device; shield connection with EMC cable gland direct to ground potential

Terminal assignment for bus connection

Field device	Bus +	Bus -
Channel 1	10	11
Channel 2	14	15
Channel 3	18	19
Channel 4	22	23

Connector specifications for non-explosion-proof model

Output voltage ≥ 12.7 V (with 30 mA)
Total output current ≤ 120 mA

Short-circuit proof per channel of the multi barrier MB 204 (Non-Ex version)

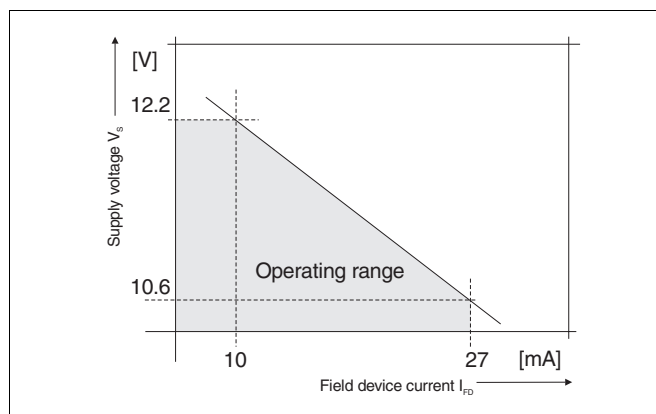
The output channels (field devices) of the multi barrier are short-circuit proof as long as the current consumption per channel does not exceed 30 mA.

The short-circuit current for one field device channel is:
 $I_{SC} \approx 47$ mA.

Specifications of explosion-proof model

V_s / [V]	I_{FD} / [mA]	I_{max} / [mA]
Field device voltage	Max. current per field device	Total current per barrier
≥ 12.20	10	100
≥ 11.7	15	100
≥ 11.2	20	100
≥ 10.6	27	100

Output characteristic



Maximum number of field devices per multi barrier MB 204-Ex (Ex version)

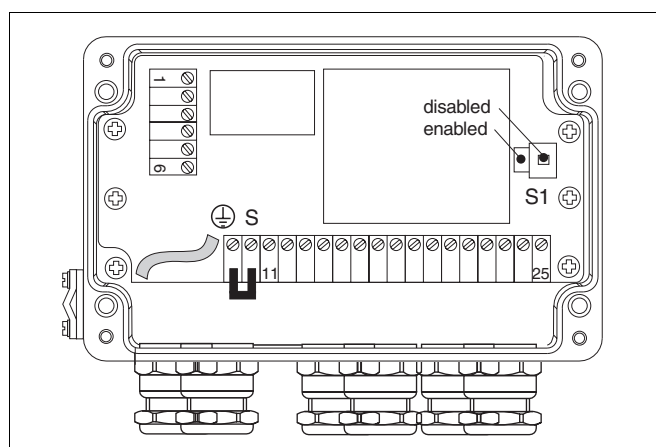
	I_{FD} [mA]	I_{MB} [mA]	Short-circuit proof per channel
Number of field device	Current per field device	Total current per MB	
4	10...20 mA	80 mA	Yes
3	20...26.6 mA	80 mA	Yes
4	20...25 mA	100 mA	No ¹⁾

¹⁾ In the event of a short-circuit on one or more field devices, the respective multi barrier automatically shuts down. The bus communication to the remaining multi barriers and field devices on the busline remains intact.

The short-circuit current of one Ex i channels is

$I_{SC} \approx 47$ mA.

Terminal assignment



Explosion protection

Explosion protection

II 2(1) G EEx me [ia] IIC T4

Bus line

EEx e

Current circuits of field devices

EEx ia IIC

EC type-examination certificate

PTB 00 ATEX 2064 X

For connection to fieldbus systems acc. to FISCO model, with the following features:

Ambient temperature	-20...+55 °C
Max. voltage	$V_o = 16.28 \text{ V DC}$
Max. current	$I_o = 207 \text{ mA}$
Max. power	$P_o = 840 \text{ mW}$
Internal resistance	$R_o = 78.8 \Omega$
Internal inductance	$L_i = \text{negligible}$
Internal capacitance	$C_i = \text{negligible}$
Output characteristic	linear

Environmental capabilities

Operating temperature	NMB204: -25...+75 °C NMB204-Ex: -20...+55 °C
Transport and storage temperature	-40...100 °C
Relative humidity	< 100 %
Condensation	permitted
MTBF	> 100 years

Mechanical specifications

Housing material	Aluminum die cast
Color	Light gray (RAL 9002)
Weight	1.25 kg (with. accessories)
Degree of protection	IP 65

Electrical connection

Metal screws (standard)

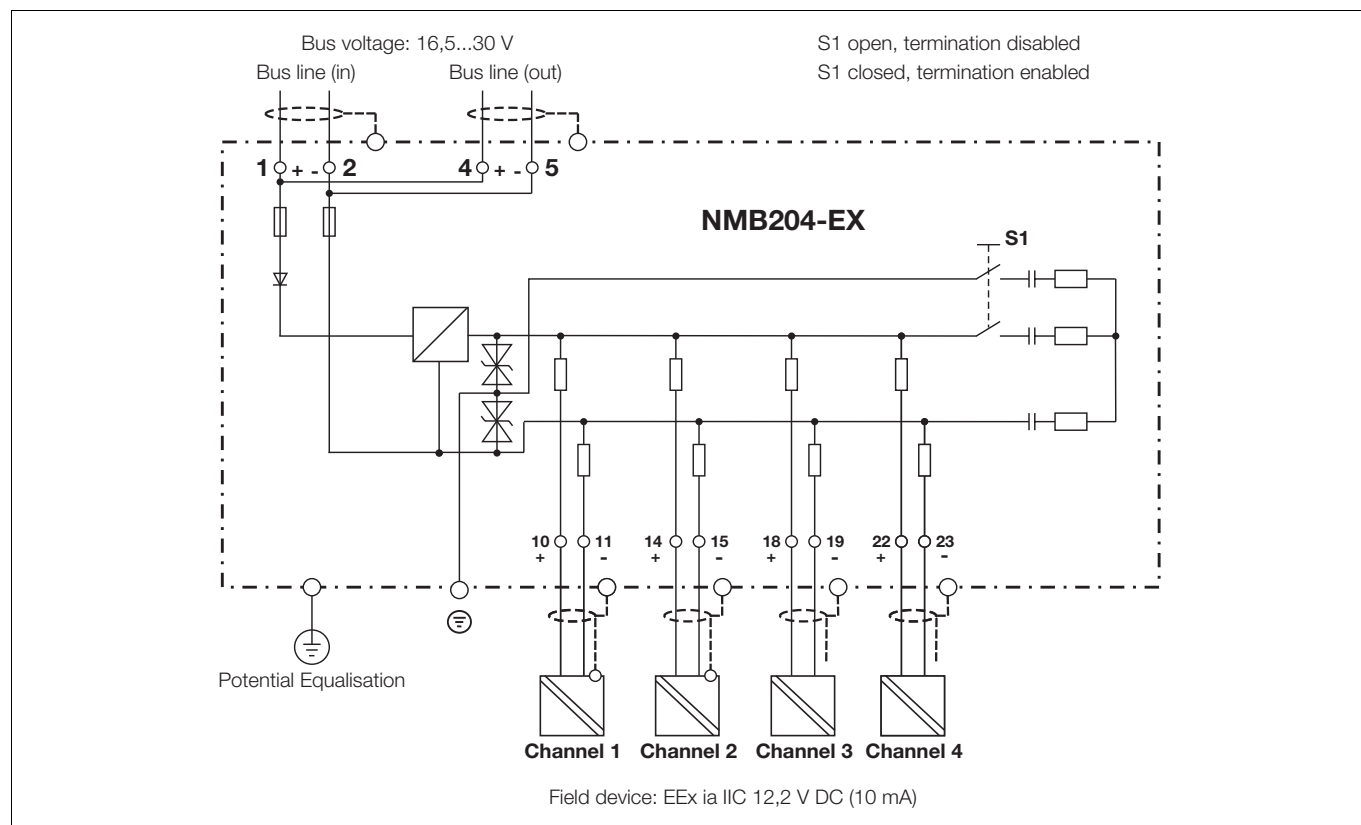
Bus connection

Cable gland	2 x M20 x 1.5
Max. cable diameter	7...12 mm

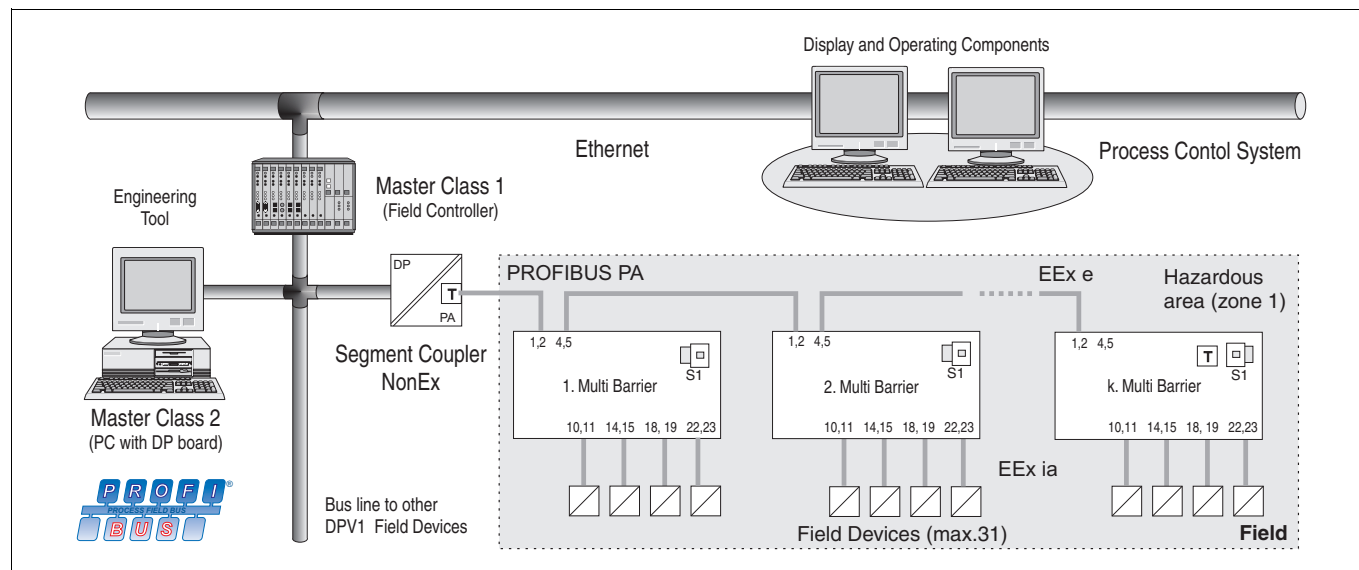
Field device connection

Cable gland	4 x M16 x 1.5
Max. cable diameter	5...10 mm
Cable gland	with shield connection

Block diagram



Example for PROFIBUS PA application

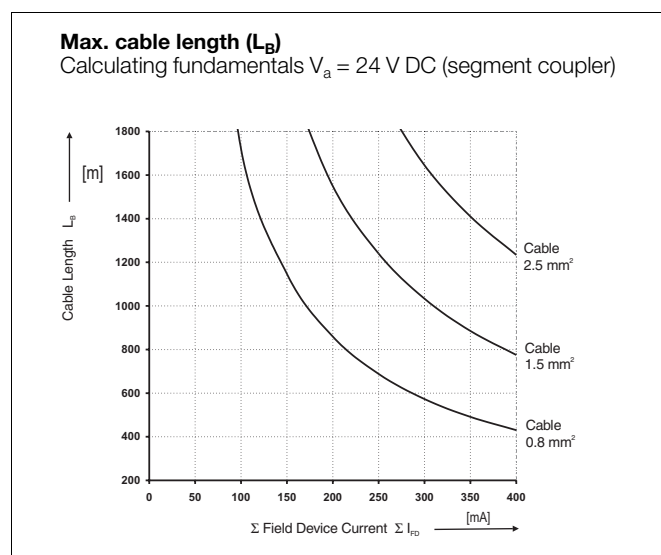


Cable type (loop)	A 43.6 Ω/km; 0.8 mm²		24.2 Ω/km; 1.5 mm² ¹⁾		15.2 Ω/km; 2.5 mm² ¹⁾	
Segment coupler V_a/I_a (max.)	24 V/400 mA	19 V/400 mA	24 V/400 mA	19 V/400 mA	24 V/400 mA	19 V/400 mA
Max. cable length SK-MB distributor (L_B) with max. coupler load ²⁾	430 m	145 m	775 m	255 m	1234 m	410 m
Number of connectable field devices per bus line, with stub cables < 30 m (values in brackets for stub cables < 1 m) ³⁾						
Current per field device 10 mA	24 (31)	24 (31)	24 (31)	24 (31)	24 (31)	24 (31)
Current per field device 15 mA	24 (26)	24 (26)	24 (26)	24 (26)	24 (26)	24 (26)
Current per field device 27 mA	14 (14)	14 (14)	14 (14)	14 (14)	14 (14)	14 (14)

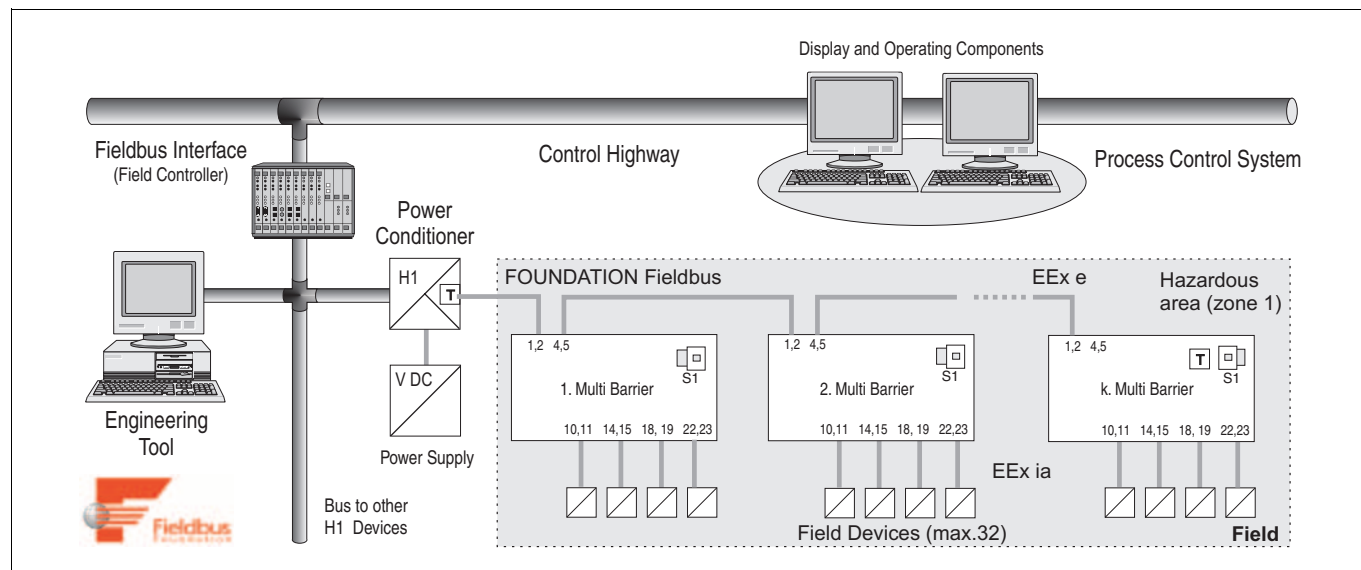
¹⁾ According to PROFIBUS PA commissioning directives as of 1996, draft version

²⁾ See table for cable lengths for lower current load

³⁾ to IEC 61158-2



Example for FOUNDATION Fieldbus (H1) application



Cable type (loop)	A (43.6 Ω/km; 0.8 mm²)		(24.2 Ω/km; 1.5 mm²)		(15.2 Ω/km; 2.5 mm²)	
Segment coupler V_a/I_a (max.)	26 V/400 mA	29 V/1.7 A	26 V/400 mA	29 V/1.7 A	26 V/400 mA	29 V/1.7 A
Max. cable length SK-MB distributor (L_B) with max. coupler load ¹⁾	545 m	169 m	981 m	304 m	1563 m	448 m
Number of connectable field devices per bus line, with stub cables < 30 m (values in brackets stub cables < 1 m) ²⁾						
Current per field device 10 mA	24 (31)	24 (31)	24 (31)	24 (31)	24 (31)	24 (31)
Current per field device 15 mA	24 (26)	24 (31)	24 (26)	24 (31)	24 (26)	24 (31)
Current per field device 27 mA	14 (14)	24 (31)	14 (14)	24 (31)	14 (14)	24 (31)

¹⁾ See table for cable lengths for lower current load (stub cables are added)

²⁾ to IEC 61158-2

