quantum× MX1615B

Strain gauge bridge amplifier

Special features

- 16 individually configurable inputs
- Connection of strain gauges in full-, half-, or quarter-bridge (120 or 350 Ohm)
- Bridge excitation : DC or carrier frequency
- Internal shunt resistor
- Connection of standard voltage, PT100, resistor, Potentiometer
- Individual data rates up to 20 kS/s per channel, active low pass filter
- 24-bit A/D converter per channel for synchronous, parallel measurements







Specifications MX1615B

General specifications				
Inputs	Number	16, electrically iso	lated from the supply	
Transducer technologies, can be adjusted individually		Strain gauges in full- , half- or quarter-bridge configurati (120 or 350 Ohm). Selectable bridge excitation voltage : voltage or carrier frequency 1200 Hz		
		SG-quarter bridges SG-half bridges SG-full bridges	Three wire and four wire five wire six wire	
		Resistor, Resistance thermo four-wire co	meter (PT100), connection in onfiguration	
		Potentiometri	c transducers	
		Voltage (±10 V differential, 0 30 V unipolar)		
A/D converter per channel		24 Bit Delta S	Sigma converter	
Sample rates (Domain adjustable by software, Factory setting is HBM Classic)	S/s	Decimal: 0 HBM Classic	0,120,000 x: 0,1 19,200	
Bandwidth	Hz	3,900 (–3 dB) wit 400 using carrier free	h Linear Phase filter, quency and bessel filter	
Active low-pass filter		Bessel, Butterworth, I	Linear phase, Filter OFF	
Transducer identification (TEDS, IEEE 1451.4) max. distance of the TEDS module	m	1	00	
Transducer connection		Phoenix Contact FMC-1,5/8-ST-3,5-RF push-in termi Plug included		
Supply voltage range (DC)	V	10 30 (24 V nominal (rated) voltage)		
Supply voltage interruption		max. 5 ms at 24 V		
Power consumption	W	< 12		
Ethernet (data link)		10Base-1 / 100Base-1X		
Connection	-	PPC plug (P L 45) with twisted pair cable (CAT 5)		
Max. cable length to module	m	100		
Synchronization options EtherCAT ^{®1)} IRIG-B (B000 to B007; B120 to B127) IEEE1588 (PTPv2), NTP		IEEE1394b FireWi via C via MX440B - or MX Fthernet based T	re (only QuantumX) X27B K840B input channel ime Sync Protocol	
IEEE1394b FireWire (module synchronization, data link, optional supply voltage)		IEEE 1394b (HBM modules only)		
Baud rate	MBaud	400 (approx	. 50 MByte/s)	
Max. current from module to module	А	1	.5	
Max. cable length between the nodes	m	5 (opric	al: 100)	
Max. number of modules connected in series (daisy chain)	-	12 (=1	1 hops)	
Max. number of modules in a IEEE1394b FireWire system (including hubs ²⁾ , backplane)	-	2	24	
Max. number of nops ^o		1	4	
Nominal (rated) temperature range		-20 +65	[-4 + 149]	
Storage temperature range		-40 +75	-40 +167]	
Rei. numidity	%	5 95 (non	condensing)	
Protection class		II ID00 mar		
Degree of protection		IP20 per	EN 60529	
Mechanical tests*/	m /o2			
Shock (6 ms)	m/s ²	50		
FMC requirements	11/3	300		
Max input voltage at transducer socket to ground		por Err		
transient free				
Pin 6 and 7 to Pin 1, 2, 3, 4 or 5	V	±	18	
Dimensions, horizontal (W x H x D)	mm	52.5 x 200 x 122 (v 44 x 174 x 119 (with	vith case protection) nout case protection)	
Weight, approx.	g	9	80	

1) EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany

2) Hub: IEEE1394b FireWire node or distributor

4) Mechanical stress is tested according to European Standard EN60068-2-6 for vibrations and EN60068-2-27 for shock. The equipment is subjected to an acceleration of 50 m/s² in a frequency range of 5...65 Hz in all 3 axes. Duration of this vibration test: 30min per axis. The shock test is performed with a nominal

acceleration of 350 m/s² for 6 ms, half sine pulse shape, with 3 shocks in each of the 6 possible directions. ⁵⁾ The DC voltage supply must meet the requirements of IEC 60950–1 on a SELV voltage supply.

³⁾ Hop: Transition from module to module or signal conditioning / distribution via IEEE1394b FireWire (hub, backplane)

Strain gauge fuil of nan bridge, bridge excitation: carrier requency						
Accuracy class		0.05 1)				
Carrier frequency (square)	Hz	1,200 ±2				
Bridge excitation voltage (effective)	V	1; 2.5; 5 (±5 %)				
Transducers that can be connected		Strain gauge full and half bridges				
Permissible cable length between module and transducer	m	< 100				
Measuring ranges at 5 V excitation at 2.5 V excitation at 1 V excitation	mV/V mV/V mV/V	$\begin{array}{c} \pm 4 \\ \pm 8 \\ \pm 20 \end{array}$				
Additional shunt resistor can be activated (control signal)	kΩ	100±0,1% ²⁾ (typ. – 0.886 mV/V at 350 Ω)				
Transducer impedance at 5 V excitation at 2.5 V excitation at 1 V excitation	Ω Ω Ω	300 1,000 300 1,000 80 1,000				
Noise at 25 °C and 2.5 V excitation (peak to peak) with filter 1 Hz Bessel with filter 10 Hz Bessel with filter 100 Hz Bessel	μV/V μV/V μV/V	< 0.2 < 0.5 < 1.5				
Linearity error	%	< 0.02 of full scale				
Zero drift (Full bridge with 5 V excitation)	% / 10 K	< 0.01 ¹⁾ of full scale				
Full-scale drift (5 V excitation)	% / 10 K	< 0.05 of measurement value				

¹⁾ 0.5 with half bridge (Linearity error < 0.02 %)

²⁾ When using a half bridge, the shunt resistor may only be used when signals 1 (Pin 6) and 4 (Pin 7) are bridged (in this case, control signal: typ. + 0.873 mV/V at 350 Ω).

Strain gauge full or half bridge, bridge excitation: DC voltage					
Accuracy class		0.1 ¹⁾			
Bridge excitation voltage (DC)	V	1; 2.5; 5; (±5 %)			
Transducers that can be connected		strain gauge half and full bridges			
Permissible cable length between module and transducer	m	< 100			
Measuring ranges at 5 V excitation at 2.5 V excitation at 1 V excitation	mV/V mV/V mV/V	$\begin{array}{c} \pm 4 \\ \pm 8 \\ \pm 20 \end{array}$			
Additional shunt resistor can be activated (control signal)	kΩ	100 ± 0,1% ²⁾ (typ. – 0.886 mV/V at 350 Ω)			
Transducer impedance at 5 V excitation at 2.5 V excitation at 1 V excitation	Ω Ω Ω	300 1,000 ³⁾ 300 1,000 ³⁾ 80 1,000 ³⁾			
Noise at 25 °C and 2.5 V excitation (peak to peak) with filter 1 Hz Bessel with filter 10 Hz Bessel with filter 100 Hz Bessel with filter 1 kHz Bessel	μV/V μV/V μV/V μV/V	< 0.2 < 0.4 < 1 < 3			
Linearity error	%	< 0.02 of full scale			
Zero drift (Full bridge with 5 V excitation)	% / 10 K	< 0.1 ¹⁾ of full scale			
Full-scale drift (5 V excitation)	% / 10 K	< 0.05 of measurement value			

¹⁾ with 10 V/m electromagnetic field strength (EN61000-4-3) : 0.2

2) When using a half bridge, the shunt resistot may only be used when signals 1 (Pin 6) and 4 (Pin 7) are bridged (in this case, control signal: typ. + 0.873 mV/V at 350 Ω). ³⁾ A higher transducer impedance is possible (< 5 k Ω). This merely results in a higher zero error and thus an accuracy class of 0.3.

Strain gauges quarter bridge, bridge excitation: carrier frequency ¹⁾						
Accuracy class		0.1				
Carrier frequency (square)	Hz	1,200±2				
Bridge excitation voltage (effective)	V	0.5; 1; 2.5; 5 (±5 %)				
Transducers that can be connected		SG quarter bridge in four wire circuit and three wire circuit				
Permissible cable length between module and transducer	m	< 100				
Measuring ranges at 5 V excitation (only at 350 Ohm strain gauge) at 2.5 V excitation at 1 V excitation at 0.5 V excitation	mV/V mV/V mV/V mV/V					
Additional shunt resistor can be activated (control signal)	kΩ	100 ± 0,1% (typ. + 0.873 mV/V at 350 Ω)				
Internal completion resistors	Ω	120 and 350				
Noise at 25 °C and 5 V excitation (peak to peak) with filter 1 Hz Bessel with filter 10 Hz Bessel with filter 100 Hz Bessel	μV/V μV/V μV/V	< 0.3 < 0.6 < 1.5				
Linearity error ²⁾	%	< 0.05 of full scale				
Zero drift ²⁾ (5 V excitation)	% / 10 K	< 0.1 of full scale				
Full-scale ²⁾ drift (5 V excitation)	% / 10 K	< 0.1 of measurement value				

¹⁾ Three-wire circuit with carrier frequency is supported from February 2017 or with re-calibration of older modules

 $^{2)}$ With 350 Ω resistor

Strain gauges quarter bridge, bridge excitation: DC voltage					
Accuracy class		0.1 ¹⁾			
Bridge excitation voltage (DC)	V	0.5; 1; 2.5; 5 (±5 %)			
Transducers that can be connected		SG quarter bridges in four wire circuit and three wire circuit			
Permissible cable length between module and transducer	m	< 100			
Measuring ranges					
at 5 V excitation (only at 350 Ohm strain gauge) at 2.5 V excitation at 1 V excitation at 0.5 V excitation	mV/V mV/V mV/V mV/V				
Additional shunt resistor can be connected (control signal)	kΩ	100±0,1% (typ. + 0.873 mV/V at 350 Ω)			
Internal completion resistors	Ω	120 and 350			
Noise ²⁾ at 25 °C and 5 V excitation (peak to peak) with filter 1 Hz Bessel with filter 10 Hz Bessel with filter 100 Hz Bessel with filter 1 kHz Bessel	μV/V μV/V μV/V μV/V	< 0.4 < 0.6 < 1.5 < 3			
Linearity error ²⁾	%	< 0.05 of full scale			
Zero drift ²⁾ (5 V excitation)	% / 10 K	<0.1 of full scale			
Full-scale ²⁾ drift (5 V excitation)	% / 10 K	< 0.05 of measurement value			

 with 10 V/m electromagnetic field strength (EN61000-4-3) : 0.2 The accuracy class does not take into account measurement errors resulting from asymmetrical cable resistances when using a three-wire circuit.

 $^{2)}$ With 350 Ω resistor and connection using a four-wire circuit.

Potentiometric transducer					
Accuracy class		0.1			
Excitation voltage (DC)	V	1 (±5 %)			
Transducers that can be connected		Potentiometric transducers (5-wire circuit)			
Permissible cable length between module and transducer	m	< 100			
Measuring range	mV/V	± 500			
Transducer impedance	Ω	100 50,000			
Noise at 25 °C (peak to peak) with filter 1 Hz Bessel with filter 10 Hz Bessel with filter 100 Hz Bessel with filter 1 kHz Bessel	μV/V μV/V μV/V μV/V	< 2 < 4 < 10 < 30			
Linearity error	%	< 0.05 of full scale			
Zero drift	% / 10 K	< 0.1 of full scale			
Full-scale drift	% / 10 K	< 0.1 of measurement value			

Voltage ± 10 V (DC)		
Accuracy class		0.05
Transducers that can be connected		Voltage transmitter \pm 10 V
Permissible cable length between module and transducer	m	< 100
Measuring range	V	\pm 15 differential
Internal resistance of the connected voltage source	Ω	< 500
Input impedance (symmetrical)	MΩ	> 1.5
Noise at 25 °C (peak to peak) at 1 Hz Bessel filter at 10 Hz Bessel filter at 100 Hz Bessel filter at 1 kHz Bessel filter	μV μV μV μV	150 300 600 2,000
Linearity error	%	< 0.02 of full scale
Common-mode rejection at DC common-mode at 50 Hz common-mode, typically	dB dB	> 100 75
Max. common-mode voltage Channel against housing and supply ground Channel against channel	V V	±60 ±5
Zero drift	% / 10 K	< 0.03 of full scale
Full-scale drift	% / 10 K	< 0.05 of measurement value

Resistance		
Accuracy class		0.1
Transducers that can be connected		PTC, NTC, KTY, TT-3, resistances generally (connection with four wire configuration)
Permissible cable length between module and transducer	m	< 100
Measuring range	Ω	0 1,000 ¹⁾
Excitation current	mA	0.37 1.43
Noise at 25 °C (peak to peak) with filter 1 Hz Bessel with filter 10 Hz Bessel with filter 100 Hz Bessel with filter 1 kHz Bessel	Ω Ω Ω	< 0.1 < 0.2 < 0.5 < 1.5
Linearity error	%	< 0.05 of full scale
Zero drift	% / 10 K	< 0.02 of full scale
Full-scale drift	% / 10 K	< 0.1 of measurement value

^) Measuring range can be modulated up to 5 k $\Omega\!\!$, in this case: accuracy class 2

Resistance thermometer (PT100)					
Accuracy class		0.1			
Transducers that can be connected		PT100 (connection with four wire configuration)			
Permissible cable length between module and transducer	m	< 100			
Linearization range	°C [°F]	-200 +848 [-328 +1,558.4]			
Excitation current	mA	0.67 1.36			
Noise at 25 °C (peak to peak) with filter 1 Hz Bessel with filter 10 Hz Bessel with filter 100 Hz Bessel with filter 1 kHz Bessel	к к к к	< 0.02 < 0.04 < 0.1 < 0.3			
Linearity error	К	<±0.3			
Zero drift	K / 10 K	< 0.2			
Full-scale drift	K / 10 K	< 0.5			

Тур	-1dB (Hz)	-3dB (Hz)	-20dB (Hz)	Phase delay ^{*)} (ms)	Rise time (ms)	Overshoot (%)	Rate (Hz)
	1,203	2,000	3,830	0.113	0.189	2.10	20,000
	596	1,000	2,494	0.256	0.355	1.0	20,000
	298	502	1,278	0.581	0.701	0.9	20,000
	119	200	509	1.56	1.76	0.9	20,000
	59	100	254	3.21	3.51	0.9	20,000
	29.6	49.9	127.1	6.50	7.01	0.9	20,000
sel	11.8	20.0	50.8	16.4	17.6	0.9	20,000
Bes	5.9	10.0	25.4	32.9	35.1	0.9	20,000
	2.96	4.99	12.70	69.0	70.1	0.9	10,000
	1.18	2.00	5.08	168	176	0.9	10,000
	0.59	1.00	2.54	333	351	0.9	5,000
	0.295	0.498	1.271	663	701	0.9	1,000
	0.118	0.200	0.508	1,660	1,760	0.9	1,000
	0.059	0.100	0.254	3,300	3,510	0.9	500
	0.0295	0.0498	0.1271	6,620	7,010	0.9	100
	0.0118	0.0200	0.0508	16,500	17,600	0.9	100
	0.0059	0.0100	0.0254	33,000	35,100	0.9	50

Decimal sample rates and digital low pass filter, type Bessel 4th order

*) The analog-to-digital converter's delay time is 128 μs for all data rates and has not been accounted for in the "Phase delay" column! The anti-aliasing filter's delay time (160 μs) is not accounted for as well. Hence 288 μs need to be added to the "Phase delay".

Decimal sample rates : Amplitude response Bessel filter



Decimal sample rates and digital low pass filter, type Butterworth 4th order

Тур	-1dB (Hz)	-3dB (Hz)	-20dB (Hz)	Phase delay ^{*)} (ms)	Rise time (ms)	Overshoot (%)	Rate (Hz)
	2,612	3,000	4,316	0.162	0.161	16.1	20,000
	1,703	2,000	3,600	0.234	0.211	12.7	20,000
	838	1,000	1,746	0.465	0.394	11.2	20,000
	430	500	890	0.914	0.778	11.0	20,000
	169	200	355	2.27	1.94	11.0	20,000
_	84	100	178	4.51	3.88	11.0	20,000
orth	42.2	50.0	88.8	9.00	7.75	11.0	20,000
er v	16.9	20.0	35.5	22.5	19.4	11.0	20,000
Butt	8.4	10.0	17.8	45	38.8	11.0	20,000
ш	4.22	5.00	8.88	90	77.5	11.0	20,000
	1.68	2.00	3.55	225	194	11.0	20,000
	0.84	1.00	1.78	449	387	11.0	20,000
	0.423	0.500	0.888	898	774	11.0	10,000
	0.169	0.200	0.356	2,250	1,940	11.0	10,000
	0.084	0.100	0.178	4,490	3,870	11.0.	5,000
	0.0422	0.0500	0.0888	8,980	7,740	11.0	1,000
	0.0168	0.0200	0.0356	22,500	19,400	11.0	1,000
	0.0085	0.0100	0.0178	44,900	38,700	11.0	500

*) The analog-to-digital converter's delay time is 128 μs for all data rates and has not been accounted for in the "Phase delay" column! The anti-aliasing filter's delay time (160 μs) is not accounted for as well. Hence 288 μs need to be added to the "Phase delay".

Decimal sample rates : Amplitude response Butterworth filter



Туре	Start of Roll-off (Hz)	-3dB (Hz)	-20dB (Hz)	Phase delay ^{*)} (ms)	Rise time (ms)	Overshoot (%)	Rate (Hz)
	3,333	3,900	4,580	0.802	0.117	8.6	20,000
	1,667	2,100	2,694	2.41	0.274	8.6	5,000
	1,000	1,130	1,308	6.21	0.544	8.6	2,500
se	833	1.050	1,346	4.01	0.551	8.6	2,500
² ha:	667	838	1,078	4.80	0.694	8.6	1,000
ear F	333	420	539	10.4	1.39	8.6	1,000
Line	167	210	269	26.9	2.73	8.6	500
	67	84	108	50.2	6.88	8.6	200
	33	42	54	108	13.8	8.6	100

Decimal sample rates : active low pass filter MX1615B Linear Phase (FIR)

*) The analog-to-digital converter's delay time is 128 μs for all data rates and has not been accounted for in the "Phase delay" column! The anti-aliasing filter's delay time (160 μs) is not accounted for as well. Hence 288 μs need to be added to the "Phase delay".

Decimal sample rates : Amplitude response of MX1615B, Linear Phase (FIR)



Туре	-1 dB (Hz)	-3dB (Hz)	-20dB (Hz)	Phase delay ^{*)} (ms)	Rise time (ms)	Overshoot (%)	Rate (Hz)
Butterworth	1,384	1,500	1,887	3.48	0.346	18.7	10,000
	698	750	924	5.56	0.682	18.7	5,000
	344	370	471	14.1	1.40	18.7	2,500
	275	300	377	17.3	1.75	18.7	2,000
	140	150	185	27.6	3.41	18.7	1,000
	69	75	94	71.8	6.97	18.7	500
	28	30	37	139	17.0	18.7	200
	14	15	19	358	34.9	18.7	100

Decimal sample rates : active low pass filter MX1615B, Butterworth filter (FIR)

*) The analog-to-digital converter's delay time is 128 μs for all data rates and has not been accounted for in the "Phase delay" column! The anti-aliasing filter's delay time (160 μs) is not accounted for as well. Hence 288 μs need to be added to the "Phase delay".

Decimal sample rates : Amplitude response of MX1615B, Butterworth filter (FIR)



Туре	-1dB (Hz)	-3dB (Hz)	-20dB (Hz)	Phase delay (ms) ^{*)}	Rise time (ms)	Overshoot (%)	Rate (Hz)
	1,000	1,575	3,611	0.11	0.2	1.4	19,200
	500	812	2,079	0.3	0.38	1.3	9,600
	200	335	860	0.9	1.05	0.8	9,600
	100	168	427	1.8	2.11	0.8	9,600
	50	84	213	3.9	4.18	0.8	9,600
sel	20	33.7	85	9.5	10.4	0.8	9,600
Bes	10	16.6	43	19.5	21.0	0.8	9,600
	5	8.4	21	39	41.4	0.8	2,400
	2	3.4	8.6	97	102	0.8	2,400
	1	1.6	4.2	197	215	0.8	2,400
	0.5	0.84	2.1	390	418	0.8	300
	0.2	0.34	0.85	980	1,033	0.8	300
	0.1	0.17	0.43	1,950	2,090	0.8	300
	0.05	0.085	0.21	3,860	4,170	0.8	20
	0.02	0.036	0.088	9,800	10,560	0.8	20
	0.01	0.017	0.044	19,500	21,200	0.8	20

Classic HBM sample rates and digital low pass filter, type Bessel 4th order

*) The analog-to-digital converter's delay time is 128 μs for all data rates and has not been accounted for in the "Phase delay" column! The anti-aliasing filter's delay time (160 μs) is not accounted for as well. Hence 288 μs need to be added to the "Phase delay".

Classic HBM sample rates : Amplitude response Bessel filter



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Туре	-1dB (Hz)	-3dB (Hz)	-20dB (Hz)	Phase delay (ms) ^{*)}	Rise time (ms)	Overshoot (%)	Rate (Hz)
	2,000	3,053	5,083	0	0.144	8.5	19,200
	1,000	1,170	2,077	0.27	0.344	11.0	19,200
	500	587	1,048	0.64	0.652	11.0	9,600
	200	237	420	1.76	1.64	11.0	9,600
_	100	118	210	3.65	3.28	11.0	9,600
orth	50	59	105	7.49	6.29	11.0	9,600
No No	20	24	42	18.8	16.15	11.0	9,600
Butte	10	12	21	37.7	32.29	11.0	9,600
	5	5.95	10.5	74.9	65.92	11.0	2,400
	2	2.37	4.24	188	163.6	11.0	2,400
	1	1.26	2.12	370	315	11.0	2,400
	0.5	0.59	1.05	756	656	11.0	300
	0.2	0.241	0.419	1,900	1,640	11.0	300
	0.1	0.122	0.210	3,770	3,280	11.0	300
	0.05	0.060	0.106	7,490	6,596	11.0	20
	0.02	0.0245	0.042	18,900	16,200	11.0	20
	0.01	0.012	0.021	37,700	32.383	11.0	20

Classic HBM sample rates and digital low pass filter, type Butterworth 4th order

 *) The analog-to-digital converter's delay time is 128 μs for all data rates and has not been accounted for in the "Phase delay" column! The anti-aliasing filter's delay time (160 μs) is not accounted for as well. Hence 288 μs need to be added to the "Phase delay".

Classic HBM sample rates : Amplitude response Butterworth filter



Specifications Power pack NTX001

NTX001		
Nominal input voltage (AC)	V	100 240 (±10%)
Stand-by power consumption at 230 V	W	0.5
Nominal load		
U _A	V	24
I _A	A	1.25
Static output characteristics		
U _A	V	$24 \pm 4\%$
I _A	Α	0 – 1.25
U _{Br} (Output voltage ripple; peak to peak)	mV	≤120
Current limiting, typically from	А	1.6
Primary – secondary separation		galvanically, by optocoupler and converter
Creep distance and clearance	mm	≥8
High-voltage test	kV	≥4
Ambient temperature range	°C [°F]	0 +40 [+32 +104]
Storage temperature	°C [°F]	-40 +70 [-40 +158]

Accessories, to be ordered separately

MX1615B accessories					
Article	Description	Order No.			
Voltage supply					
AC-DC power supply / 24 V	Input : 100 240 V AC (±10%), 1.5 m cable Output: 24 V DC, max. 1.25 A, 2 m cable with ODU connector	1-NTX001			
3m cable – QuantumX supply	3 m cable for voltage supply of QuantumX modules; Suitable plug (ODU Medi-Snap S11M08-P04MJGO-5280) on one side and open strands on the other end.	1-KAB271-3			
Communication					
Ethernet cross over cable	Ethernet cross over cable for direct operation between a PC or Notebook and a module / device, length 2 m, type CAT5+	1-KAB239-2			
IEEE1394b FireWire cable (module-to-module)	FireWire connection cable for QuantumX or SomatXR-modules; with matching plugs on both sides. Length 0.2 m/2 m/5 m Note: The cable enables modules to be supplied with power (max. 1.5 A, from the source to the last drain).	1-KAB272-0.2 1-KAB272-2 1-KAB272-5			
IEEE1394b IEEE1394b FireWire IEEE ExpressCard	FireWire IEEE 1394b ExpressCard (ExpressCard/34) to connect QuantumX modules to a notebook or PC	1-IF002			
IEEE1394b FireWire cable PC-to-module	Firewire connection cable between module and PC. With matching plugs on both sides; Length: 3 m. No voltage supply of the modules possible via KAB293.	1-KAB293-5			
IEEE1394b FireWire cable from hub to module, IP68	FireWire connection cable between HUB and module. For data transfer from QuantumX modules to the HUB. Fitted with suitable plugs at both ends. Length: 3 m	1-KAB276-3			
IEEE1394b FireWire Extender SCM-FW	Package including 2 in-line elements for extension of the FireWire connection up to 40 m; Required parts: 2 x 1-KAB269-x and Industrial Ethernet cable (M12, CAT5e. No voltage supply of the modules possible via KAB270.	1-SCM-FW			

Specifications Power pack NTX001

MX1615B accessories					
Article	Description	Order No.			
Mechanic					
Connecting elements for QuantumX modules	Connecting elements (clips) for QuantumX modules; Set comprising 2 case clips including mounting material for fast connection of 2 modules.	1-CASECLIP			
Fitting panel for QuantumX modules	Fitting panel for mounting of QuantumX modules using case clips (1–CASECLIP), lashing strap or cable tie. Basic fastening by 4 screws.	1-CASEFIT			
QuantumX backplane (Standard)	QuantumX backplane – Standard for a maximum of 9 modules, IP 20 version; – Mounting on wall or control cabinet (19") - Connection of external modules by FireWire possible; - Power supply: 24 V DC / max. 5 A (150 W);	1-BPX001			
QuantumX Backplane	QuantumX Backplane – Rack for maximum 9 modules in IP 20; - 19" rack mounting with handles left and right; - Connection of external modules via FireWire possible; - Power supply: 24 V DC / max. 5 A (150 W).	1-BPX002			
Transducer side					
Push-In connector (8 Pins), Gold	10 push-In-connectors, Phoenix Contact, 8 pins Gold	1-CON-S1015			
1-Wire-EEPROMS	Package of 10 pieces of 1-wire EEPROMS DS24B33 (IEEE1451.4 TEDS)	1-TEDS-PAK			

Accessories, to be ordered separately (continued)

General accessories					
Article	Description	Order No.			
Software and product packages					
catman [®] AP catman [°] PostProcess	Complete package including catman [®] Easy functionality plus additional modules such as integration of video cameras (EasyVideoCam), complete post-process analysis (EasyMath), automation of recurring processes (EasyScript), offline preparation of measurement projects (EasyPlan) as well as additional functions such as calculating electrical power, special filters, frequency spectrum, etc. More details at www.hbm.com\catman\	1-CATMAN-AP			
catman [®] EASY Catman [®] PostProcess	The basic software package for measurement data acquisition comprises convenient channel parameterization using TEDS or the sensor database, measurement job parameterization, individual visualization, data storage and reporting.	1-CATMAN-EASY			
catman [®] PostProcess catman [®] PostProcess	Post Process edition for visualization, preparation and analysis of measurement data, including many mathematical functions, data export and reporting.	1-CATEASY-PROCESS			
MX1615B + catman [®] EASY	Package including: - MX1615B amplifier (1-MX1615B) - Power supply (1-NTX001) - 16 transducer plugs - Ethernet Cross-over cable (1-KAB239-2) - catman⊛Easy software from HBM (1-CATMAN-EASY) - Including software maintenance for the first 12 months	1-MX1615-PAKEASY			
MX1615B + catman [®] AP	Package including: - MX1615B amplifier (1-MX1615B) - Power supply (1-NTX001) - 16 transducer plugs - Ethernet Cross-over cable (1-KAB239-2) - catman®AP software from HBM (1-CATMAN-AP) - Including software maintenance for the first 12 months	1-МХ1615-РАКАР			
LabVIEW TM -driver ¹⁾	Universal driver from HBM for LabVIEW TM .	1-LabVIEW-DRIVER			
CANape [®] driver	QuantumX driver for CANape [®] software from Vector Informatik. CANape versions from 10.0 are supported.	1-CANAPE-DRIVER			

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Subject to modifications.

All product descriptions are for general information only. They are not to be understood as a guarantee of quality or durability. Hottinger Baldwin Messtechnik GmbH Im Tiefen See 45 64293 Darmstadt · Germany Tel. +49 6151 803-0 Fax +49 6151 803-9100 Email: info@hbm.com · www.hbm.com

