

Bill of materials

Table 1. STDES-8PIOLM4P bill of materials

Item	Q.ty	Ref.	Value	Description	Manufacturer	Order code
1	2	B1, B2	KEY3	Switch Tactile N.O. SPST Button	ALPS	SKRKAEE020
2	6	C1, C2, C10, C11, C70, C71	0402_C	Cap Ceramic 18pF 50V CG 5% Pad SMD 0402 125°C T/R	Murata	GJM1551C1H180JB01#
3	51	C3, C4, C5, C6, C7, C8, C9, C12, C13, C14, C15, C16, C17, C18, C19, C21, C22, C23, C28, C29, C40, C43, C54, C56, C57, C58, C59, C60, C61, C64, C66, C68, C69, C78, C85, C133, C137, C139, C140, C141, C142, C143, C144, C145, C146, C147, C148, C149, C150, C154, C155	0402_C	Cap Ceramic 0.1uF 50V X7S 10% Pad SMD 0402 125°C T/R	Murata	GRM155C71H104KE19#
4	1	C20	0402_C	Cap Ceramic 470pF 100V X7R 20% Pad SMD 0402 125°C T/R	Murata	GRM155R72A471MA01#
5	4	C24, C30, C131, C132	0402_C	Cap Ceramic 6pF 50V CG 5% Pad SMD 0402 125°C T/R	Murata	GJM1551C1H60JB01#
6	1	C25	1206_C	Cap Ceramic 0.001uF 1000V C0G 5% Pad SMD 1206 125°C T/R	Murata	GRM31C5C3A102JWA3#
7	8	C26, C42, C44, C45, C46, C47, C48, C156	0603_C	Cap Ceramic 10uF 10V X7R 20% Pad SMD 0603 125°C T/R	Murata	GRM188Z71A106MA73#
8	5	C27, C39, C41, C67, C136	0402_C	Cap Ceramic 1uF 10V X7S 20% Pad SMD 0402 125°C T/R	Murata	GRM155C71A105ME11#
9	1	C31	D3.5/8MM	Cap Aluminum Lytic 100uF 50V 20% (8 X	KEMET	ESL107M050AGMAA



11.5mm Radial 3.5mm Art 2 0.5mm Art 2 0.5mm Art 2 0.5mm Art 2 0.5mm Art 100000 105° C 888 100000 100° C 888 1000000 100° C 888 1000000 125° C 100° C	Item	Q.ty	Ref.	Value	Description	Manufacturer	Order code
10					11.5mm) Radial 3.5mm 0.12 Ohm 725mA 10000h 105°C		
11	10	12	C77, C81, C84, C91, C98, C105, C112, C119,	1206_C	Ceramic Capacitor,	Murata	GRM31CD71H106KE11#
1	11	1	C33	0603_C	0.22uF 50V X7R 10% Pad SMD 0603	Murata	GRM188R71H224KAC4#
14	12	1	C34	D3.5/8MM	Lytic 68uF、	Any	
14	13	1	C35	0402_C	12nF	Murata	GMD155R11E123KA01#
Cap Ceramic 10uF 10V X7T 10% Pad SMD 10003 125°C T/R 10uF 10V X7T 10% Pad SMD 10003 125°C T/R 10uF 10V X7T 10% Pad SMD 10003 125°C T/R 10uF 10V X7T 10% Pad SMD 10003 125°C T/R 10uF 10V X7T 10% Pad SMD 10uF 10V X7T 10% Pad SMD 10uF 10V X7T 10% Pad SMD 10uF 10V X7S 10wF Pad SMD 10uF 10	14	1	C36	0402_C	0.0015uF 50V C0G 2% Pad SMD 0402	Murata	GRM1555C1H152GA01#
16	15	1	C37	0402_C	68nF	Murata	GMD155R11C683KA11#
18 32 C72, C73, C76, C79, C80, C82, C83, C86, C89, C90, C92, C93, C96, C97, C100, C103, C114, C117, C118, C120, C121, C124, C125, C127, C128 19 16 C108, C109, C109, C109, C109, C100, C102, C104, C106, C122, C123, C129, C130 20 2 C134, C135 0402_C 4.7. C4.7. C4.7	16	5		0603_C	10uF 10V X7T 10% Pad SMD	Murata	GRM188D71A106KA73#
18	17	4		0603_C	4.7uF/6.3V	Murata	GRM185D70J475ME11#
C88, C94, C95, C101, C102, C101, C102, C108, C109, C115, C116, C122, C123, C129, C130 C134, C135 C134, C135 C134, C135 C134, C135 C134, C135 C135, C126, C127, C12	18	32	C79, C80, C82, C83, C86, C89, C90, C92, C93, C96, C97, C99, C100, C103, C104, C106, C107, C110, C111, C113, C114, C117, C118, C120, C121, C124, C125, C127,	0402_C	0.1uF 50V X7S 10% Pad SMD	Murata	GRM155C71H104KE19#
20 2 C134, C135 0402_C Ceramic Multilayer (MLCC) Murata GRM155Z71A225KE01#	19	16	C88, C94, C95, C101, C102, C108, C109, C115, C116, C122, C123,	0402_C	560pF	Murata	GRM1552C1H561GA01#
21 1 C151 0402_C Any	20	2	C134, C135	0402_C	Ceramic Multilayer	Murata	GRM155Z71A225KE01#
	21	1	C151	0402_C		Any	

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Item	Q.ty	Ref.	Value	Description	Manufacturer	Order code
22	2	C152, C153	0402_C	Cap Ceramic 8pF 50V CG 5% Pad SMD 0402 125°C T/R	Murata	GJM1551C1H80JB01#
23	1	CN1	RJ45-E5J88-14L0D2- L	Conn RJ-45 F 8 POS Solder RA Thru-Hole	Pulse	E5J88-14L0D2-L
24	1	D1	TO-227A	Rectifier Diode Schottky 45V 10A 3- Pin(2+Tab) PSMC T/R	ST	STPS1045SF
25	1	D2	SMC(DO-214AB)_S1	TVS Diode Single Bi-Dir 28.2V 1.5KW 2- Pin SMC T/R	ST	SM15T33CA
26	1	D3	SMA(DO-214AC)_S1	Rectifier Diode Schottky 40V 3A 2-Pin SMA flat T/R	ST	STPS340AFN
27	3	D4, D5, D15	SOD-123	Rectifier Diode Schottky 20V 0.5A 2-Pin SOD-123 T/R	ST	STPS0520Z
28	8	D6, D7, D8, D9, D10, D11, D12, D14	SOD-123	Zener Diode Single 6.8V 5% 5Ohm 500mW 2-Pin SOD-123 T/R	ON	MMSZ5235BT1G
29	2	ESD1, ESD2	SOT23-6L	ESD Suppressor Diode TVS Bi- Dir 5V 6-Pin SOT-23 T/R	ST	ESDA6V1BC6
30	1	F1	F6.1X2.7	Fuse Chip Slow Blow Acting 8A 75V SMD Solder Pad 6.1 X 2.69mm Ceramic T/R CSA/UL	Littelfuse	0452008.MRL
31	1	FB0	1206_L		Any	
32	1	FB1	0603_L	Ferrite Beads Multi-Layer 120Ohm 25% 100MHz 0.8A 0.18Ohm DCR 0603 Automotive T/R	Murata	BLM18AG121SZ1D
33	11	FB2, FB3, FB4, FB5, FB6, FB7, FB9, FB10, FB12, FB13, FB17	0603_L		Any	
34	1	FB8	1206_L	Ferrite Beads Multi-Layer Power 50Ohm 25% 100MHz 12A 0.0016Ohm	Murata	BLM31SN500SH1L

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Item	Q.ty	Ref.	Value	Description	Manufacturer	Order code
				DCR 1206 Automotive T/R		
35	1	FB11	0603_L	Ferrite Beads Multi-Layer 1200hm 25% 100MHz 0.5A 0.250hm DCR 0402 Automotive T/R	Murata	BLM15AG121SH1D
36	2	FB14, FB15	0402_L		Any	
37	1	FB16	0402_L		Any	
38	1	J1	CUI-PJ-080BH	2.5 x 6.4 mm, 10.0 A, Horizontal, Through Hole, Shielded, Dc Power Jack Connector	CUI Devices	PJ-080BH
39	2	J2, J3	MICRO USB 1050170002	Conn Micro USB 2.0 Type B RCP 5 POS 0.65mm Solder RA SMD 5 Terminal 1 Port T/R	Molex	1050170002
40	1	L1	L8080	Inductor Power Shielded Wirewound 22uH 20% 100KHz Ferrite 2.8A 0.0744Ohm DCR 3131 T/R	Murata	1267AY-220M#
41	11	LD1, LD4, LD5, LD7, LD9, LD11, LD13, LD15, LD17, LD19, LD21	0603_LED_S1	RED LED	Any	
42	9	LD2, LD3, LD6, LD8, LD10, LD12, LD14, LD16, LD18	0603_LED_S1	GREEN LED	Any	
43	1	LD20	0603_LED_S1	BLUE LED	Any	
44	8	M1, M2, M3, M4, M5, M6, M7, M8	M12	Conn M12 Circular F 5 POS Solder ST Thru-Hole 5 Terminal 1 Port	Amphenol	M12A-05PMMC-SF8B20
45	1	P1	HDR1X3	Header 3	Any	
46	3	P2, P4, P5	HDR_1x6_2R54_V_ M	Header 6	Any	
47	2	P3, P6	HDR1X3	77311-118-03LF	Any	77311-118-03LF
48	2	P7, P8	FCI_10129380_03	10129380-9030 02BLF	Any	
49	2	R1, R30	0402_R	0R	Any	10129380-903002BLF

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Item	Q.ty	Ref.	Value	Description	Manufacturer	Order code
50	12	R2, R3, R4, R5, R14, R17, R31, R32, R33, R34, R43, R46	0402_R	3.3ΚΩ	Any	
51	16	R6, R7, R8, R9, R10, R11, R12, R13, R35, R36, R37, R38, R39, R40, R41, R42	0402_R	470Ω	Any	
52	21	R15, R45, R91, R96, R97, R117, R118, R129, R130, R141, R142, R153, R154, R165, R166, R178, R179, R190, R191, R221, R230	0402_R	2.2ΚΩ	Any	
53	4	R16, R24, R44, R47	0402_R	4.7ΚΩ	Any	
54	84	R18, R19, R20, R21, R22, R23, R25, R26, R27, R28, R48, R49, R81, R82, R83, R84, R89, R90, R101, R102, R103, R105, R106, R107, R108, R109, R111, R112, R122, R123, R124, R134, R135, R136, R146, R147, R148, R158, R159, R160, R170, R171, R172, R174, R183, R184, R185, R195, R196, R197, R204, R207, R208, R209, R211, R214, R215, R217, R218, R219, R220, R222, R223, R224, R225, R226, R227, R228, R229, R231, R232, R233, R234, R235, R236, R237, R238, R239, R240, R241, R242, R243, R244	0402_R	0Ω	Any	
55	2	R29, R50	0402_R	10Ω	Any	
56	34	R51, R52, R53, R60, R68, R71,	0402_R	10ΚΩ	Any	

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Item	Q.ty	Ref.	Value	Description	Manufacturer	Order code
		R74, R95, R98, R99, R100, R115, R119, R120, R127, R131, R132, R140, R143, R144, R151, R155, R156, R163, R167, R168, R169, R177, R180, R181, R188, R192, R193, R199				
57	4	R54, R55, R56, R57	0402_R	50Ω	Any	
58	4	R58, R59, R66, R69	0402_R	33Ω	Any	
59	4	R61, R62, R63, R64	0402_R	75Ω	Any	
60	5	R65, R85, R86, R88, R92	0402_R	12ΚΩ	Any	
61	1	R67	0402_R	1.5ΚΩ	Any	
62	2	R70, R72	0402_R	270Ω	Any	
63	11	R73, R121, R133, R145, R157, R182, R194, R200, R202, R205, R206	0402_R	NC	Any	
64	1	R75	0402_R	200ΚΩ	Any	
65	1	R76	0402_R	110Ω	Any	
66	1	R77	0402_R	5.1ΚΩ	Any	
67	1	R78	0402_R	910Ω	Any	
68	1	R79	0402_R	698Ω	Any	
69	4	R80, R87, R113, R210	0402_R	1ΚΩ	Any	
70	16	R93, R94, R114, R116, R126, R128, R138, R139, R150, R152, R162, R164, R175, R176, R187, R189	0603_R	0Ω	Any	
71	8	R104, R125, R137, R149, R161, R173, R186, R198	0402_R	124ΚΩ	Any	
72	1	R201	0402_R	100ΚΩ	Any	
73	1	R203	0402_R	680Ω	Any	
74	1	R212	0402_R	330Ω	Any	
75	1	R213	0402_R	100Ω	Any	

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ltem	Q.ty	Ref.	Value	Description	Manufacturer	Order code
76	1	R216	0402_R	220ΚΩ	Any	
77	6	TP1, TP2, TP3, TP4, TP5, TP6	TP		Any	
78	1	TP7	TP	USB_SOF	Any	
79	1	TVS1	SMC(DO-214AB)_S1	TVS Diode Single Uni-Dir 28.2V 1.5KW 2- Pin SMC T/R	ST	SM15T33A
80	1	TVS2	LL-34	ZMM5V6	ON	ZMM5V6
81	2	U1, U3	LQFP-64_10X10X05 P	MCU 32-bit ARM Cortex M4 RISC 128KB Flash 3.3V 64- Pin LQFP Tray	Arrow	ARW-IOLM4P-STM32L4
82	2	U2, U4	TSSOP-8_3X4.4X065 P	EEPROM Serial-I2C 256K-bit 32K x 8 2.5V/3.3V/5V 8-Pin TSSOP T/R	ST	M24256-BRDW6TP
83	1	U5	SOT23-6L	ESD Suppressor Diode Diode Array Uni-Dir 5.25V 6-Pin SOT-23 T/R	ST	USBLC6-4SC6
84	1	U6	TRANSFORMER	Telecom Transformer 2(1:1) 16 Terminal Gull Wing SMD	Pulse	HX1260NL
85	1	U7	VQFN24	PHY 1-CH 10Mbps/ 100Mbps 1.2V/ 2.5V/3.3V 24- Pin SQFN EP T/R	Microchip	LAN8742A-CZ-TR
86	1	U8	HSOP-8_1.27	Conv DC-DC 4.5V to 38V Synchronous Step Down Single-Out 0.6V to 38V 3A 8-Pin HSOP EP T/R	ST	L7986ATR
87	1	U9	SOT-223	LDO Regulator Pos 3.3V 1.3A 4-Pin(3+Tab) SOT-223 T/R	ST	LD1117S33TR
88	1	U10	SON95P300X300X10 0-7N	LDO Regulator Pos 3.3V 0.5A 6-Pin DFN EP T/R	ST	LD39050PU33R
89	1	U11	SOIC-8_150MIL	EEPROM Serial-Microwire 4K-bit 512 x 8/256 x 16 2.5V/ 3.3V/5V 8-Pin	ST	M93C66-RMC6TG

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Item	Q.ty	Ref.	Value	Description	Manufacturer	Order code
				UFDFPN EP T/R		
90	1	U12	VQFN56-0.5	High Speed USB to UART/ FIFO USB 2.0 1.8V/3.3V Tray 56-Pin VQFN EP	FTDI	FT2232H-56Q-TRAY
91	8	U13, U15, U18, U20, U22, U24, U26, U28	VFQFPN_26L	Transceiver 1TX 1RX 400Kbps 26-Pin VFQFPN EP T/R	ST	L6360TR
92	8	U14, U17, U19, U21, U23, U25, U27, U29	QFN_3X3_6+3LEAD _STM - NEW	Automation Sensor Transient	ST	SPT01-335DEE
93	1	U16	POWERSO36	Current Limit SW 8-IN 8-OUT to 1.7A 36-Pin PowerSO Tube	ST	VN808CM-32-E
94	1	U30	LQFP144_0R5_SKT	MCU 32-bit ARM Cortex M7 RISC 1MB Flash 1.8V/ 2.5V/3.3V 144- Pin LQFP Tray	ST	STM32F746ZGT6
95	2	U31, U32	QFN16L	Analog Switch Quad SPDT 16- Pin QFN T/R	ST	STG3692QTR
96	2	X1, X2	SMD-3225_4P	Crystal 14.7456MHz ±20ppm (Tol) ±30ppm (Stability) 18pF FUND 80Ohm 4-Pin Ultra Mini- CSMD T/R	Abracom	ABM8G-14.7456MHZ-18- D2Y-T
97	1	Х3	SMD2016	Crystal 25MHz ±100ppm (Tol) ±100ppm (Stability) 6pF 150Ohm 4-Pin SMD T/R	Murata	XRCGB25M000F0Z00R0
98	1	X4	SMD3213	Ceramic Resonator 12MHz ±0.07% (Tol) ±0.11% (Stability) 33pF 30Ohm 3-Pin CSMD T/R	Murata	CSTNE12M0GH5L000R0
99	1	X5	SMD3213	Ceramic Resonator 8MHz ±0.5% (ToI) ±0.2% (Stability) 10pF 40Ohm 3-Pin SMD T/R	Murata	CSTNE8M00G520000R0
100	1	X6	SMD09506	MEMS Resonator 0.032768MHz	Murata	WMRAG32K76CS1C00R0

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Item	Q.ty	Ref.	Value	Description	Manufacturer	Order code
				±20ppm (Tol) -150/10ppm (Stability) 6.9pF/8pF 75000Ohm 4- Pin SMD T/R		

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Notice applicable to Evaluation Boards according to European Regulation

For the European Regulation of the Evaluation Board, the applicable EU directives are considered, with a particular attention to the Low Voltage Directive (LVD) 2014/35/EU, the Electromagnetic Compatibility (EMC) Directive 2014/30/EU, and the Radio Equipment Directive (RED) 2014/53/EU. If the Evaluation Board is outside the scope of the foregoing Directives, then the General Product Safety Directive (GPSD) 2001/95/EC and Council Directive 93/68/EEC, amending Directive 73/23/EEC on electrical equipment designed for use within certain voltage limits, are applicable.

The Evaluation Board meets the requirements of the Restriction of Hazardous Substances (RoHS 2 or RoHS recast) Directive 2011/65/EU, Annex II, as amended by Directive 2015/863/EU.

Notice applicable to Evaluation Boards not FCC-Approved

This kit is designed to allow:

- Product developers to evaluate electronic components, circuitry, or software associated with the kit to determine whether to incorporate such items in a finished product and
- 2. Software developers to write software applications for use with the end product.

This kit is not a finished product and when assembled may not be resold or otherwise marketed unless all required FCC equipment authorizations are first obtained. Operation is subject to the condition that this product not cause harmful interference to licensed radio stations and that this product accept harmful interference. Unless the assembled kit is designed to operate under part 15, part 18 or part 95 of 47 CFR, Chapter I ("FCC Rules"), the operator of the kit must operate under the authority of an FCC license holder or must secure an experimental authorization under part 5 of this chapter.

For Evaluation Boards annotated as FEDERAL COMMUNICATIONS COMMISSION (FCC) Part 15 Compliant

- FCC Interference Statement for Class A Evaluation Boards: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
- FCC Interference Statement for Class B Evaluation Boards: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
 - Reorient or relocate the receiving antenna.
 - Increase the separation between the equipment and receiver.
 - Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
 - Consult the dealer or an experienced radio/TV technician for help.
- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

 (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

WARRANTY

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INDEMNIFICATION

You shall, at Your expense, defend ST and its Affiliates against a claim or action brought by a third party for infringement or misappropriation of any patent, copyright, trade secret or other intellectual property right of a third party to the extent resulting from (1) Your combination of the Evaluation Board with any other component, system, software, or firmware, (2) Your modification of the Evaluation Board, or (3) Your use of the Evaluation Board in a manner not permitted under this Agreement.

You shall indemnify ST and its Affiliates against and pay any resulting costs and damages finally awarded against ST or its Affiliates or agreed to in any settlement, provided that You have sole control of the defense and settlement of the claim or action, and ST cooperates in the defense and furnishes all related evidence under its control at Your expense. ST will be entitled to participate in the defense of such claim or action and to employ counsel at its own expense.

"Affiliates" means any corporation or other entity directly or indirectly controlled by, controlling or under common control with the entity in question, for so long as such ownership exists. "Control" means the direct or indirect beneficial ownership of more than fifty (50%) percent of the stock or other equity interests entitled to vote for the election of directors or an equivalent governing body. Any such corporation or other legal entity shall be deemed to be an Affiliate of such Party only as long as such Control exists.

TERMINATION

ST may terminate this Agreement without notice if You breach this Agreement. Upon termination, You shall immediately destroy or return all copies of the software, firmware, and documentation of the Evaluation Board to ST and certify in writing to ST that You have done so.

APPLICABLE LAW AND JURISDICTION

This Agreement shall be governed, construed and enforced in accordance with the laws of Switzerland, without regard to its conflict of laws rules. The UN Convention on Contracts for the International Sale of Goods shall not apply to this Agreement. In case of dispute and in the absence of an amicable settlement, the only competent jurisdiction shall be the Courts of Geneva, Switzerland. Any breach of this Agreement by You may result in irreparable damage to ST for which ST will not have an adequate remedy at law. Accordingly, in addition to any other remedies and damages available, You acknowledge and agree that ST may immediately seek enforcement of this Agreement in any jurisdiction by means of specific performance or injunction, without any requirement to post a bond or other security.

SEVERABILITY

If any provision of this agreement is or becomes, at any time or for any reason, unenforceable or invalid, no other provision of this agreement shall be affected thereby, and the remaining provisions of this agreement shall continue with the same force and effect as if such unenforceable or invalid provisions had not been inserted in this Agreement. In addition, any unenforceable or invalid provision shall be deemed replaced by a provision that is valid and enforceable and that comes closest to expressing the intention of the unenforceable or invalid provision.

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WAIVER

The waiver by either party of any breach of any provision of this Agreement shall not operate or be construed as a waiver of any other or a subsequent breach of the same or a different provision.

RELATIONSHIP OF THE PARTIES

Nothing in this Agreement shall create, or be deemed to create, any joint venture, partnership, principal-agent, employer-employee or other relationship between the Parties, except that of independent contractors. Neither Party has the authority or power to bind, to contract in the name of, or to create a liability for the other in any way or for any purpose.

SURVIVAL

Any provision of this Agreement which imposes an obligation after termination of this Agreement shall survive the termination of this Agreement.

SECTION HEADINGS

Section headings are inserted for convenience only and shall not be used to interpret this Agreement.

WASTE AND RECYCLING

The Evaluation Board is not to be disposed of as urban waste. At the end of its life cycle, differentiated waste collection must be followed. Consult the local authorities for more information on the proper disposal channels. It is mandatory to separately collect the Evaluation Board and make sure it is delivered it to the appropriate waste management and recycling centers.

As of 15 August 2018, in all the countries belonging to the European Union, the Evaluation Board is subject to the WEEE Directive 2012/19/EU requirement; therefore, it is forbidden to dispose of the Evaluation Board as undifferentiated waste or with other domestic wastes. Consult the local authorities for more information on the proper recycling centers.

Disposing of the Evaluation Board incorrectly may cause damage to the environment and may be subject to fines based on specific countries' rules.

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IMPORTANT NOTICE - READ CAREFULLY

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