



7th Gen Intel® Core™ Processor
Modular-Designed Industrial Panel PC

KSM-KH Series

CM238



► Features

- Support Adaptive Display Platform
- Multiple Panel Sizes with Resistive/P-Capacitive Touch Screen
- Intel® Core™ Processor with Fanless Design
- Supports 9~36V Power Input
- IP65 Front Panel Protection
- Operating Temperature: -20 to 50°C



► System





Standard Ratio Specifications

MODEL NAME		KSM150-KH	KSM170-KH	KSM190-KH
DISPLAY & TOUCH SCREEN	Display Type	15" TFT LCD Panel	17" TFT LCD Pane	19" TFT LCD Panel
	Max. Resolution	1024 x 768	1280 x 1024	1280 x 1024
	Brightness (cd / m²)	300	350	350
	Touch Type	Projected Capacitive / 5-wire Resistive		
	Backlight Lifetime (hours)	70,000	30,000	70,000
FRONT I/O	USB (Optional)	1 x USB 2.0		
	OSD (Optional)	Backlight On-Off / Brightness Up / Brightness Down / Audio Up / Audio Down		
	LED Indicators (Optional)	Power LED / HDD LED / Alarm LED		
OTHERS	Auto Dimming (Optional)	Light Sensor		
ENVIRONMENT	Operating Temperature	-20 to 50°C	0 to 45°C	-20 to 50°C
	Storage Temperature	-30 to 70°C	-30 to 70°C	-30 to 70°C
	Relative Humidity	5 to 90% RH (non-condensing)		
SYSTEM	Processor	7th Generation Intel® Core™ Processors, BGA 1440 Intel® Xeon® Processor E3-1535M v6, Quad Core, 8M Cache, 3.1GHz (4.2GHz), 45W Intel® Core™ i7-7820EQ Processor, Quad Core, 8M Cache, 3.0GHz (3.7GHz), 45W Intel® Core™ i5-7440EQ Processor, Quad Core, 6M Cache, 2.9GHz (3.6GHz), 45W Intel® Core™ i5-7442EQ Processor, Quad Core, 6M Cache, 2.1GHz (2.9GHz), 25W Intel® Core™ i3-7100E Processor, Dual Core, 3M Cache, 2.9GHz, 35W Intel® Core™ i3-7102E Processor, Dual Core, 3M Cache, 2.1GHz, 25W		
	Chipset	Intel® CM238 Chipset	Intel® QM175 Chipset	
	Memory	Two 260-pin SODIMM up to 32GB (CM238 supports ECC)		Dual Channel DDR4 2400MHz
	BIOS	Insyde SPI 128Mbit		
	GRAPHICS	Controller	Intel® HD Graphics	
	Feature	OpenGL up to 5.0, DirectX 11, OpenCL 2.1 HW Decode: HEVC/H.265, H.264, M/JPEG, MPEG2, VC1/WMV9, VP8 (8-bit), VP9 (10-bit) HW Encode: HEVC/H.265, M/JPEG, MPEG2, VP8		
	Display	1 x VGA 1 x HDMI/DVI (DVI-D signal) (DVI available upon request) 1 x HDMI/DP++ (DP++ available upon request)	VGA: resolution up to 1920x1200 @ 60Hz DVI: resolution up to 2560x1600 @ 60Hz HDMI: resolution up to 4096x2160 @ 24Hz DP++: resolution up to 4096x2304 @ 60Hz	
	Triple Displays	VGA + HDMI/DVI (DVI-D signal) + HDMI/DP++		
STORAGE	Internal	1 x 2.5" SATA 3.0 Drive Bay		
EXPANSION	Interface	1 x Full-size Mini PCIe with micro SIM socket (PCIe/USB)		
		1 x Full-size Mini PCIe with micro SIM socket (USB) 1 x M.2 M Key 2280 (PCIe x4)		
ETHERNET	Controller	1 x Intel® I211AT PCIe (10/100/1000Mbps) 1 x Intel® I219LM with iAMT11.0 PCIe (10/100/1000Mbps) (only Core i7/i5 supports iAMT)		
LED	Indicators	1 x Power LED 1 x Status LED 1 x HDD LED		
FRONT I/O	Serial	2 x RS-232/422/485 (DB-9) (RS-232 with power) 2 x RS-232/422/485 (DB-9)		
	USB	2 x USB 2.0 (type A)		
	Buttons	1 x Power Button 1 x Reset Button		
	Wi-Fi Antenna	2 x Wi-Fi Module Antenna Hole		
REAR I/O	Ethernet	2 x GbE (RJ-45)		
	USB	4 x USB 3.0 (type A)		
	Display	1 x VGA 1 x HDMI/DVI (DVI-D signal) (DVI available upon request) 1 x HDMI/DP++ (DP++ available upon request)		
	Audio	1 x Line-out 1 x Mic-in (available upon request)		
WATCHDOG TIMER	Output & Interval	System Reset, Programmable via Software from 1 to 255 Seconds		
SECURITY	TPM	TPM 2.0		
POWER	Type	Wide Range 9~36V		
	Connector	3-pole Terminal Block	2-pin Power Extension Switch Connector	
OS SUPPORT		Windows 10 IoT Enterprise LTSB 64 Bit Linux (available upon request)		
MECHANISM	Construction	Metal + Aluminum		
	Mounting	Panel/VESA Mount 100 x 100 mm		
	Dimensions (W x H x D)	387 x 320 x 118 mm	404 x 363.8 x 102.8 mm	467 x 400 x 118mm
	Weight	7.7 kg	8.1 kg	10 kg
STANDARDS AND CERTIFICATIONS	Shock	Half sine wave 3G, 11ms, 3 shock per axis		
	Vibration	IEC68-2-64		
	Certification	CE, FCC, RoHS		



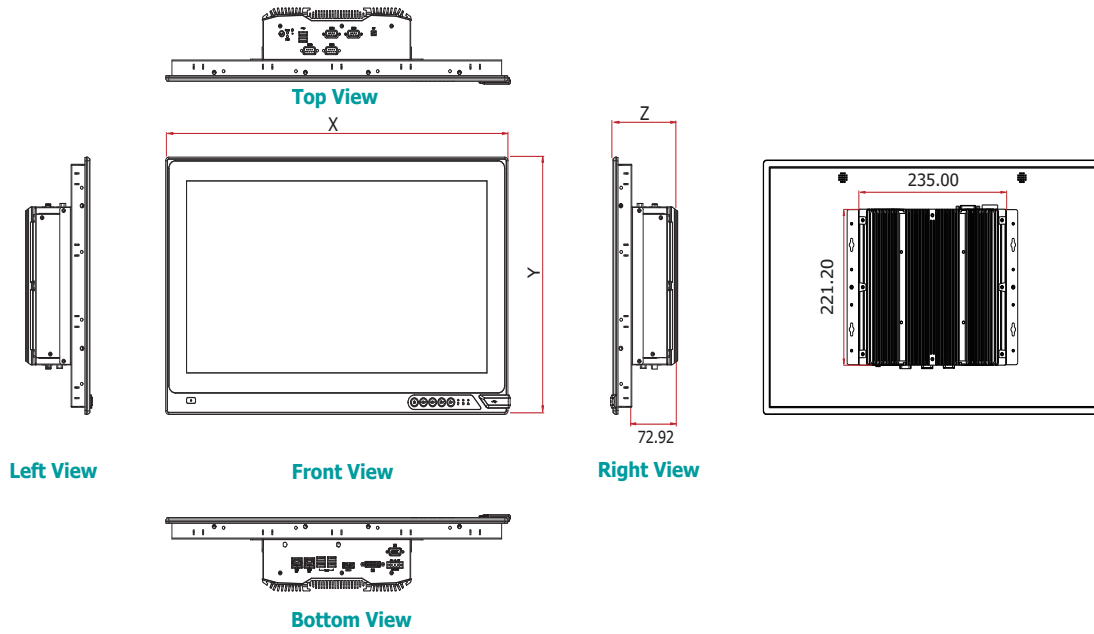
KSM-KH Series

Widescreen Ratio Specifications

MODEL NAME		KSM156-KH	KSM185-KH	KSM215-KH
DISPLAY & TOUCH SCREEN	Display Type	15.6" TFT LCD Panel	18.5" TFT LCD Pane	21.5" TFT LCD Panel
	Max. Resolution	1366 x 768	1366 x 768	1920 x 1080
	Brightness (cd/m²)	400	450	300
	Touch Type	Projected Capacitive / 5-wire Resistive		
	Backlight Lifetime (hours)	50,000	50,000	50,000
FRONT I/O	USB (Optional)	1 x USB 2.0		
	OSD (Optional)	Backlight On-Off / Brightness Up / Brightness Down / Audio Up / Audio Down		
	LED Indicators (Optional)	Power LED / HDD LED / Alarm LED		
OTHERS	Auto Dimming (Optional)	Light Sensor		
ENVIRONMENT	Operating Temperature	0 to 50°C	0 to 50°C	0 to 50°C
	Storage Temperature	-30 to 70°C	-30 to 70°C	-30 to 70°C
	Relative Humidity	5 to 90% RH (non-condensing)		
SYSTEM	Processor	7th Generation Intel® Core™ Processors, BGA 1440 Intel® Xeon® Processor E3-1535M v6, Quad Core, 8M Cache, 3.1GHz (4.2GHz), 45W Intel® Core™ i7-7820EQ Processor, Quad Core, 8M Cache, 3.0GHz (3.7GHz), 45W Intel® Core™ i5-7440EQ Processor, Quad Core, 6M Cache, 2.9GHz (3.6GHz), 45W Intel® Core™ i5-7442EQ Processor, Quad Core, 6M Cache, 2.1GHz (2.9GHz), 25W Intel® Core™ i3-7100E Processor, Dual Core, 3M Cache, 2.9GHz, 35W Intel® Core™ i3-7102E Processor, Dual Core, 3M Cache, 2.1GHz, 25W		
	Chipset	Intel® CM238 Chipset	Intel® QM175 Chipset	
	Memory	Two 260-pin SODIMM up to 32GB (CM238 supports ECC) Dual Channel DDR4 2400MHz		
	BIOS	Insyde SPI 128Mbit		
	GRAPHICS	Controller	Intel® HD Graphics	
	Feature	OpenGL up to 5.0, DirectX 11, OpenCL 2.1 HW Decode: HEVC/H.265, H.264, M/JPEG, MPEG2, VC1/WMV9, VP8 (8-bit), VP9 (10-bit) HW Encode: HEVC/H.265, M/JPEG, MPEG2, VP8		
	Display	1 x VGA 1 x HDMI/DVI (DVI-D signal) (DVI available upon request) 1 x HDMI/DP++ (DP++ available upon request)	VGA: resolution up to 1920x1200 @ 60Hz DVI: resolution up to 2560x1600 @ 60Hz HDMI: resolution up to 4096x2160 @ 24Hz DP++: resolution up to 4096x2304 @ 60Hz	
	Triple Displays	VGA + HDMI/DVI (DVI-D signal) + HDMI/DP++		
STORAGE EXPANSION	Internal	1 x 2.5" SATA 3.0 Drive Bay (RAID)		
	Interface	1 x Full-size Mini PCIe with micro SIM socket (PCIe/USB) 1 x Full-size Mini PCIe with micro SIM socket (USB) 1 x M.2 M Key 2280 (PCIe x4)		
ETHERNET	Controller	1 x Intel® I211AT PCIe (10/100/1000Mbps) 1 x Intel® I219LM with iAMT11.0 PCIe (10/100/1000Mbps) (only Core i7/i5 supports iAMT)		
LED	Indicators	1 x Power LED 1 x Status LED 1 x HDD LED		
FRONT I/O	Serial	2 x RS-232/422/485 (DB-9) (RS-232 with power) 2 x RS-232/422/485 (DB-9)		
	USB	2 x USB 2.0 (type A)		
	Buttons	1 x Power Button 1 x Reset Button		
	Wi-Fi Antenna	2 x Wi-Fi Module Antenna Hole		
REAR I/O	Ethernet	2 x GbE (RJ-45)		
	USB	4 x USB 3.0 (type A)		
	Display	1 x VGA 1 x HDMI/DVI (DVI-D signal) (DVI available upon request) 1 x HDMI/DP++ (DP++ available upon request)		
	Audio	1 x Line-out 1 x Mic-in (available upon request)		
WATCHDOG TIMER	Output & Interval	System Reset, Programmable via Software from 1 to 255 Seconds		
SECURITY	TPM	TPM 2.0		
POWER	Type	Wide Range 9~36V		
	Connector	3-pole Terminal Block	2-pin Power Extension Switch Connector	
OS SUPPORT		Windows 10 IoT Enterprise LTSB 64 Bit Linux (available upon request)		
MECHANISM	Construction	Metal + Aluminum		
	Mounting	Panel/VESA Mount 100 x 100 mm		
	Dimensions (W x H x D)	407.3 x 277.3 x 97.92 mm	472.06 x 314.15 x 102.8mm	544.2 x 360.6 x 118mm
	Weight	TBD	8.1 kg	9.4 kg
STANDARDS AND CERTIFICATIONS	Shock	Half sine wave 3G, 11ms, 3 shock per axis		
	Vibration	IEC68-2-64		
	Certification	CE, FCC, RoHS		



► **Dimensions**



Display Type	System Dimensions		
	X1	Y1	Z1
15" TFT LCD Panel	387	320	118
15.6" TFT LCD Panel	407.3	277.3	97.92
17" TFT LCD Panel	404	363.8	102.8
18.5" TFT LCD Panel	472.06	314.15	102.8
19" TFT LCD Panel	467	400	118
21.5" TFT LCD Panel	544.2	360.6	118



KSM-KH Series

Panel Mounting

Suggested cut out size

	System Dimensions (mm)	
Display Type	X1	Y1
PMKS150	367	300
PMKS156	389.3	259.3
PMKS170	386	346
PMKS185	454	296.1
PMKS190	447	380
PMKS215	526.2	342.6

Ordering Information

Model Name	Part Number	Description
KSM150P-KHW36	750-K15003-100G	15" TFT XGA Fanless Panel PC with Projected Capacitive Touch, Intel® 6th Core Processor, DC Input 9~36V Terminal, F/G SYSTEM RoHS
KSM150R-KHW36	750-K15003-200G	15" TFT XGA Fanless Panel PC with Resistive Touch, Intel® 6th Core Processor, DC Input 9~36V Terminal, F/G SYSTEM RoHS
KSM150P-KHW36-i5-KLU	750-K15003-300G	15" TFT XGA Fanless Panel PC with Projected Capacitive Touch, OSD, Light Sensor, USB, Intel® 6th Core Processor, DC Input 9~36V Terminal, F/G SYSTEM RoHS
KSM190P-KHW36-i5	750-K19002-100G	19" TFT XGA Fanless Panel PC with Projected Capacitive Touch, Intel® 7th Core Processor i5-7440EQ, DC Input 9~36V Terminal, F/G SYSTEM RoHS
KSM190R-KHW36-i5	750-K19002-200G	19" TFT XGA Fanless Panel PC with Resistive Touch, Intel® 7th Core Processor i5-7440EQ, DC Input 9~36V Terminal, F/G SYSTEM RoHS
KSM190P-KHW36-i5-KLU	750-K19002-300G	19" TFT XGA Fanless Panel PC with Projected Capacitive Touch, OSD, Light Sensor, USB, Intel® 7th Core Processor i5-7440EQ, DC Input 9~36V Terminal, F/G SYSTEM RoHS



► **Optional Items**

Optional Items	Part Number	Description
Memory	138-540002-100G	4GB DDR4 SODIMM RAM
	138-580002-100G	8GB DDR4 SODIMM RAM
	138-5G0161-100G	16GB DDR4 SODIMM RAM
HDD/SSD	635-550092-050G	2.5" SATA HDD, 500GB, RoHS
	635-500100-200G	2.5" SATA HDD, 1TB, RoHS
	635-610002-110G	2.5" SATA SSD, 1TB MLC, RoHS
	635-605122-110G	2.5" SATA SSD, 512GB MLC, RoHS
	635-602562-120G	2.5" SATA SSD, 256GB MLC, RoHS
	635-601282-190G	2.5" SATA SSD, 128GB MLC, RoHS
	635-600642-150G	2.5" SATA SSD, 064GB MLC, RoHS
Wi-Fi	761-110091-000G	Wi-Fi Kit, SparKLAN, WPEA-121N, w/IPX cable & antenna
	612-110050-300G	Wi-Fi module, SparKLAN, WPEA-252NI
Power Cord	785-PWRD	Power Cord, Standards (USA/EUR/CH), 1.8m, RoHS
Power Adapter	671-116001-000G	Power Adapter 160W , 19V/8.4A Level 5, RoHS
	671-116003-000G	Power Adapter 160W , 19V/8.4A Level 6, RoHS
Panel Mount Kits	761-P15002-000G	Panel Mount Kit for PMKS150 RoHS
	761-P19003-000G	Panel Mount Kit for PMKS190 RoHS
	761-P15002-000G	KSM150 Panel Mount Kit RoHS
	761-P19003-000G	KSM170-AL / KSM190-AL Panel Mount Kit RoHS
	TBD	KSM185 Panel Mount Kit RoHS
	761-KS2150-000G	KSM215-AL Panel Mount Kit RoHS
Wall Mount	761-TPC000-000G	ACCESSORY WALL MOUNT KITS

785-XXX is a group number instead of a unique part number. Please contact your regional sales representative if you need more information.

► **Matrix List**

		PMKS150	PMKS156	PMKS170	PMKS185	PMKS190	PMKS215
Box Module	BMAL	V	V	V	V	V	V
	BMSD	V	V	V	V	V	V
	BMKH	V	V	V	V	V	V

► **Packing List**

- 1 Single Box
- 1 3 pin Terminal Block Connector
- 2 Mini PCIe Screw
- 1 SATA Screw

Assured Systems

Assured Systems is a leading technology company with over 1,500 regular clients in 80 countries, deploying over 85,000 systems to a diverse customer base in 12 years of business. We offer high-quality and innovative rugged computing, display, networking and data collection solutions to the embedded, industrial, and digital-out-of-home market sectors.

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