



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
<b>DISPLAY &amp; TOUCH SCREEN</b>	<b>Display Type</b>	15" TFT LCD Panel	17" TFT LCD Pane	19" TFT LCD Panel
	<b>Max. Resolution</b>	1024 x 768	1280 x 1024	1280 x 1024
	<b>Brightness (cd / m<sup>2</sup>)</b>	300	350	350
	<b>Touch Type</b>	Projected Capacitive / 5-wire Resistive		
	<b>Backlight Lifetime (hours)</b>	70,000	30,000	70,000
<b>FRONT I/O</b>	<b>USB (Optional)</b>	1 x USB 2.0		
	<b>OSD (Optional)</b>	Backlight On-Off / Brightness Up / Brightness Down / Audio Up / Audio Down		
	<b>LED Indicators (Optional)</b>	Power LED / HDD LED / Alarm LED		
<b>OTHERS</b>	<b>Auto Dimming (Optional)</b>	Light Sensor		
<b>ENVIRONMENT</b>	<b>Operating Temperature</b>	-20 to 50°C	0 to 45°C	-20 to 50°C
	<b>Storage Temperature</b>	-30 to 70°C	-30 to 70°C	-30 to 70°C
	<b>Relative Humidity</b>	5 to 90% RH (non-condensing)		
<b>SYSTEM</b>	<b>Processor</b>	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		
	<b>Chipset</b>	Intel® CM238 Chipset	Intel® QM175 Chipset	
	<b>Memory</b>	Two 260-pin SODIMM up to 32GB (CM238 supports ECC)		Dual Channel DDR4 2400MHz
	<b>BIOS</b>	Insyde SPI 128Mbit		
	<b>GRAPHICS</b>	<b>Controller</b>	Intel® HD Graphics	
<b>Feature</b>		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		
<b>Display</b>		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	
<b>Triple Displays</b>		VGA + HDMI/DVI (DVI-D signal) + HDMI/DP++		
<b>STORAGE</b>	<b>Internal</b>	1 x 2.5" SATA 3.0 Drive Bay		
<b>EXPANSION</b>	<b>Interface</b>	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)		
<b>ETHERNET</b>	<b>Controller</b>	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)		
<b>LED</b>	<b>Indicators</b>	1 x Power LED 1 x Status LED 1 x HDD LED		
<b>FRONT I/O</b>	<b>Serial</b>	2 x RS-232/422/485 (DB-9) (RS-232 with power) 2 x RS-232/422/485 (DB-9)		
	<b>USB</b>	2 x USB 2.0 (type A)		
	<b>Buttons</b>	1 x Power Button 1 x Reset Button		
	<b>Wi-Fi Antenna</b>	2 x Wi-Fi Module Antenna Hole		
<b>REAR I/O</b>	<b>Ethernet</b>	2 x GbE (RJ-45)		
	<b>USB</b>	4 x USB 3.0 (type A)		
	<b>Display</b>	1 x VGA 1 x HDMI/DVI (DVI-D signal) (DVI available upon request) 1 x HDMI/DP++ (DP++ available upon request)		
	<b>Audio</b>	1 x Line-out 1 x Mic-in (available upon request)		
<b>WATCHDOG TIMER</b>	<b>Output &amp; Interval</b>	System Reset, Programmable via Software from 1 to 255 Seconds		
<b>SECURITY</b>	<b>TPM</b>	TPM 2.0		
<b>POWER</b>	<b>Type</b>	Wide Range 9~36V		
	<b>Connector</b>	3-pole Terminal Block	2-pin Power Extension Switch Connector	
<b>OS SUPPORT</b>		Windows 10 IoT Enterprise LTSB 64 Bit Linux (available upon request)		
<b>MECHANISM</b>	<b>Construction</b>	Metal + Aluminum		
	<b>Mounting</b>	Panel/VESA Mount 100 x 100 mm		
	<b>Dimensions (W x H x D)</b>	387 x 320 x 118 mm	404 x 363.8 x 102.8 mm	467 x 400 x 118mm
	<b>Weight</b>	7.7 kg	8.1 kg	10 kg
<b>STANDARDS AND CERTIFICATIONS</b>	<b>Shock</b>	Half sine wave 3G, 11ms, 3 shock per axis		
	<b>Vibration</b>	IEC68-2-64		
	<b>Certification</b>	CE, FCC, RoHS		



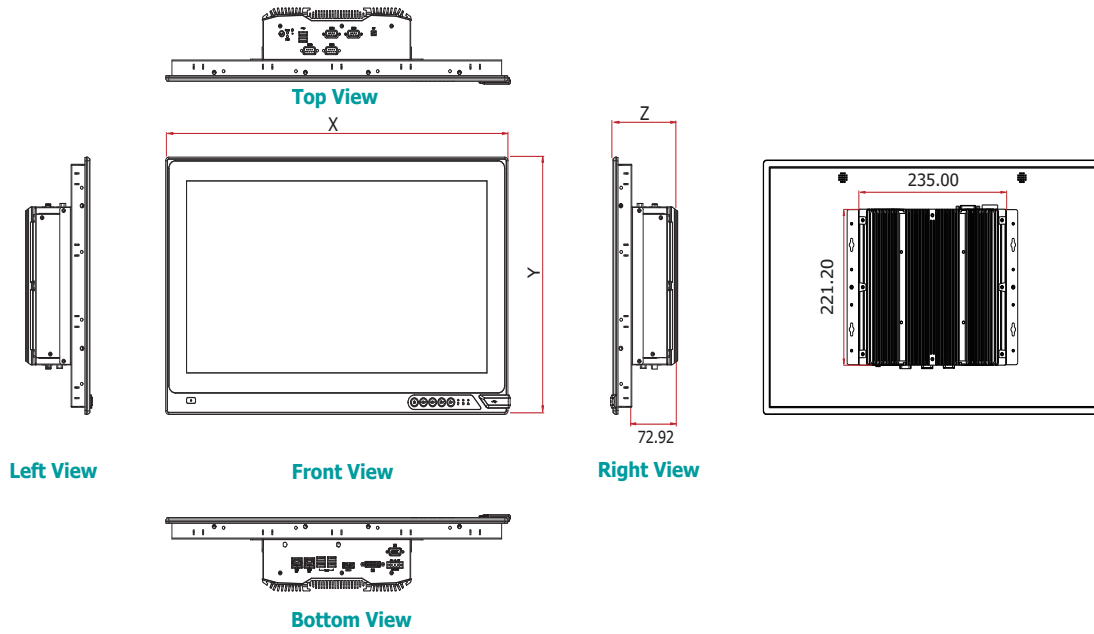
**KSM-KH Series**

**Widescreen Ratio Specifications**

MODEL NAME		KSM156-KH	KSM185-KH	KSM215-KH
<b>DISPLAY &amp; TOUCH SCREEN</b>	<b>Display Type</b>	15.6" TFT LCD Panel	18.5" TFT LCD Pane	21.5" TFT LCD Panel
	<b>Max. Resolution</b>	1366 x 768	1366 x 768	1920 x 1080
	<b>Brightness (cd/m<sup>2</sup>)</b>	400	450	300
	<b>Touch Type</b>	Projected Capacitive / 5-wire Resistive		
	<b>Backlight Lifetime (hours)</b>	50,000	50,000	50,000
<b>FRONT I/O</b>	<b>USB (Optional)</b>	1 x USB 2.0		
	<b>OSD (Optional)</b>	Backlight On-Off / Brightness Up / Brightness Down / Audio Up / Audio Down		
	<b>LED Indicators (Optional)</b>	Power LED / HDD LED / Alarm LED		
<b>OTHERS</b>	<b>Auto Dimming (Optional)</b>	Light Sensor		
<b>ENVIRONMENT</b>	<b>Operating Temperature</b>	0 to 50°C	0 to 50°C	0 to 50°C
	<b>Storage Temperature</b>	-30 to 70°C	-30 to 70°C	-30 to 70°C
	<b>Relative Humidity</b>	5 to 90% RH (non-condensing)		
<b>SYSTEM</b>	<b>Processor</b>	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		
	<b>Chipset</b>	Intel® CM238 Chipset	Intel® QM175 Chipset	
	<b>Memory</b>	Two 260-pin SODIMM up to 32GB (CM238 supports ECC) Dual Channel DDR4 2400MHz		
	<b>BIOS</b>	Insyde SPI 128Mbit		
	<b>GRAPHICS</b>	<b>Controller</b>	Intel® HD Graphics	
<b>GRAPHICS</b>	<b>Feature</b>	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		
	<b>Display</b>	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	
	<b>Triple Displays</b>	VGA + HDMI/DVI (DVI-D signal) + HDMI/DP++		
	<b>Internal</b>	1 x 2.5" SATA 3.0 Drive Bay (RAID)		
<b>STORAGE EXPANSION</b>	<b>Interface</b>	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)		
<b>ETHERNET</b>	<b>Controller</b>	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)		
<b>LED</b>	<b>Indicators</b>	1 x Power LED 1 x Status LED 1 x HDD LED		
<b>FRONT I/O</b>	<b>Serial</b>	2 x RS-232/422/485 (DB-9) (RS-232 with power) 2 x RS-232/422/485 (DB-9)		
	<b>USB</b>	2 x USB 2.0 (type A)		
	<b>Buttons</b>	1 x Power Button 1 x Reset Button		
	<b>Wi-Fi Antenna</b>	2 x Wi-Fi Module Antenna Hole		
<b>REAR I/O</b>	<b>Ethernet</b>	2 x GbE (RJ-45)		
	<b>USB</b>	4 x USB 3.0 (type A)		
	<b>Display</b>	1 x VGA 1 x HDMI/DVI (DVI-D signal) (DVI available upon request) 1 x HDMI/DP++ (DP++ available upon request)		
	<b>Audio</b>	1 x Line-out 1 x Mic-in (available upon request)		
<b>WATCHDOG TIMER</b>	<b>Output &amp; Interval</b>	System Reset, Programmable via Software from 1 to 255 Seconds		
<b>SECURITY</b>	<b>TPM</b>	TPM 2.0		
<b>POWER</b>	<b>Type</b>	Wide Range 9~36V		
	<b>Connector</b>	3-pole Terminal Block	2-pin Power Extension Switch Connector	
<b>OS SUPPORT</b>		Windows 10 IoT Enterprise LTSB 64 Bit Linux (available upon request)		
<b>MECHANISM</b>	<b>Construction</b>	Metal + Aluminum		
	<b>Mounting</b>	Panel/VESA Mount 100 x 100 mm		
	<b>Dimensions (W x H x D)</b>	407.3 x 277.3 x 97.92 mm	472.06 x 314.15 x 102.8mm	544.2 x 360.6 x 118mm
	<b>Weight</b>	TBD	8.1 kg	9.4 kg
<b>STANDARDS AND CERTIFICATIONS</b>	<b>Shock</b>	Half sine wave 3G, 11ms, 3 shock per axis		
	<b>Vibration</b>	IEC68-2-64		
	<b>Certification</b>	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

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

**Ordering Information**

Model Name	Part Number	Description
<b>KSM150P-KHW36</b>	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
<b>KSM150R-KHW36</b>	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
<b>KSM150P-KHW36-i5-KLU</b>	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
<b>KSM190P-KHW36-i5</b>	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
<b>KSM190R-KHW36-i5</b>	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
<b>KSM190P-KHW36-i5-KLU</b>	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
<b>Memory</b>	138-540002-100G	4GB DDR4 SODIMM RAM
	138-580002-100G	8GB DDR4 SODIMM RAM
	138-5G0161-100G	16GB DDR4 SODIMM RAM
<b>HDD/SSD</b>	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
<b>Wi-Fi</b>	761-110091-000G	Wi-Fi Kit, SparKLAN, WPEA-121N, w/IPX cable & antenna
	612-110050-300G	Wi-Fi module, SparKLAN, WPEA-252NI
<b>Power Cord</b>	785-PWRD	Power Cord, Standards (USA/EUR/CH), 1.8m, RoHS
<b>Power Adapter</b>	671-116001-000G	Power Adapter 160W , 19V/8.4A Level 5, RoHS
	671-116003-000G	Power Adapter 160W , 19V/8.4A Level 6, RoHS
<b>Panel Mount Kits</b>	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
<b>Wall Mount</b>	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
<b>Box Module</b>	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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