

# **SR100-X3**

MIL-STD Rugged Fanless Computer



User's Manual Revision Date: March. 30. 2020 Revision Date: March. 30. 2020

### **Safety Information**

#### **Electrical safety**

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area.
- If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your local distributor.

#### **Operation safety**

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter any technical problems with the product, contact your local distributor

#### Statement

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- All product specifications are subject to change without prior notice

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### **Revision History**

Revision	Date (yyyy/mm/dd)	Changes
V1.0	2020/05/30	First release

### Packing list

ltem	Description	Q'ty
1	SR100-X3 Embedded System	1
2	Driver CD	1
3	Terminal Block Power Connector (For DC Power Input)	1



If any of the above items is damaged or missing, please contact your local distributor.

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### **Chapter 1: Product Introduction**

### 1.1 Specifications

System	
CPU	Core i7-7820EQ, 8M Cache (45W)
Memory type	DDR4 Up to 32GB SO-DIMM
Chipset	QM175 PCH
DISPLAY	
Display Port	2, Max resolution up to 3840 x 2160
DVI-D	1, Max resolution up to 2048 x 1536
LVDS	Dual channel 24bit LVDS
STORAGE	
mSATA	512 GB
ETHERNET	
Chipset	1 x Intel I210-IT & 1 x I 219-LM GbE
WOL	Yes
REAR I/O	
DisplayPort	2
DVI-D	1
Ethernet	2 x RJ45
COM Port	1 x RS232/422/485 with 5V/12V selectable
USB Port	2 x USB 3.0
Audio	1 x MIC, 1 x Line out
Power Requirem	EN
Power Input	9V~36V DC-in
APPLICATIONS, OP	ERATING SYSTEM
Applications	Energy/Smart Grid/Power Plant Management, Intelligent Automation and
	manufacturing applications
Operating System	Windows 10 64Bit ,Windows server 2012 r2, Windows server 2016

Ubuntu13.04, Ubuntu13.10, Ubuntu14.04, Fedora20

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#### PHYSICAL

Dimension	250 x 149 x 76 mm
Weight	3.6 Kg (7.94 lbs)
Chassis	Aluminum Alloy, Corrosion Resistant
Finish	Anodic aluminum oxide (Color Iron gray)
Cooling	Natural Passive Convection/Conduction. No Moving Parts.

#### ENVIRONMENTAL

Compliance	MIL-STD-810G, CE and FCC, RoHS, WEEE	
Reliability	No Moving Parts; Passive Cooling	
	Designed & Manufactured using ISO 9001/2000 Certified Quality Program	
Operating Temp.	-40~70°C	
Storage Temp.	-40 to 85°C	

### 1.2 Front Panel I/O Placement



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#### 1.3 Rear Panel I/O Placement



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#### **1.4 Mechanical Dimensions**



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### **Chapter 2: Jumpers and Connectors Locations**

#### 2.1 Front Panel Connector Pin Definitions

#### CN9: USB3.0 \*2

	LOWER USB		UPPER USB	
PIN	DEFINITION	PIN	DEFINITION	
1	USB_VCC2	10	USB_VCC3	18 17 16 15 14
2	USBD0-	11	USBD1-	
3	USBD0+	12	USBD1+	
4	GND	13	GND	
5	USB_SSRX3N_C	14	USB_SSRX4N_C	
6	USB_SSRX3P_C	15	USB_SSRX4P_C	98765
7	GND	16	GND	
8	USB3TN3	17	USB3TN4	
9	USB3TP3	18	USB3TP4	

#### LED1: LAN1 LED STATUS

LED1	Light	Dark	Flash			
RED	1000M	100M	NA	$\bigcirc$	$\bigcirc$	$\bigcirc$
GREEN	LINK	UNLINK	ACTIVITY	$\bigcirc$		$\bigcirc$
GREEN	Linkik	ONLINK		LED3	LED1	LED2

#### LED2: LAN2 LED STATUS

LED2	Light	Dark	Flash			
RED	1000M	100M	NA	$\bigcirc$	$\bigcirc$	$\bigcirc$
GREEN	Link	Un-link	Activity	LED3	LED1	LED2

LED3: POWER/HDD LED



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LED2	Light	Dark	Flash	
RED	NA	HDD un-access	HDD access	
GREEN	Power On	Power Off	NA	LED3 LED1 LED2

#### SW1: POWER BUTTON

PIN	DEFINITION	
ON	NO LIGHT	Ċ
OFF	BLUE LIGHT	

#### 2.2 Rear Panel Connector Pin Definitions

#### **DC Adapter Power Input**

PIN	DEFINITION	1 4
1	+VIN	
2	+VIN	
3	GND	
4	GND	A A A A

### **CN6: Audio Jacks Connector (MIC)**

PIN	DEFINITION	
5	MIC_L	
4	GND	
3	NC	
2	MIC1_R	
1	GND	

#### **CN7: Audio Jacks Connector (Line-Out)**

PIN	DEFINITION	
5	FRONT_L	
4	GND	
3	NC	
2	FRONT_R	
1	GND	

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#### LAN1: Intel I219LM/LAN2: Intel I210IT



#### **DISPLAY PORT:**

PIN	DEFINITION	PIN	DEFINITION	
1	DPC_LANEP0	2	GND	
3	DPC_LANEN0	4	DPC_LANEP1	
5	GND	6	DPC_LANEN1	品羅品
7	DPC_LANEP2	8	GND	12:38:41
9	DPC_LANEN2	10	DPC_LANEP3	
11	GND	12	DPC_LANEN3	
13	DDIC_DDC_AUX_SEL	14	GND	
15	DPC_AUXP	16	GND	
17	DPC_AUXN	18	DPC_DET	
19	GND	20	DPC_PWR	

#### DVI: DVI-D

PIN	DEFINITION	PIN	DEFINITION	
1	TMDS Data2-	13	NC	
2	TMDS Data2+	14	+5V Power	
3	GND	15	GND	
4	NC	16	Hot Plug Detect	
5	NC	17	TMDS Data0-	
6	DDC Clock	18	TMDS Data0+	
7	DDC Data	19	GND	
8	Analog VSYNC	20	NC	
9	TMDS Data1-	21	NC	
10	TMDS Data1+	22	GND	
11	GND	23	TMDS Clock+	
12	NC	24	TMDS Clock-	
C1	NC	C2	NC	
C3	NC	C4	NC	
C5	DVI_GND	C6	DVI_GND	

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#### COM1: RS232/422/485 with 5V/12V selectable

PIN	DEFINITION	PIN	DEFINITION	
1	DCD1#_OPTO	6	DSR1#_OPTO	(
2	RXD1_OPTO	7	RTS1#_OPTO	P
3	TDX1_OPTO	8	CTS1#_OPTO	6
4	DRT1#_OPTO	9	COM1P9SEL	
5	GND	10	GND	



#### CN8: USB3.0 \*2

	LOWER USB		UPPER USB	
PIN	DEFINITION	PIN	DEFINITION	
1	USB_VCC0	10	USB_VCC1	18 17 16 15 14
2	USBD2-	11	USBD3-	
3	USBD2+	12	USBD3+	
4	GND	13	GND	
5	USB_SSRX1N_C	14	USB_SSRX2N_C	
6	USB_SSRX1P_C	15	USB_SSRX2P_C	98765
7	GND	16	GND	
8	USB3TN1	17	USB3TN2	
9	USB3TP1	18	USB3TP2	

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### **Chapter 3: AMI BIOS UTILITY**

This chapter provides users with detailed descriptions on how to set up a basic system configuration through the AMI BIOS setup utility.

#### 3.1 Starting

To enter the setup screens, perform the following steps:

- Turn on the computer and press the <Del> key immediately.
- After the <Del> key is pressed, the main BIOS setup menu displays. Other setup screens can be accessed from the main BIOS setup menu, such as the Chipset and Power menus.

#### 3.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. Some of the hot keys are <F1>, <F10>, <Enter>, <ESC>, and <Arrow> keys.

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12	
3	Δ

Some of the navigation keys may differ from one screen to another.

Left/Right	The Left and Right <arrow> keys moves the cursor to select a</arrow>
	menu.
Up/Down	The Up and Down <arrow> keys moves the cursor to select a</arrow>
	setup screen or sub-screen.
+- Plus/Minus	The Plus and Minus < Arrow> keys changes the field value of a
	particular setup setting.
Tab	The <tab> key selects the setup fields.</tab>
F1	The <f1> key displays the General Help screen.</f1>
F10	The <f10> key saves any changes made and exits the BIOS setup</f10>
	utility.
Esc	The <esc> key discards any changes made and exits the BIOS</esc>
	setup utility.
Enter	The <enter> key displays a sub-screen or changes a selected or</enter>
	highlighted option in each menu.

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#### 3.3 Main Menu

The Main menu is the screen that first displays when BIOS Setup is entered, unless an error has occurred.



#### System Date

Use this function to change the system date.

Select System Date using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields.

The date setting must be entered in MM/DD/YY format.

#### System Time

Use this function to change the system time.

Select System Time using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields.

The time setting is entered in HH:MM:SS format.

**Note:** The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

#### **Access Level**

Display the access level of the current user in the BIOS.

#### 3.4 Advanced Menu

The Advanced Menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference. <u>Setting incorrect field values</u> <u>may cause the system to malfunction.</u>

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Aptio Setup Utility – Copyright (C) 2020 American Main Advanced Chipset Security Boot Save & Exit	Megatrends, Inc.
<ul> <li>CPU Configuration</li> <li>Power &amp; Performance</li> <li>PCH-FW Configuration</li> <li>ACPI Settings</li> <li>IT8786 Super IO Configuration</li> <li>Hardware Monitor</li> <li>Network Stack Configuration</li> <li>CSM Configuration</li> <li>CSM Configuration</li> </ul>	CPU Configuration Parameters
Version 2.18.1263. Copyright (C) 2020 American Meg	atrends, Inc.

### 3.4.1 CPU Configuration

Aptio Setup Utility – Advanced	Copyright (C) 2020 America	n Megatrends, Inc.
Advanced CPU Configuration Type ID Speed L1 Data Cache L1 Instruction Cache L2 Cache L3 Cache L4 Cache VMX SMX/TXT Intel (VMX) Virtualization Technology Active Processor Cores Hyper-Threading	Intel(R) Core(TM) i7-7820EQ CPU @ 3.00GHz 0x906E9 3000 MHz 32 KB x 4 32 KB x 4 256 KB x 4 8 MB N/A Supported Supported IEnabled] [All] [Enabled]	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology. ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.18.1263. 0	Copyright (C) 2020 American Me	gatrends, Inc.

3.4.2 Power & Performance



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Aptio Setup Utility - Co Advanced	pyright (C) 2020 America	n Megatrends, Inc.
Power & Performance > CPU - Power Management Control > GT - Power Management Control		CPU — Power Management Control Options
		<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.18.1263. Cop	yright (C) 2020 American M	egatrends, Inc.

### 3.4.3 PCH-FW Configuration

Aptio Setup Utility Advanced	– Copyright (C) 2020 America	n Megatrends, Inc.
ME Firmware Version ME Firmware Mode ME Firmware SKU ME File System Integrity Value ME Firmware Status 1 ME Firmware Status 2 NFC Support ME State Manageability Features State ME Unconfig on RTC Clear	11.8.50.3425 Normal Mode Corporate SKU 2 0×90000255 0×66008306 Disabled [Enabled] [Enabled] [Enabled]	When Disabled ME will be put into ME Temporarily Disabled Mode.
▶ Firmware Update Configuration		<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>

3.4.4 ACPI Setting

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#### 3.4.5 IT8786 Super IO Configuration



User can choose a mode (RS232/RS422/RS485) on each serial port.

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	Aptio S Advanced	etup Utility – C	opyright	(C) 2020 Amer	rican Megatrends, Inc.
Seria Seria Devia	Advanced 1 Port 2 Configu al Port se Settings	uration	(Enabled) ID=2F8h;	IRQ=3;	Enable or Disable Serial Port (COM)
	Vers	sion 2.18.1263. Co	oyright (C	) 2020 America	can Megatrends, Inc.



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Aptio Setup Utili Advanced	ty – Copyright (C) 2020 Amer	rican Megatrends, Inc.
Serial Port 3 Configuration		Enable or Disable Serial Port (COM)
Serial Port Device Settings	[Enabled] IO=3E8h; IRQ=11;	
		<pre>++: Select Screen t1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values</pre>
		F3: Optimized Defaults F4: Save & Exit ESC: Exit



3.4.6 Hardware Monitor

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Pc Health Status         FAN Setting       Enable Smart Fan]         Set Tempactive S.F.       [67 C]         Set Tempactive full run       [82 C]         Initial FAN speed (S.F.)       [50 %]         CPU Temperature       : +56 %         System Temperature       : +39 %         Fan Speed       : 1785 RPM         Voore       : +0.895 %         VDDQ       : +11.033 V         +12V       : +11.191 V         +5V       : +4.600 V	Aptio Setup Utility - Advanced	· Copyright (C) 2020 America	n Megatrends, Inc.
i i e to toto gravitate (0) 2020 American Maratmanda Tra	Pc Health Status FAN Setting Set Tempactive S.F. Set Tempactive full run Initial FAN speed (S.F.) CPU Temperature System Temperature Fan Speed Vcore VDDQ +12V +5V	[Enable Smart Fan] [67 C] [82 C] [50 %] : +56 % : +39 % : 1785 RPM : +0.895 V : +1.803 V : +11.191 V : +4.600 V	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>

### 3.4.7 CSM Configuration

Aptio Setup Utility - Advanced	Copyright (C) 2020 America	n Megatrends, Inc.
Compatibility Support Module Configu	ration	Enable/Disable CSM Support.
CSM16 Module Version	07.81	
GateA20 Active Option ROM Messages INT19 Trap Response	[Upon Request] [Force BIOS] [Immediate]	
Boot option filter	[UEFI and Legacy]	
Option ROM execution		++: Select Screen
Network Storage Video Other PCI devices	[Do not launch] [Legacy] [Legacy] [UEFI]	<pre> f4: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
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3.5 Chipset

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#### 3.5.1 SA Configuration

f	Aptio Setup Utility – C Chipset	opyright (C) 2	020 American	Megatrends,	Inc.
System Agent (	SA) Configuration			Graphics Con	figuration
SA PCIE Code V VT-d	/ersion	2.9.0.0 Supported			
▶ Graphics Confi	iguration		1 1 E + F F F F F F E	<ul> <li>Select Scr</li> <li>Select Ite</li> <li>Select Ite</li> <li>Change Op</li> <li>General He</li> <li>Previous Va</li> <li>Optimized C</li> <li>Save &amp; Exit</li> <li>SC: Exit</li> </ul>	een m t. lp hlues hefaults
	Version 2.18.1263. Co	pgright (C) 2020	Third real hose		

3.5.1.1 Graphics Configuration

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#### 3.5.1.2 LCD Control

Aptio Setup Utilit Chipset	ty – Copyright (C) 2020 Ame	rican Megatrends, Inc.
LCD Control Primary IGFX Boot Display LCD Panel Type Panel Scaling Backlight Control Active LFP Panel Color Depth Backlight Brightness	[VBIDS Default] [VBIDS Default] [Auto] [PWM Normal] [No eDP] [18 Bit] 255	Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.18.12	263. Copyright (C) 2020 Americ	an Megatrends, Inc.

**Primary IGFX Boot Display:** Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display.

**LCD Panel Type:** Select LCD panel used by Internal Graphics Device by selecting the appropriate setup item.

**SDVO-LFP Panel Type:** Select SDVO panel used by Internal Graphics Device by selecting the appropriate setup item.

**Panel Scaling:** Select the LCD panel scaling option used by the Internal Graphics Device.

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#### Backlight control: backlight control setting

Panel Color Depth: select the LFP panel color depth.

#### 3.5.2 PCH-IO Configuration

Ar	o <mark>tio Setup Utility -</mark> Chipset	Copyright (C) 20	20 American Megatrends,	Inc.
PCH-IO Configur	ation		SATA Device	Options Settings
<ul> <li>SATA And RST Co</li> <li>Security Config</li> </ul>	onfiguration guration			
				reen
			t∔: Select Ite Enter: Select +/−: Change Op	m t.
			F1: General He F2: Previous Va F3: Optimized D	lp alues Defaults
			ESC: Exit	
Le				
	Version 2 18, 1263, 0	opyright (C) 2020 f	American Megatrends, Inc.	

#### 3.6 Security



3.7 Boot



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Aptio Setup Main Advanced Chipset	Utility – Copyright (C) 2020 American Security <mark>Boot</mark> Save & Exit	n Megatrends, Inc.
Boot Configuration Bootup NumLock State Quiet Boot	[On] [Enabled]	Select the keyboard NumLock state
Boot Option Priorities Fast Boot	[Disable]	
New Boot Option Policy	[Default]	
		<pre> ++: Select Screen  14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version	2.18.1263. Copyright (C) 2020 American Mo	egatrends, Inc.

Bootup NumLock State: Select the keyboard NumLock state.

Quiet Boot: Enables or disables Quiet Boot option.

**Fast Boot:** Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

#### **Boot option priorities**

Boot Option #1: Sets the system boot order.

#### 3.8 Save & Exit

Aptio Setup Utility – Copyright (C) 2020 America Main Advanced Chipset Security Boot Save & Exit	n Megatrends, Inc.
Save Options Save Changes and Exit Discard Changes and Reset Discard Changes and Reset Discard Changes Discard Changes Default Options Restore Defaults Save as User Defaults Restore User Defaults Boot Override Launch EFI Shell from filesystem device	<pre>Exit system setup after saving the changes.  ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
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This screen provides functions for handling changes made to the BIOS settings and the exiting of the Setup program.

Save Changes and Exit Exit system setup after saving the changes. Discard Changes and Exit Exit system setup without saving any changes. Save Changes and Reset Reset the system after saving the changes. Discard Changes and Reset Reset system setup without saving any changes. Save Options Save Changes: Save Changes done so far to any of the setup options. Discard Changes: Discard Changes done so far to any of the setup options.