



FEATURE HIGHLIGHTS

- IEC 61850-3 certified for easy setup in IEC 61850-3 substations
- Ideal for IoT and IIoT applications.
- Wide -40°C to +80°C temperature range; Industrial EMC protection
- 6 x 10/100Mbps RJ45 ports or 6 x 100Mbps SFP Slots
- Up to 16 x RS-232/422/485 ports – selectable baud rate up to 921.6 Kbps
- 3 kV optional isolation on the serial ports
- Internal SD Card slot
- ATOP customized Linux SDK environment with reliable APIs
- Redundant Power Input for fault protection: either 24-48 VDC or High-Voltage AC/DC (100-240VAC or 100-370VDC)
- Rugged metal housing in 1U Rack-mount (rack-mount kit included)

PRODUCT DESCRIPTION

Providing connectivity for the Internet of Things

ATOP's Industrial Embedded Computer is your ideal flexible Gateway to the Internet of Things, specifically tailored for advanced Power Substation applications. It provides Serial, Ethernet connectivity and interfaces that can unlock your potential. Based on your specific application, it allowing almost any serial device to be connected, providing and retrieving the data you need to and from the cloud, no matter what provider you're using.

Programmability

Write your customized application in C language and Run it on its powerful Industrial low-power 1GHz ARM Cortex A8 TI Sitara AM3352 CPU. Make flexible use of your peripherals, no matter storage, Serial, or USB are needed.

SE5908A/16A is available as a SDK/BSP. The SDK development environment reserves the maximum flexibility. Bottom to top editable software architecture allowed easily to customize or add the IoT applications for different using scenarios. Included Linux kernel source extend the capability of the kernel layer. Changeable WEB pages allowed to easily customize proprietary style. With the SE5908A/16A SDK, it will extend your possibility while building your IoT applications.

Rugged and flexible for advanced developments

SE5908A/SE5916A embed *high EMC protection, wide temperature operation*, programming and installation flexibility in one device. The *IEC61850-3 certified hardware* makes it the most advanced Computing option, while the dual power supply provides additional redundancy in case of power failure. High-Voltage option makes the device suitable for High-Voltage AC or DC inputs (100-240 VAC or 100-370VDC) that are common in substation environments., without additional cabling and power supply.

APPLICATION

The **IoT** (Internet of Things) or **IIoT** (Industrial Internet of Things) is a trending topic these days. It's all about bringing devices, sensors, actuators, data and commands to the cloud, with the ultimate goal to improve the quality of life, the services Smart Cities can offer, saving energy or saving money. This requires two things: to vehiculate the collected data to the cloud in a format that can be recognized and processed and to process, compute and analyze all this amount of data in real time.

It is not a concept far from reality. Imagine you'd like to bridge a Modbus Sensor to the cloud. And you'd like to have the application running on the cloud to be able to process multiple sensors' data, and to trigger some event in some specific stations along the network. You may also have the need to override the cloud control and manage the application locally. Any application has its story.

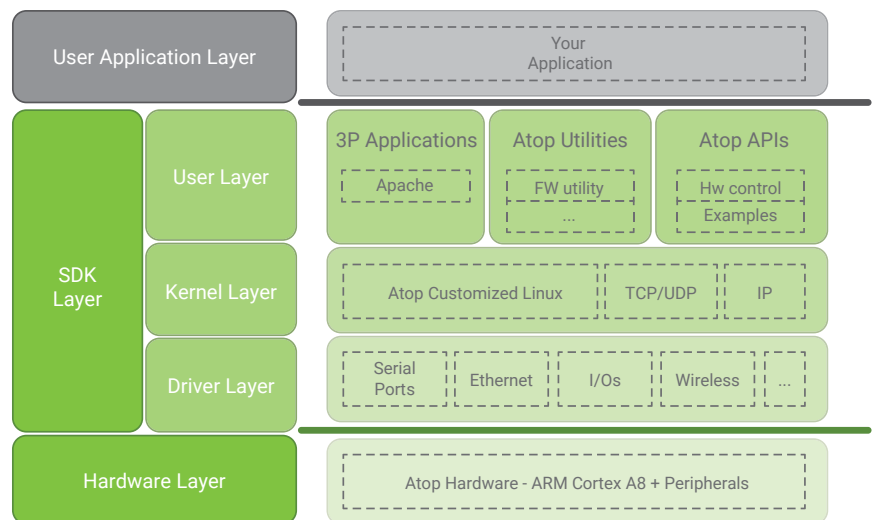
Here at ATOP, we understand these different needs and we are providing you different working models, based on what your needs are.

Use the Standard SDK, programmable embedded computer if:

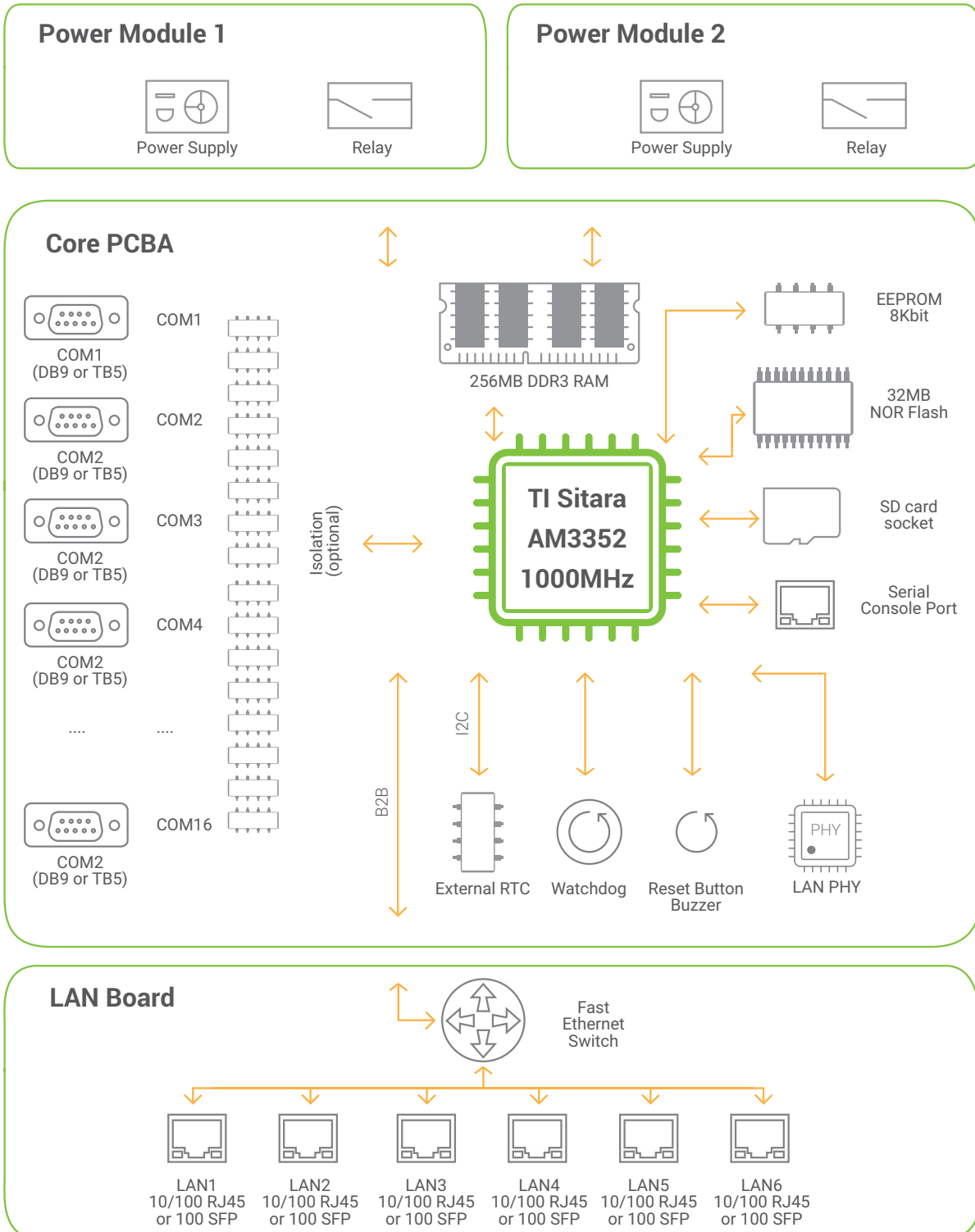
- You are familiar with Linux OS
- You have ANSI C programming skills
- Your application is strictly time/performance sensitive
- Your application has very critical exception handling requirements

Our SDK products provide:

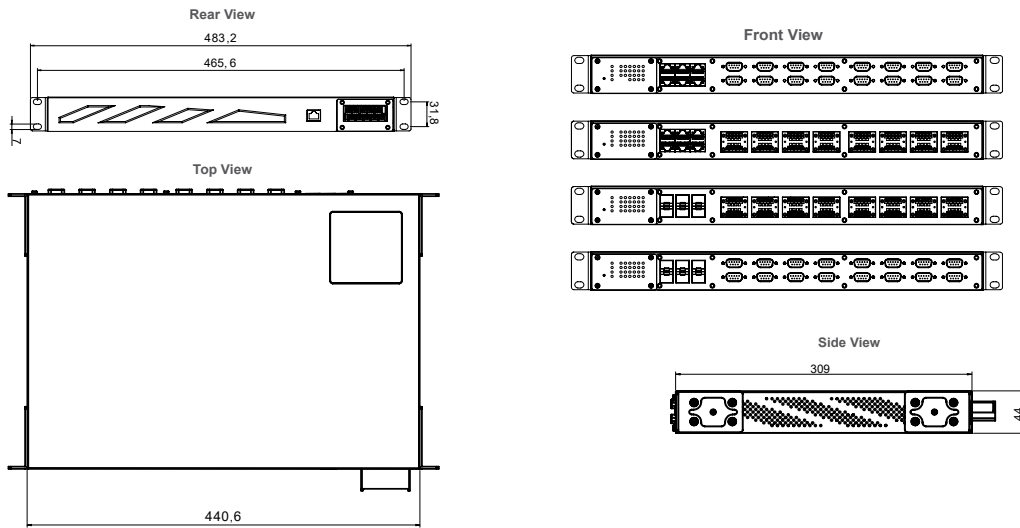
- Ported, proven and tested peripherals (such as I/Os, Ethernet, Serial, Relays) and integrated drivers
- ATOP customized Linux Kernel and network protocols
- Ported, debugged and proven third party application
- Utilities and APIs to control the hardware in an easy and effective way
- Opened software architecture to create your own system image
- Linux source code to extend the kernel capability
- Modifiable WEB contents to customize proprietary WEB style
- Example of source code



BLOCK DIAGRAM



DIMENSIONS & LAYOUT



SPECIFICATIONS

Hardware Specifications									
CPU	Texas Instruments Sitara ARM Cortex A8 AM3352 1000MHz								
Flash	32 MB NOR Flash (customizable upon request up to 64 MB)								
RAM	256 MB DDR3 (customizable upon request up to 1 GB)								
EEPROM	24LC64								
Watchdog	ADM706								
Real Time Clock (RTC)	Yes - with external chip								
Buzzer	Yes								
Console port	Yes - RJ45 Serial Console								
Reset button	Yes								
Network Interface									
Standards	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) and 100BaseF(X)								
Ethernet Ports	6x 10/100 BASE-T(X) RJ45 or 6x 100 BASE-F(X) SFP Slots (SFP version)								
Ethernet Switch	Embedded 8-Ports Fast-Ethernet Switch (configurable). Each port can work as single Subnet or as Switch.								
Serial Interface									
Connector	DB version: D-Sub9 (DB9) connector TB and SiS version: 5-Pin Terminal Block (5.08mm)								
Ports	SE5908A: 8-ports (RS-232 (supports only 5-pin mode)/RS-422/RS-485) SE5916A: 16-ports (RS-232 (supports only 5-pin mode)/RS-422/RS-485)								
Serial Console	1x Serial Console port (RJ45)								
Serial Port Isolation	3 kV (SiS version only)								
Pull-high / Pull-low /Term. resistors	Software selectable.								
Configuration	<table border="0"> <tr> <td>Baud Rate</td> <td>50-921,600bps</td> </tr> <tr> <td>Data Bits</td> <td>5, 6, 7, 8</td> </tr> <tr> <td>Stop Bits</td> <td>1, 2</td> </tr> <tr> <td>Flow Control</td> <td>None, Xon/Xoff, RTS/CTS (RS-232 only)</td> </tr> </table>	Baud Rate	50-921,600bps	Data Bits	5, 6, 7, 8	Stop Bits	1, 2	Flow Control	None, Xon/Xoff, RTS/CTS (RS-232 only)
Baud Rate	50-921,600bps								
Data Bits	5, 6, 7, 8								
Stop Bits	1, 2								
Flow Control	None, Xon/Xoff, RTS/CTS (RS-232 only)								
Relay Output									
Relay Output	1 x 1A@30VDC (Normal open)								
Other interfaces									
USB ports	No								
SD card	SD card slot (internal)								

Software	
Bootloader	U-boot 2014.07
Linux kernel	Linux 3.14.26 (SDK version)
Linux toolchain	linux 32 bits toolchain gcc (C/C++ PC cross compiler), glibc
Linux toolchain	RS232, RS422, RS485, RTC, watchdog, LED, Relay output, Buzzer, network socket
Power	
Rated Supply Voltage	Redundant 24-48 VDC or Redundant 100-240 VAC/ 100-370 VDC (HV Series)
Input Voltage Range	Redundant 19.2-52.8 VDC or Redundant 85-264 VAC/ 100-370 VDC (HV Series)
Input Current	0.73 A @ 24 VDC 0.35 A @ 100 VAC 0.20 A @ 100 VDC
Power Consumption	Approximately 20 W
Connector	10-Pin Terminal Block
Power Redundancy	Yes
Reverse Polarity Protection	Yes
Environmental limits	
Operating Temperature	-40°C to +80°C (-40°F to +176°F)
Storage Temperature	-40°C to +85°C (-40°F to +185°F)
Ambient Relative Humidity	5% to 95%, 55°C (Non-condensing)
Mechanicals	
Housing	IP30 protection, SPCC metal housing
Dimensions(W x H x D)	440.6 x 44 x 309 mm (1U Rack-mount)
Installation	19" Rack-Mount (Kit included)
Weight	4,000g
Reset Button	Yes

REGULATORY APPROVALS

Regulatory Approvals				
Safety	EN61010-1, EN 61010-2-201			
EMC	FCC Part 15, Subpart B, Class A, EN 55032, Class A, EN 61000-6-2, EN 61000-3-2, EN 61000-3-3, EN 55024, EN 61000-6-4, IEC 61850-3 / IEEE 1613			
Test	Item		Value	Level
IEC 61000-4-2	ESD	Contact Discharge	±8kV	4
		Air Discharge	±15kV	4
IEC 61000-4-3	RS	Radiated (enclosure)	20 V/m	3
IEC 61000-4-4	EFT	AC Power Port	±4.0KV	4
		DC Power Port	±4.0KV	4
		Signal Port	±4.0KV	4
IEC 61000-4-5	Surge	AC Power Port	Line-to Line±2.0KV	4
		AC Power Port	Line-to Earth±4.0KV	4
		DC Power Port	Line-to Line±1.0KV	3
		DC Power Port	Line-to Earth±2.0KV	3
		Signal Port	Line-to Earth±4.0KV	4
IEC 61000-4-6	CS	AC Power Port	10 V rms	3
		DC Power Port		
		Signal Port		
IEC 61000-4-8	PFMF	Enclosure	100 A/m	5
			1000 A/m (1sec.)	6
IEC 61000-4-11	DIP	AC Power Port	30% reduction (Voltage Dips), 1 period	-
			60% reduction (Voltage Dips), 50 period	
			100%, reduction (Voltage interruptions), 5 period	
			100% reduction (Voltage interruptions), 50 period	
Shock Drop (Freefall) Vibration	MIL-STD-810F Method 516.5 MIL-STD-810F Method 516.5 MIL-STD-810F Method 514.5 C1 & C2			
RoHS II	Yes			
MTBF	SE5908A-6SFP-Sis-HV: 13.01 years; SE5916A-6SFP-Sis: 12.13 years			
Warranty	5 years			

ORDERING INFORMATION

Ordering information		
Model name	Part Number	Description
SE5908A	Contact Headquarter	Ind. 8 Port Emb. Computer,10/100BASE-T(X) RJ45, DB9
SE5908A-6SFP	Contact Headquarter	Ind. 8 Port Emb. Computer, 100BASE-FX SFP slot, DB9
SE5908A-6SFP-HV	Contact Headquarter	Ind. 8 Port Emb. Computer, 100BASE-FX SFP slot, DB9
SE5908A-6SFP-Sis	Contact Headquarter	Ind. 8 Port Emb. Computer, 100BASE-FX SFP,Isolated
SE5908A-6SFP-Sis-HV	Contact Headquarter	Ind. 8 Port Emb. Computer, 100BASE-FX SFP, Isolated
SE5908A-6SFP-TB	Contact Headquarter	Ind. 8 Port Emb. Computer, 100BASE-FX SFP slot, TB5
SE5908A-6SFP-TB-HV	Contact Headquarter	Ind. 8 Port Emb. Computer, 100BASE-FX SFP slot, TB5
SE5908A-HV	Contact Headquarter	Ind. 8 Port Emb. Computer,10/100BASE-T(X) RJ45, DB9
SE5908A-Sis	Contact Headquarter	Ind. 8 Port Emb. Comp.,10/100BASE(T(X) RJ45, Isolated
SE5908A-Sis-HV	Contact Headquarter	Ind. 8 Port Emb. Comp.,10/100BASE(T(X) RJ45, Isolated
SE5908A-TB	Contact Headquarter	Ind. 8 Port Emb. Computer,10/100BASE-T(X) RJ45, TB5
SE5908A-TB-HV	Contact Headquarter	Ind. 8 Port Emb. Computer,10/100BASE-T(X) RJ45, TB5
SE5916A	Contact Headquarter	Ind. 16 Port Emb. Computer,10/100BASE(T(X)RJ45, DB9
SE5916A-6SFP	Contact Headquarter	Ind. 16 Port Emb. Computer, 100BASE-FX SFP slot, DB9
SE5916A-6SFP-HV	Contact Headquarter	Ind. 16 Port Emb. Computer, 100BASE-FX SFP slot, DB9
SE5916A-6SFP-Sis	Contact Headquarter	Ind. 16 Port Emb. Computer,100BASE-FX SFP,Isolated
SE5916A-6SFP-Sis-HV	Contact Headquarter	Ind. 16 Port Emb. Computer, 100BASE-FX SFP,Isolated
SE5916A-6SFP-TB	Contact Headquarter	Ind. 16 Port Emb. Computer, 100BASE-FX SFP slot, TB5
SE5916A-6SFP-TB-HV	Contact Headquarter	Ind. 16 Port Emb. Computer, 100BASE-FX SFP slot, TB5
SE5916A-HV	Contact Headquarter	Ind. 16 Port Emb. Computer,10/100BASE(T(X)RJ45, DB9
SE5916A-Sis	Contact Headquarter	Ind. 16 Port Emb. Comp.,10/100BASE(T(X)RJ45,Isolated
SE5916A-Sis-HV	Contact Headquarter	Ind. 16 Port Emb. Comp.,10/100BASE(T(X)RJ45,Isolated
SE5916A-TB	Contact Headquarter	Ind. 16 Port Emb. Computer,10/100BASE(T(X)RJ45, TB5
SE5916A-TB-HV	Contact Headquarter	Ind. 16 Port Emb. Computer,10/100BASE(T(X)RJ45, TB5

Optional Accessories		
Model Name	Part Number	Description
SDR-75-24	50500752240001G	75W/3.2A DIN-Rail 24VDC power supply with universal 88-264VAC / 124-370VDC input
GDC-120	59906861G	120mm copper woven grounding cable
ADP-DB9(F)TB5	59906231G	Female DB9 to Female 3.81mm TB5 Converter
AXFD-1314-0523	522AXFD1314001G	SFP Transceiver; 155Mbps, Multi-mode; 1310nm; 2km; -40°C to +85°C, DDMI
AXFD-1314-0553	522AXFD1314011G	SFP Transceiver; 155Mbps, Single-mode; 1310nm; 30km; 40°C to +85°C, DDMI