SE5901B (SDK) Series

3G/4G LTE Cellular to Ethernet and Serial Secure Embedded Computer

FEATURED HIGHLIGHTS

- Ideal for IoT and IIoT applications.
- Extensive 3G and LTE Band Support:
  - EU: 2100/1800/850/2600/900/800MHz (B1/B3/B5/B7/B8/B20)
  - US: 1900/AWS/850/700/700/1900MHz (B2/B4/B5/B13/B17/B25)
- Wide temperature range for Industrial-grade performance
- 1 x 10/100/1000Mbps Ethernet port
- 1 x RS-232/485 port – baud rate up to 921.6 Kbps
- 1 x USB2.0 high speed OTG port; 1 x Port USB Power-only port
- 2 x Digital Inputs; 2 x Relays in the I/O version
- Additional embedded power-bank for fault-relay capability in B Version

PRODUCT DESCRIPTION

Providing connectivity for the Internet of Things

ATOP's Industrial Embedded Computer is your ideal flexible Gateway to the Internet of Things. It provides 3G/4G LTE, Serial, Ethernet and Cellular connectivity and additional I/Os and interfaces that can unlock your potential. Based on your specific application, it allows 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 800MHz ARM Cortex A8 TI Sitara AM3354 CPU. Make flexible use of your peripherals, no matter storage, SMS, Serial, I/Os and USB are needed.

SE5901B 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 SE5901B, it will extend your possibility while building your IoT applications.

Rugged and flexible for advanced developments

SE5901B embeds ***high EMC protection, wide temperature operation***, programming and installation flexibility in one device. A dedicated ***I/O version*** provides 2 Digital Inputs and 2 Digital Outputs, ***GPS version*** provides Global positioning system geolocation and, specifically for the Internet of Things, a ***"B" version*** provides additional 15 seconds power during a power failure, allowing the device to relay back to the host the failure. This is Industry 4.0.

TEL : + 886 - 3 - 5508137
FAX: + 886 - 3 - 5508131
EMAIL: sales@atop.com.tw
WEB: http://www.atop.com.tw

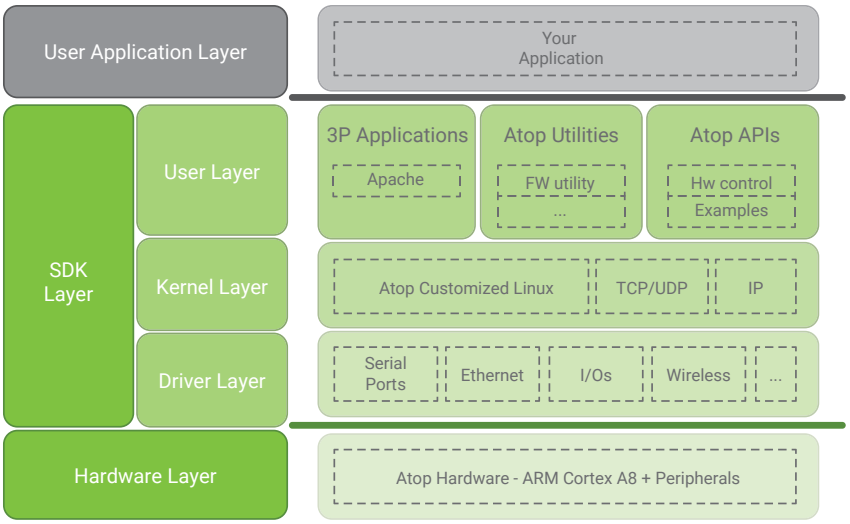
APPLICATION

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 applications*
- *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*

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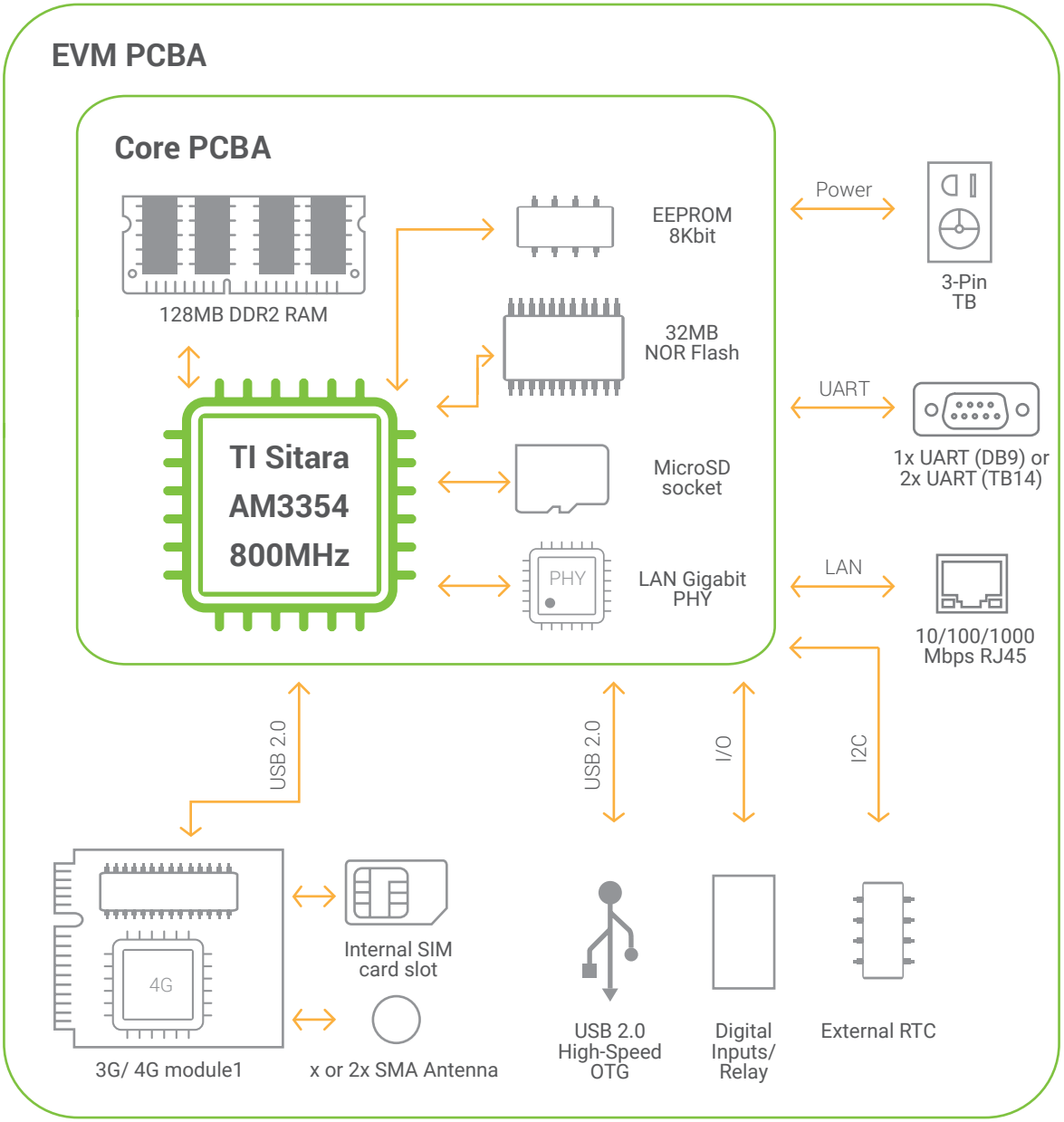
BLOCK DIAGRAM



SPECIFICATIONS

Hardware Specifications				
CPU	Texas Instruments Sitara ARM Cortex A8 AM3354 800MHz			
Flash	SDK version: 64 MB NOR Flash (customizable request to 32MB and 128 MB)			
RAM	SDK version: 256 MB DDR2 (customizable request to 128 MB)			
EEPROM	24LC64			
Watchdog	ADM706			
Real Time Clock (RTC)	Yes - with external chip			
Buzzer	Yes			
Console port	Yes - on-board connector			
Reset button	Yes			
Wireless Interface				
Standard	GSM/ GPRS/ EDGE/ UMTS/ HSPA+/ SCDMA/ LTE			
Wireless Module	EU version: Quectel EC25-E; US version: Quectel EC20-A			
Antennas/ SIM card	1 (3G) or 2 (4G) - Included. Internal SIM card slot (x1)			
Band Options	Version	Band	Bands	
	EU	FDD LTE TDD LTE WCDMA GSM	2100/1800/850/2600/900/800MHz (B1/B3/B5/B7/B8/B20) 2600/2300/2500MHz (B38/B40/B41) 2100/850/900MHz (B1/B5/B8) 900/1800	
	US	FDD LTE UMTS GSM	1900/1700/850/700/700bMHz (B2/B4/B5/B12/B17) 1900/1700/850MHz (B2/B4/B5) 850/1900MHz	
Data Rate	Version	Band	Downlink Speed	Uplink Speed
	EU	LTE-FDD LTE-TDD DC-HSPA+ UMTS TD-SCDMA EDGE GPRS	150 Mbps 130 Mbps 42 Mbps 384 Kbps 4.2 Mbps 236.8 Kbps 85.6 Kbps	50 Mbps 35 Mbps 5.76 Mbps 384 Kbps 2.2 Mbps 236.8 Kbps 85.6 Kbps
	US	LTE-FDD LTE-TDD DC-HSPA+ UMTS TD-SCDMA EDGE GPRS	100 Mbps 61 Mbps 42 Mbps 384 Kbps 4.2 Mbps 236.8 Kbps 85.6 Kbps	50 Mbps 18 Mbps 5.76 Mbps 384 Kbps 2.2 Mbps 236.8 Kbps 85.6 Kbps
Network Interface				
Standards	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) IEEE 802.3ab for 1000BaseT(X)			

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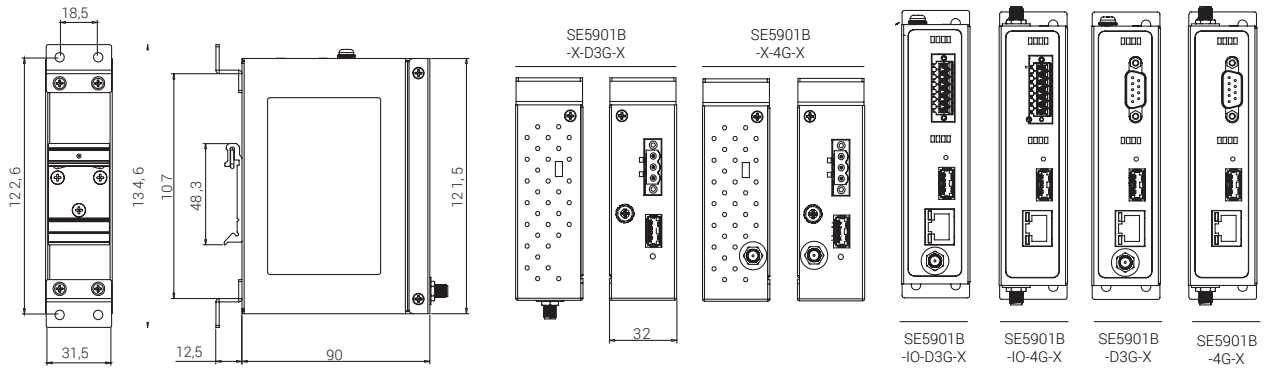
Ethernet Ports	1x 10/100/1000BASE-TX RJ-45	
Serial Interface		
Connector	D-Sub9 RS-232/485 software selectable (DB model) 14-Pin 5.08mm Terminal Block (integrated with DI/DOs)	
Ports	1 port RS-232/485 (2-wire) - (DB Model) 1 port RS-232/485 (2-wire) and 1 port RS-232 (IO model only)	
Configuration	Baud Rate Data Bits Stop Bits Flow Control	50 ~ 921,600bps 7, 8 1, 2 None, Xon/Xoff, RTS/CTS (RS-232 only)
Digital Inputs/Outputs (IO Models)		
Digital Inputs (DIs) Digital Outputs (DOs)	2 channels photo coupler isolated digital input 2 channels relay outputs (normal open; 2A@24VDC)	
GNSS (GPS Models)		
Supported GNSS Connector	GPS, Glonass, Beidou 1x SMA	
Other interfaces		
USB ports	2 x USB A Type (USB 2.0): 1-port High-Speed OTG + 1-port power only	
SD card	Micro-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 sample code	RS232, RS485, RTC, watchdog, LED, DI, DO, Buzzer, 3G/4G API, SMS, Button, network socket	
Power		
Input Voltage	9-48 VDC - reverse polarity protection	
Connector	3-Pin 5.08mm Lockable Terminal Block	
Power Consumption	0.6A @ 12VDC (7.2 W Max)	
Power Redundancy	USB DC 5V Power Input	
Environmental limits		
Operating Temperature Storage Temperature Ambient Relative Humidity	-40°C~70°C (-40°F~158°F) -40°C~85°C (-40°F~185°F) 5%~95%, (Non-condensing)	
Mechanicals		
Housing	IP30 protection, SPCC metal housing	
Dimensions(W x H x D) Weight	32mm x 122mm x 92mm 400 g	
Installation	DIN-Rail or Wall-Mount (optional kit)	
Reset Button	Yes	

DIMENSIONS & LAYOUT



REGULATORY APPROVALS

Regulatory Approvals				
Safety	EN 60950-1, UL60950-1, IEC60950-1			
EMC	FCC Part 15, Subpart B, Class A, FCC Part 22H / FCC Part 24E, FCC Part 27 EN 301 489-1/3/7/24, EN 301 908-1, EN 301 511, EN 62311, EN 300 440-1/-2 EN 303 413, EN 55024, EN 55032, EN61000-6-4, EN 61000-3-2, EN 61000-3-3, EN61000-6-2			
Test	**Item**		**Value**	**Level**
IEC 61000-4-2	ESD	Contact Discharge Air Discharge	±6KV ±8KV	3 3
IEC 61000-4-3	RS	80-1000MHz 1.4-2.0GHz 2.0-2.7GHz	10 V/m 3 V/m 1 V/m	3 2 1
IEC 61000-4-4	EFT	AC Power Port DC Power Port Signal Port	±2.0KV ±2.0KV ±1.0KV	3 3 3
IEC 61000-4-5	Surge	AC Power Port AC Power Port DC Power Port DC Power Port Signal Port	Line-to Line±1.0KV Line-to Earth±2.0KV Line-to Line±0.5KV Line-to Earth±0.5KV Line-to Earth±1.0KV	3 3 2 1 2
IEC 61000-4-6	CS	0.15-80MHz	10V rms	3
IEC 61000-4-8	PFMF	(Enclosure)	30 A/m	4
IEC 61000-4-11	DIP	AC Power Port	-	-
Shock	IEC 60068-2-27			
Drop	IEC 60068-2-32			
Vibration	IEC 60068-2-64			
RoHS	Yes			
MTBF	20.88 years according to MIL-HDBK-217F (Model average)			
Warranty	5 years			

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ORDERING INFORMATION

Ordering information		
Model name	**Part Number**	**Description**
SE5901B-4G-US	Contact Headquarter	1XRS232/485, 4G(US)
SE5901B-IO-4G-US	Contact Headquarter	2XRS232, 1xRS485, 4G(US), IO
SE5901B-IO-4G-GPS-US	Contact Headquarter	2XRS232, 1xRS485, 4G(US), IO, GPS
SE5901B-4G-B-US	Contact Headquarter	1XRS232/485, 4G(US)
SE5901B-IO-4G-B-US	Contact Headquarter	2XRS232, 1xRS485, 4G(US), IO, Battery
SE5901B-IO-4G-GPS-B-US	Contact Headquarter	2XRS232, 1xRS485, 4G(US), IO, GPS, Battery
SE5901B-4G-EU	Contact Headquarter	1XRS232/485, 4G(EU)
SE5901B-IO-4G-EU	Contact Headquarter	2XRS232, 1xRS485, 4G(EU), IO
SE5901B-IO-4G-GPS-EU	Contact Headquarter	2XRS232, 1xRS485, 4G(EU), IO, GPS
SE5901B-4G-B-EU	Contact Headquarter	1XRS232/485, 4G(EU)
SE5901B-IO-4G-B-EU	Contact Headquarter	2XRS232, 1xRS485, 4G(EU), IO, Battery
SE5901B-IO-4G-GPS-B-EU	Contact Headquarter	2XRS232, 1xRS485, 4G(EU), IO, GPS, Battery
SE5901B-IO	Contact Headquarter	2XRS232, 1xRS485, 4G(EU), IO

Optional Accessories		
Model name	**Part Number**	**Description**
UN315-1212(US-Y) LV6	505001511200003G	Y-Type (5.08 mm) adaptor, 100-240VAC input, 1.25A @ 12VDC output, US plug
UNE315-1212(EU-Y)LV6	505001511200013G	Y-Type (5.08 mm) adaptor, 100-240VAC input, 1.25A @ 12VDC output, EU plug
ADP-DB9(F)-TB5	59906231G	Female DB9 to Female 3.81mm TB5 Converter
WMK-315-Black	701000000000050G	Black Aluminum Wall Mount Kit
WL-7200-V1 WLAN Dongle	59908002G	802.11b/g/n 300M , USB Dongle