

SE5901 (SDK) Series

1-Port Industrial Ethernet to Serial Embedded Computer



FEATURED HIGHLIGHTS

- Ideal for IoT and IIoT applications; supports Node-RED and dashboard
- Wide -40°C~85°C temperature range for Industrial-grade reliability
- High-performance IPsec VPN throughput; data-rate up to 37.9Mbps*
- 2 x 10/100Mbps Ethernet port
- 1 x RS-232/422/485 port – baud rate up to 921.6 Kbps
- 1 x USB2.0 high speed OTG port
- Optional 802.3af PoE models can be powered by Ethernet cable
- ATOP customized Linux SDK environment with reliable APIs
- Rugged metal housing with wall or DIN-Rail mount support
- Industrial EMC protection

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 Serial and Ethernet connectivity in a reliable and powerful Industrial Grade platform 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

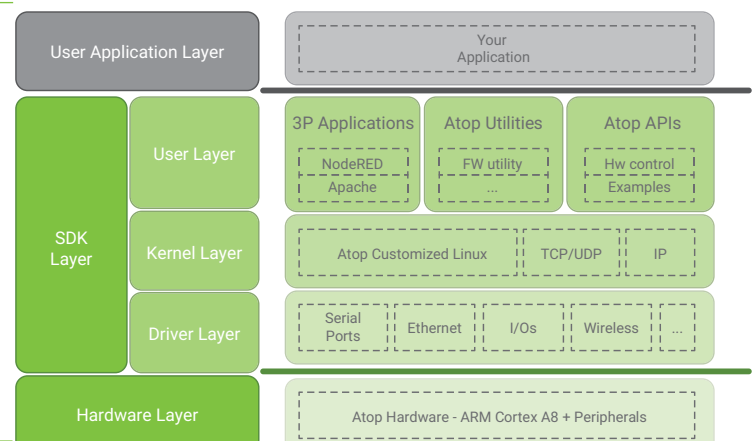
Write your customized application in C language and Run it on its powerful Industrial low-power 800MHz ARM Cortex A8 TI Sitara AM3354 CPU. Make flexible use of your peripherals, no matter storage, Serial, or USB are needed.

SE5901 is available as a Standard SDK or Node-RED version.

The Node-RED version, embedding a Node-RED USB pen-drive, adds to the powerful hardware platform, the possibility add the ATOP-Customized Node-RED environment and an user-friendly Device Configuration UI. Node-RED, an open source Building-Block programming environment, will allow you to build your IoT application from an user-friendly, hardware-tailored application design environment and dashboard.

Rugged and flexible for advanced developments

SE5901 embeds **high EMC protection**, **wide temperature operation**, programming and installation flexibility in one device. A dedicated **PoE version** allows you to power the device through Power over Ethernet (IEEE 802.3af) technology, without the need of a separate space consuming power supply.



*: Node-RED version only; test carried out with one VPN-IPsec Tunnel, Peer-to-Peer mode, Ethernet cable.

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.

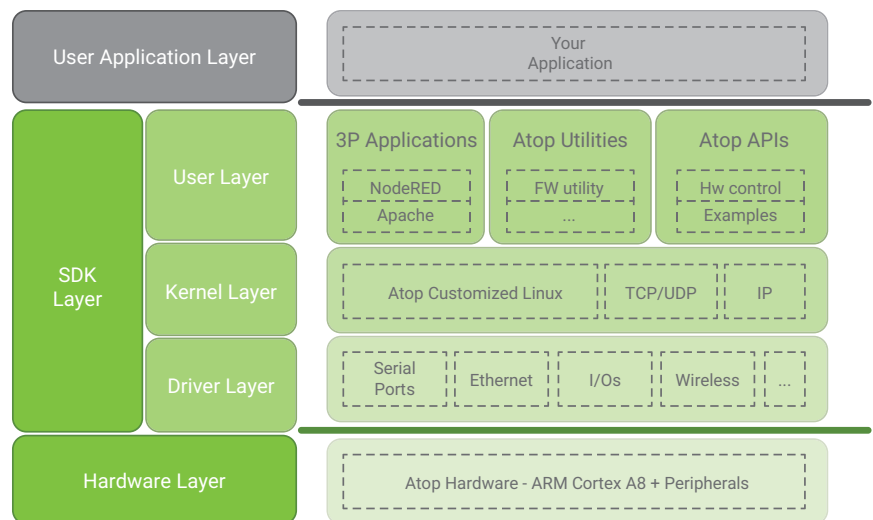
Here at ATOP, we understand these different needs and we are providing you different working models, based on what your needs are.

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 Ethernet, Serial, etc.) 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
- Example of source code

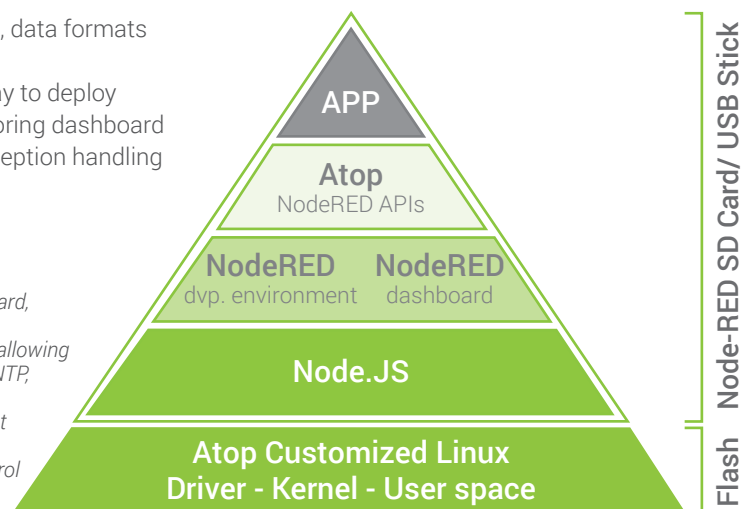


Use ATOP's Node-RED version with the preloaded USB Stick if:

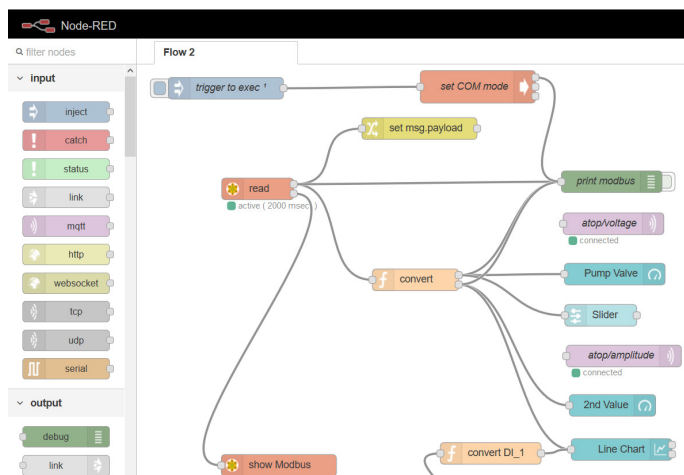
- You're hands-on, with a good understanding of protocols, data formats
- You have some basic Javascript knowledge
- You're looking for a simple, user-friendly and effective way to deploy your applications to the cloud, with a user friendly monitoring dashboard
- You don't have strict performance requirements, and exception handling is not critical

Our Node-RED version provides:

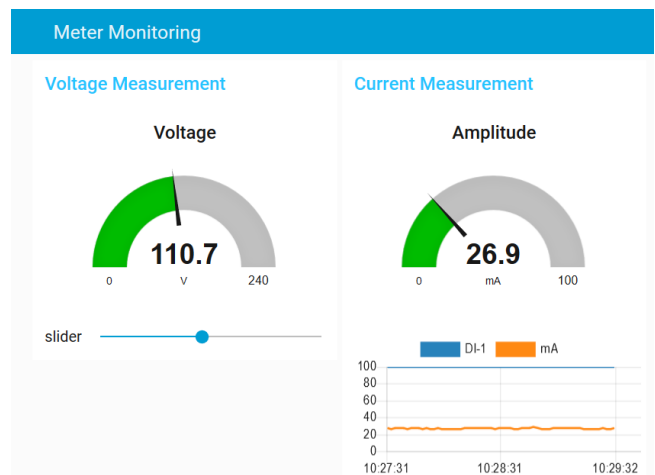
- Node-RED visual application development environment and dashboard, with automatic start on device boot-up, Node.JS based
- ATOP-customized dedicated Web-UI for user friendly device set-up, allowing you to create VPN tunnels, set-up the network settings, date/time, NTP, diagnostics and much more without using Linux command line.
- Different level of security to allow developers to access development environment and users to access dashboard only
- Customized Node-RED APIs (blocks) that will allow you to fully control ATOP powerful hardware and control Buzzer, diagnostics and much more
- Integrated Modbus and MQTT stacks, for seamless communication with field devices and cloud
- Integrated AWS, Azure, Google and IBM Bluemix Nodes.



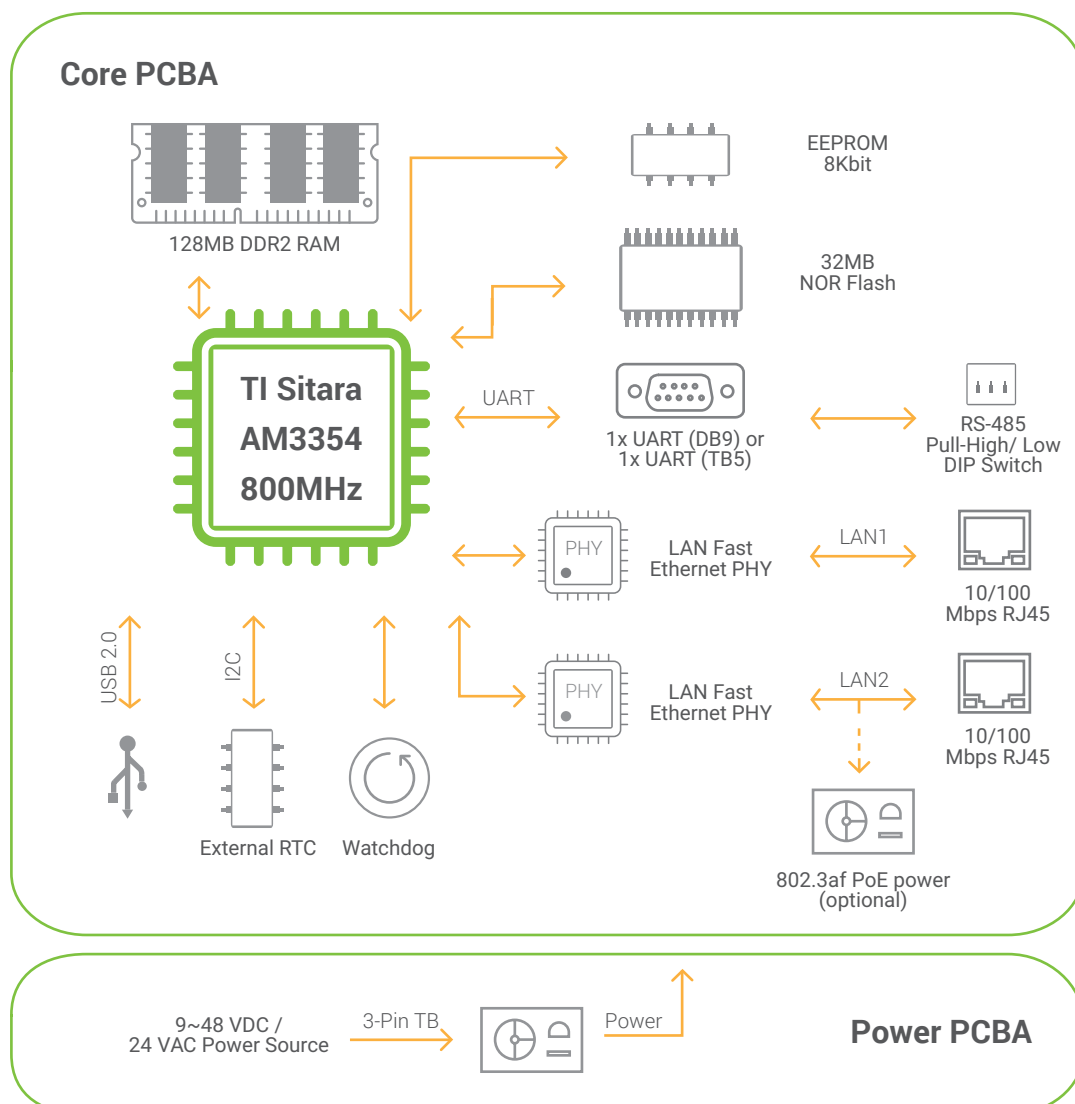
NodeRED development environment



NodeRED dashboard



BLOCK DIAGRAM

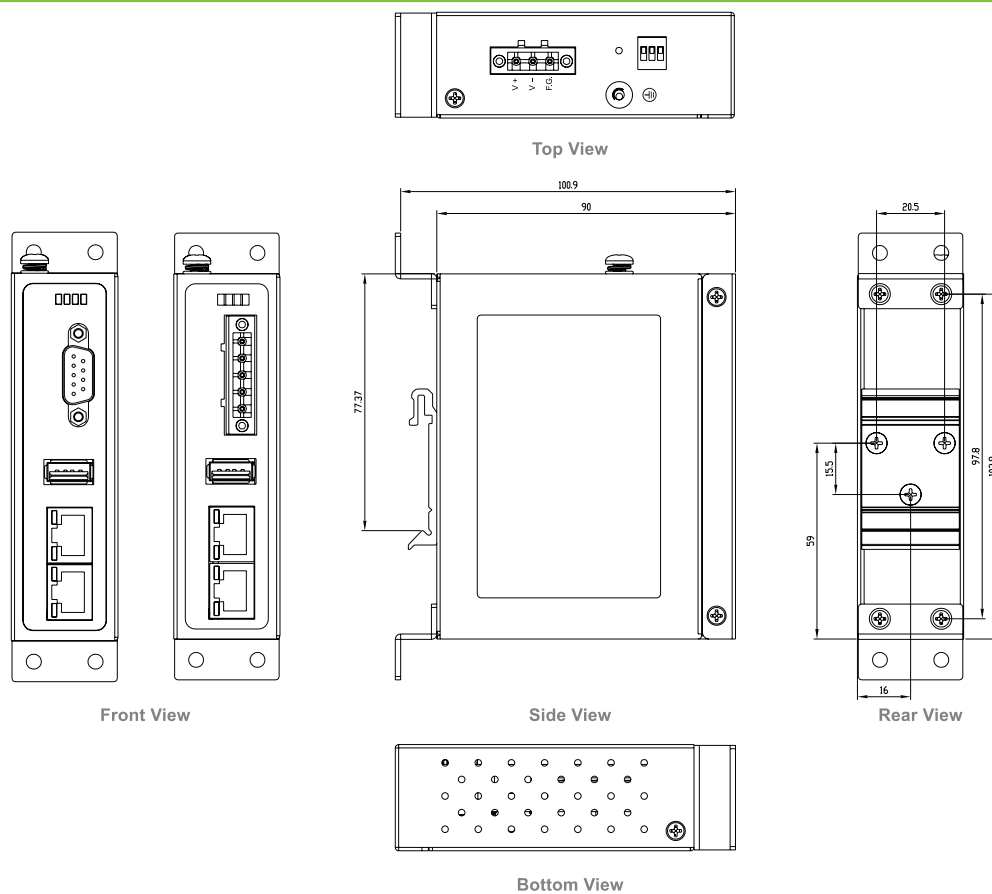


SPECIFICATIONS

Hardware Specifications		
CPU	Texas Instruments Sitara ARM Cortex A8 AM3354 800MHz	
Flash	16 MB NOR Flash (customizable upon request up to 128 MB) Node-RED version: 32 MB NOR Flash	
RAM	SDK version: 128 MB DDR2 (customizable upon request up to 256 MB) Node-RED version: 256 MB DDR2	
EEPROM	24LC64	
Watchdog	ADM706	
Real Time Clock (RTC)	Yes - with external chip	
Buzzer	Yes	
Console port	Yes - on-board connector	
Reset button	Yes	
Network Interface		
Standards	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X)	
Ethernet Ports	2x 10/100BASE-TX RJ-45	
Power over Ethernet	IEEE 802.3af on LAN2 (PoE version only)	
Serial Interface		
Connector	D-Sub9 RS-232/485 software selectable (DB model) 5-Pin 5.08mm Terminal Block	
Ports	1 port RS-232/422/485 (2 and 4-wire)	
Pull-high / Pull-low /Term. resistors	Selectable by DIP switch.	
Configuration	Baud Rate Data Bits Stop Bits Flow Control	50 ~ 921,600bps 7, 8 1, 2 None, Xon/Xoff, RTS/CTS (RS-232 only)
Other interfaces		
USB ports	1 x USB A Type (USB 2.0) - High-Speed OTG + power	
Software		
Bootloader	U-boot 2014.07	
Linux kernel	Linux 3.14.26	
Linux toolchain	Linux 32 bits toolchain gcc (C/C++ PC cross compiler), glibc	
Linux sample code	RS232, RS485, RTC, watchdog, LED, Buzzer, Button, network socket	
Additional features (Node-RED version only)	Pre-installed Node-RED USB stick, with auto-run on startup Dedicated Web UI for device settings Integrated DHCP, IPv4, NTP/SNTP client, SNMP v1/v2c/v3, OpenVPN client/server, IPsec, and PPTP.	
Power		
Input Voltage	9-48 VDC 24 VAC	

Connector	3-Pin 5.08mm Lockable Terminal Block
Power Consumption	0.65A @ 9VDC (6 W Max)
Reverse Polarity Protection	Yes
Environmental limits	
Operating Temperature	-40°C~85°C (-40°F~185°F)
Storage Temperature	-40°C~85°C (-40°F~185°F)
Ambient Relative Humidity	5%~95%, (Non-condensing)
Mechanicals	
Housing	IP30 protection, SPCC metal housing
Dimensions(W x H x D)	32 x 110 x 90 mm (1.26 x 4.33 x 3.54 in)
Installation	DIN-Rail or Wall-Mount (optional kit)
Weight	400 g
Reset Button	Yes

DIMENSIONS & LAYOUT



※ The wall mount kit illustrated in this document is for reference only and not included in the package.

REGULATORY APPROVALS

Regulatory Approvals				
Safety	EN60950-1:2006			
EMC	FCC Part 15, Subpart B, Class A EN 55032, EN 55024, EN 61000-3-2, EN 61000-3-3, EN 61000-6-2, EN 61000-6-4			
Test	Item		Value	Level
IEC 61000-4-2	ESD	Contact Discharge	±8kV	4
		Air Discharge	±15kV	4
IEC 61000-4-3	RS	Radiated (enclosure)	10 V/m	3
IEC 61000-4-4	EFT	DC Power Port	±2.0KV	3
		Signal Port	±2.0KV	3
IEC 61000-4-5	Surge	DC Power Port	Line-to Line±1.0KV	3
		DC Power Port	Line-to Earth±2.0KV	3
		Signal Port	Line-to Earth±2.0KV	3
IEC 61000-4-6	CS	Conducted (enclosure)	10 V rms	3
IEC 61000-4-8	PFMF	Enclosure	10 A/m	3
IEC 61000-4-11	DIP	Power Port	-	A
Shock Drop (Freefall) Vibration	IEC 60068-2-27 IEC 60068-2-32 IEC 60068-2-6			
RoHS II	Yes			
MTBF	21.16 Years, according to MIL-HDBK-217F			
Warranty	5 years			

ORDERING INFORMATION

Ordering information				
Software Type	Model name	Ethernet	Serial	Remarks
SDK version suffix: (SDK) Node-RED version suffix: -NR	SE5901-DB	2 (RJ45)	1 (DB9)	-
	SE5901-TB	2 (RJ45)	1 (TB)	-
	SE5901-PoE-DB	2 (RJ45)	1 (DB9)	PoE PD
	SE5901-PoE-TB	2 (RJ45)	1 (TB)	PoE PD

Optional Accessorie		
Model name	Part Number	Description
UN315-1212 (US-Y)	50500151120003G	Y-Type power adaptor, 100~240VAC input, 1.25A @ 12VDC output, US plug, LV6
UNE315-1212 (EU-Y)	50500151120013G	Y-Type power adaptor, 100~240VAC input, 1.25A @ 12VDC output, EU plug, LV6
ADP-DB9(F)-TB5	59906231G	Female DB9 to Female 3.81 TB5 Converter
WMK-315-Black	70100000000050G	Black Aluminum Wall Mount Kit



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