FEATURED HIGHLIGHTS

- Ideal for IoT and IIoT applications; supports NodeRED 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

SE5901 (SDK), 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.

And if C Programming bothers you, just add the Atop-Customized NodeRED environment USB-stick to be ready to Go. NodeRED is an open source Building-Block programming environment based on Node.js that will allow you to build your IoT application from an user-friendly, hardware-tailored application design environment.And if also need a user-friendly application dashboard, forget the burden of a HTML-based interface. NodeRED has already all you need.

User Application Layer	Your Application		
SDK Layer — User Layer	3P Applications: NodeRED, Apache	Atop Utilities: FW utility, ...	Atop APIs: Hw control, Examples
SDK Layer — Kernel Layer	Atop Customized Linux	TCP/UDP	IP
SDK Layer — Driver Layer	Serial Ports / Ethernet / I/Os / Wireless / ...		
Hardware Layer	Atop Hardware - ARM Cortex A8 + Peripherals		

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.
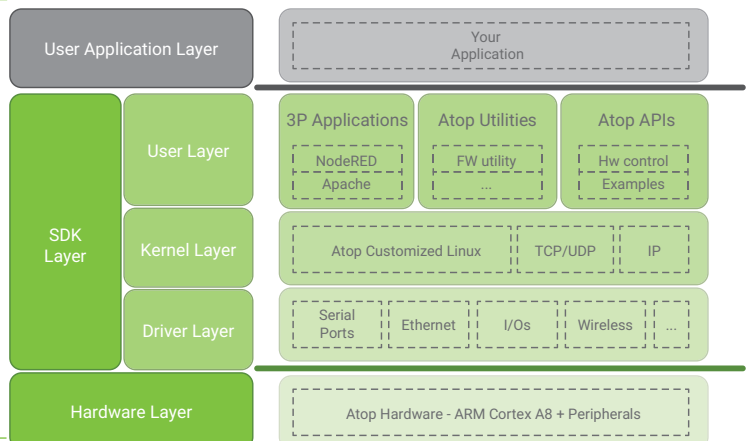
* : test carried out with one VPN-IPsec Tunnel, Peer-to-Peer mode, Ethernet cable.

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 Pure-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, Wireless) and integrated drivers*
- *Atop customized Linux Kernel and network protocols*
- *Ported, debugged and proven third party applications (such as Apache webserver)*
- *Utilities and APIs to control the hardware in an easy and effective way*
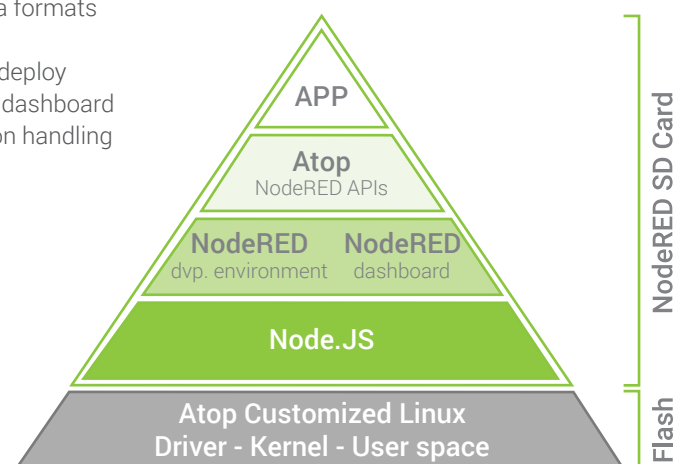- *Example of source code*
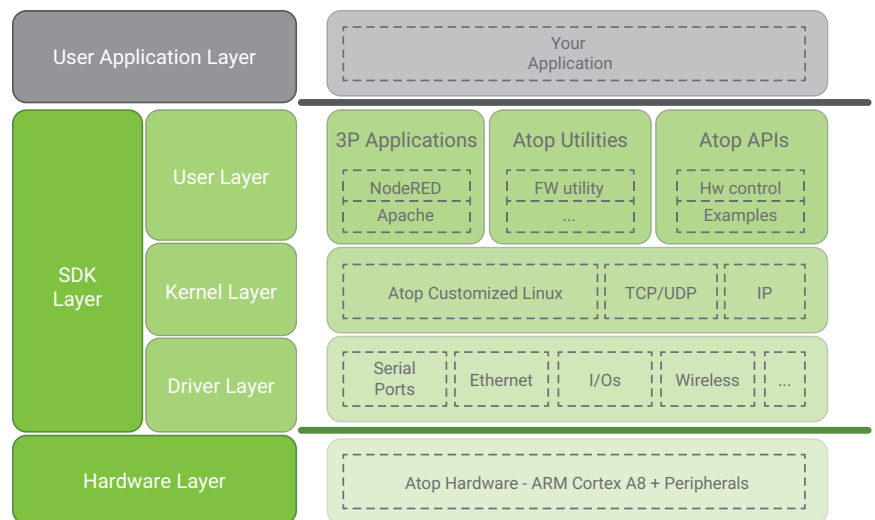
Use Atop's Standard SDK programmable ARM computer with NodeRED Add-ON USB Stick if:
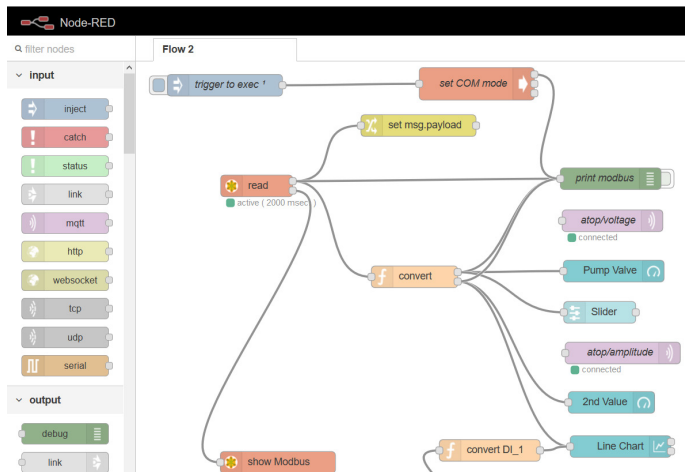
- You're hands-on, with a good understanding of protocols, data formats
- You have some basic Javascript knowledge
- You're looking for a simple, user-friendly and effective way to deploy your applications to the cloud, with a user friendly monitoring dashboard
- You don't have strict performance requirements, and exception handling is not critical
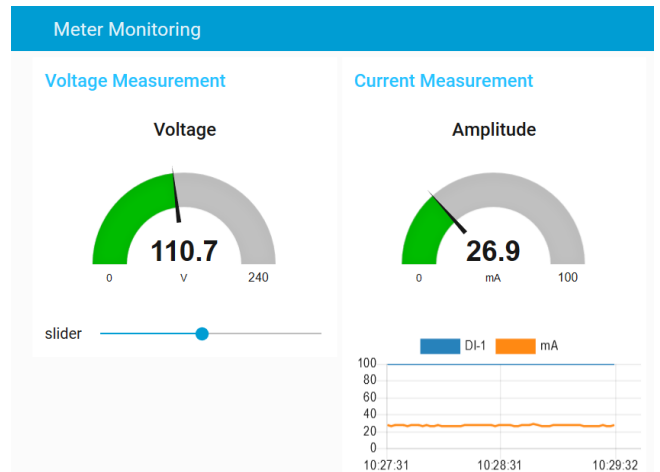
Our NodeRED USB Stick provides:

- *NodeRED visual application development environment and dashboard, with automatic start on device boot-up, Node.JS based*
- *Different level of security to allow developers to access development environment and users to access dashboard only*
- *Customized NodeRED APIs (blocks) that will allow you to fully control Atop powerful hardware and control inputs, relays, SMS, COM ports, Buzzer, diagnostics and much more*
- *Integrated Modbus and MQTT stacks, for seamless communication with field devices and cloud*
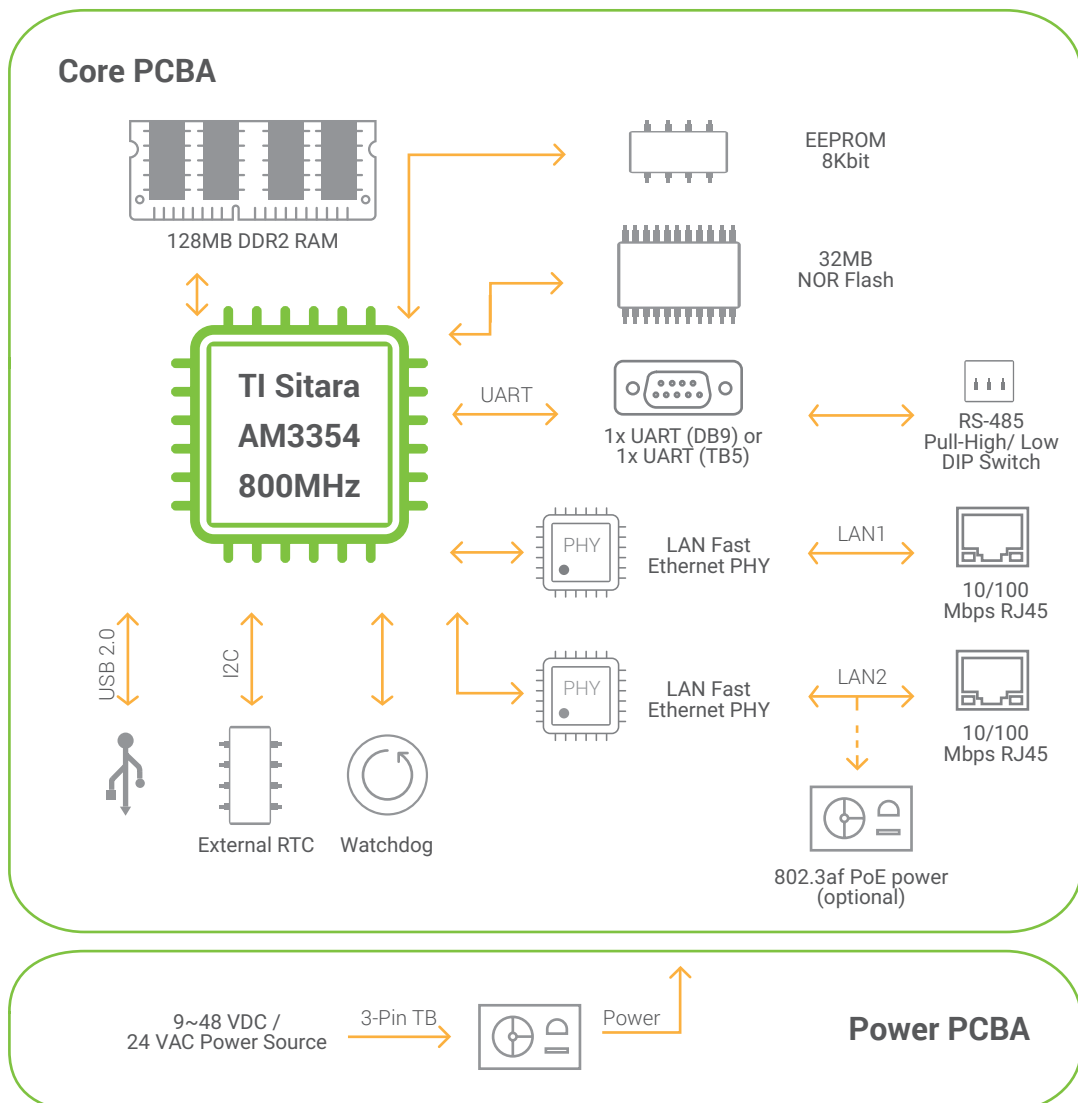
NodeRED development enrivonment

NodeRED dashboard

BLOCK DIAGRAM

Core PCBA

- 128MB DDR2 RAM
- EEPROM 8Kbit
- 32MB NOR Flash
- TI Sitara AM3354 800MHz
- UART
- 1x UART (DB9) or 1x UART (TB5)
- RS-485 Pull-High/ Low DIP Switch
- PHY — LAN Fast Ethernet PHY — LAN1 — 10/100 Mbps RJ45
- PHY — LAN Fast Ethernet PHY — LAN2 — 10/100 Mbps RJ45
- 802.3af PoE power (optional)
- USB 2.0
- I2C
- External RTC
- Watchdog

Power PCBA

9~48 VDC / 24 VAC Power Source — 3-Pin TB — Power

SPECIFICATIONS

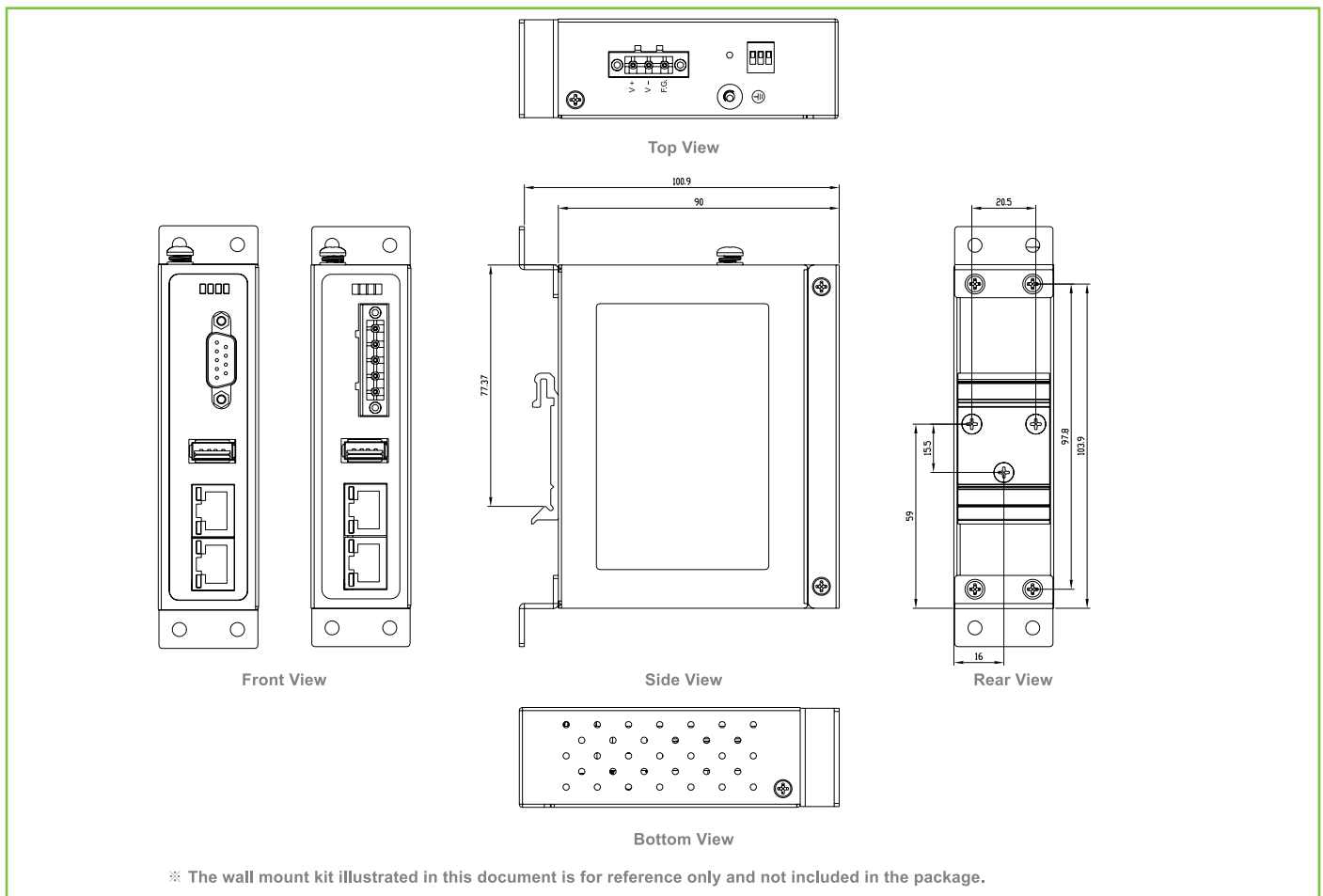| Hardware Specifications	
CPU	Texas Instruments Sitara ARM Cortex A8 AM3354 800MHz
Flash	16 MB NOR Flash (customizable upon request up to 128 MB)
RAM	128 MB DDR2 (customizable upon request up to 512 MB)
EEPROM	24LC64
Watchdog	ADM706
Real Time Clock (RTC)	Yes - with external chip
Buzzer	Yes
Console port	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 50 ~ 921,600bps Data Bits 7, 8 Stop Bits 1, 2 Flow Control 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
Visual development environment	NodeRED (optional on USB card)
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 Storage Temperature Ambient Relative Humidity	-40°C~85°C (-40°F~185°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)	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

Top View

100.9

90

77.37

20.5

15.5

97.8

103.9

59

16

Front View

Side View

Rear View

Bottom View

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

v: 0.2

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 Air Discharge	±8kV ±15kV	4 4
IEC 61000-4-3	RS	Radiated (enclosure)	10 V/m	3
IEC 61000-4-4	EFT	DC Power Port Signal Port	±2.0KV ±2.0KV	3 3
IEC 61000-4-5	Surge	DC Power Port DC Power Port Signal Port	Line-to Line±1.0KV Line-to Earth±2.0KV Line-to Earth±2.0KV	3 3 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	TBD			
Warranty	5 years			

ORDERING INFORMATION

Ordering information					
Software Type	**Model name**	**Ethernet**	**Serial**	**Remarks**	
Ethernet to Serial Gateway, embedded computer SDK version	SE5901-DB (SDK)	2 (RJ45)	1 (DB9)	-	
	SE5901-TB (SDK)	2 (RJ45)	1 (TB)	-	
	SE5901-PoE-DB (SDK)	2 (RJ45)	1 (DB9)	PoE PD	
	SE5901-PoE-TB (SDK)	2 (RJ45)	1 (TB)	PoE PD	

Optional Accessories		
Model name	**Part Number**	**Description**
USB_NodeRED	-	USB 2.0 Flash Drive, 4GB, NodeRED Libraries included
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