

# Secure S1 Cellular Routers & Gateways for Industrial IoT & Enhanced Networking

- ✓ In compliance with IEC 62443-4-2 SL1 requirements
- ✓ System integrity checks
- ✓ Advanced Intrusion Detection Control (AIDE)
- ✓ Secure boot
- ✓ Operating strong cryptographic algorithms
- ✓ Allowing safe Linux services only
- ✓ Trusted chain from production to operation



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# SECURE S1 CELLULAR ROUTERS & GATEWAYS

Secure boot, integrity checks, and compliance with the most up-to-date cryptographic and security recommendations. S1 Routers represent an entirely new standard in security and cybersecurity threats resistance for Advantech Cellular Routers.

In combination with hardware capabilities (CPU OTP memory) and hardened Linux ICR-OS, S1 Routers provide the simplicity of a web-based configuration with limited flexibility known from our standard product open platforms in exchange for a higher security level applied to S1 Routers. S1 Routers fitting to applications where compliance compliance (compliance does not mean formal approval) with IEC 62443-4-2 SL1 (level 1), BSI IT Security label rules, and others is required.

## S1 ROUTERS DIFFERENTIATION

	Selected differences between S1 Routers and standard	
	S1 Routers	Standard routers
Compliance with IEC 62443-4-2 SL1 (level), BSI IT Security label rules and requirements*	Yes	No
Secure boot	Yes	No
Read only filesystem with integrity checks	Yes	No
Default username	admin	root
Router App format	.raw	.tgz
Min password requirements	12 chars, 3 classes	6 chars, 1 class
Mandatory account lock	Yes	No
Available cryptographic algorithms**	strong only	both weak and strong
Web Admin	HTTPS only	HTTP and/or HTTPS
OpenVPN Security Level	2 (medium) .. 5 (very high)	0 (weak) .. 5 (very high)
FTP, Telnet	No	Yes
FW Support End indicator	Yes	No
Advanced Intrusion Detection Environment (AIDE)	Yes	No
Encrypted firmware image	Yes	No
Using scripts***	No	Yes
Root access (sudo)	limited set of commands	full
Wi-Fi AP/Station "Extra Options"	No	Yes
HTTP Content-Security-Policy	strict	permissive
Persistent syslog	mandatory	optional
IPsec aggressive mode	No	Yes
Persistent data storage	combined (/var)	router apps (/opt), user data (/var/data)

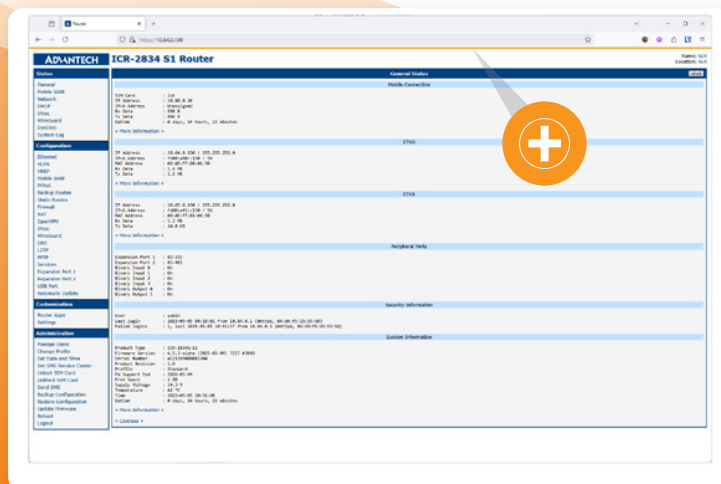
\* Compliance does not mean formal approval.

\*\* Weak algorithms: strength < 128 bits (e.g. DES, 3DES, MD5, SHA-1, RSA-1024/2048) Strong algorithms: strength ≥ 128 bits (e.g. SHA-256+, RSA-3072+, ED25519)

\*\*\* The only way to use scripts is to convert required scripts into S1 Router Apps.

## S1 ROUTERS GUI

What we keep the same is the familiar look of the S1 Routers' web interface for configuration. So the customer can operate a familiar interface with logical segmentation into categories



S1 Routers Web Interface (orange line)



Web interface of routers with standard firmware (green line)

# S1 ROUTERS AVAILABILITY AND PRODUCTION

**S1 Routers are available in just as selected router models. You can easily identify them by the “-S1” extension at the end of the PN name (eg, ICR-2734-S1).** It is possible to increase the list for other PN's, depending on project volume and technical fit (not all routers within our production range can be modified to be S1 Routers) After the agreement. Then the new PN needs to be created for ordering.

During a lifecycle, S1 Routers can benefit from regular updates we provide for this product group by using a dedicated firmware branch called ICR-OS S1 available at the website. As said above, uploading on standard units is not possible. ICR-OS S1 firmware branch is developed to work only in connection with S1 Routers.

## S1 ROUTERS COMPATIBILITY

S1 Routers do not allow scripting natively because of security reasons as standard products; **however, it is possible to extend the standard firmware functionalities by well known Router Apps.** Router Apps differ from the ones used for standard ICR-OS firmware, so it is necessary to use dedicated S1 Router Apps ending with extension .raw. Customer can also produce its own S1 Router Apps in .raw format – in this case developer bears their own responsibility for the security of such developed software.

It is also possible to use S1 Routers in combination with other routers and various monitoring or management systems when the communication scenario in the application allows it (see chapter S1 Router Differentiation mentioned earlier).

Check the list of available S1 Router Apps here:



## FAQ

### Are there any differences in GUI between standard products and S1 Routers?

The GUI looks the same, so it will be very familiar to any user of our current routers. For standard users using the GUI for configuration, there is virtually no impact between the standard product and S1 Routers. You will notice you configure S1 Router by “S1” indication in the router model name in the web GUI and by the orange colour of S1 Routers GUI that differs from the standard production web GUI (green).

### Is it possible to make an S1 Router from any cellular router in the Advantech portfolio?

No, this is not possible. S1 Routers require the OTP part of the memory that is not available for all Advantech routers. If you need another product than the currently available S1 Router, then contact the producer.

### If I have Advantech routers already in the network. Is it possible to update them to be S1 Routers?

No, this is not possible. Routers need to be ordered as S1 Routers and produced as S1 Routers directly in Advantech production.

### I am currently operating scripts on standard Advantech routers – can I operate the scripts with S1 Routers?

There are no scripts available for S1 Routers for security reasons. When you need to customize router behavior with additional scripts, it is possible to produce a Router App for S1 Routers in .raw format and upload it to the router/routers.

### Would I use Router Apps for standard Advantech routers on S1 Routers?

No, it is not possible. It is possible to use S1 Router Apps developed directly for S1 Routers ending with .raw extension.

### Is there IEC 62443-4-2 SL1 (level 1), BSI IT Security label certification available for S1 Routers?

S1 Routers are produced in line with the recommendations of above mentioned certifications. However, formal certification is not available. For currently available or planned formal certification for selected PN, consult the datasheet or Advantech specialists who provide you with the required information.

### Is the firmware for S1 Routers regularly updated?

Yes, the firmware is continually developed to react to the latest security recommendations while targeting to improve customer experience as well. The firmware update is done in the same way as on standard products using the dedicated ICR-OS S1 firmware branch.

Engineering Portal  
online version:



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