



WHITE PAPER:

Deploying Razberi ServerSwitchIQ™ Rugged Appliance in Remote and Harsh Environments



An increasing number of surveillance applications require that surveillance equipment must be protected from the elements and tampering by housing it within an IP rated and/or NEMA rated enclosure. Depending on the environment, these enclosures must be able to withstand many environmental factors including: dust, rain, snow, ice, chemicals, sunlight, extreme temperatures and vandalism.

The Old (Expensive) Way

Prior to the availability of the ServerSwitchIQ™ Rugged appliance from Razberi Technologies, the deployment of surveillance equipment into remote or harsh environments consisted of a very expensive cobbled together solution with standard server-room grade electronics. Without a better solution, these electronics were being placed into environments which they were never designed for. The result was a constant struggle of reliability and servicing of the equipment, usually at the expense of the integrator.

Compounding this challenge is the fact that many installations were utilizing 2 or 3 devices to manage what a single ServerSwitchIQ Rugged all-in-one appliance is able to handle. With a built-in managed PoE switch, storage and server, ServerSwitchIQ Rugged allows integrators to design and install more cost effective and smaller, space-saving systems. This is particularly important when space, such as inside an enclosure, comes at a premium.

Feeling the Heat

Two of the most common elements to protect against actually work against each other. While protecting from moisture can be achieved through airtight enclosures with a high IP-rating, this has the opposite effect on the system's ability to deal with high temperatures. To counter this, integrators were often left with one option: deploying very expensive enclosures with air-conditioning and hoping the fans on the electronics didn't fail.

Some integrators have taken an alternate approach by deploying higher specification servers, switches and power supplies to deal with tough thermal conditions. While it performs better than off the shelf equipment, these solutions dramatically increased the cost of deployment, making them less economically viable.



The ServerSwitchIQ Rugged Cost Advantage

- Air conditioning (AC) modules double the cost of the enclosure (\$1,500-2,000)
- AC modules need to be replaced every 2-3 years due to their 24x7 operation
- Additional power is required to run the AC module
- Cost of an enclosure required for AC module can be 3X higher
- AC servicing costs must be added to customer price or borne by integrator
- More moving parts = more potential for failure
- Standard IT equipment requires larger enclosures which cost more

The ServerSwitchIQ Rugged Difference – Economical & Cool

With features such as an SSD for video storage, the fan-less & dust-proof enclosure and optimized thermal management, the ServerSwitchIQ Rugged appliance was designed and purpose-built specifically to endure harsh environments. Built with components that are designed and tested for operation in high temp environments, the ServerSwitch IQ Rugged does NOT require an enclosure with air conditioning for ambient temperatures up to 60°C.

When you begin to add up the total cost of deploying a non-ruggedized solution, or one that requires AC, the cost savings of using Razberi's rugged appliance become clear as shown in Table 1. These cost savings are realized immediately upon installation – saving at least \$2,500 over a non-Razberi solution. Over 5 years, the savings are even more substantial, with the cost of deploying a ServerSwitchIQ Rugged appliance equal to only a third of what it would cost to deploy a non-Razberi solution.

	Non-Razberi Solution	ServerSwitchIQ Rugged Solution
Industrial Grade Server & Storage	\$2,000	\$3,000
Switch	\$500	Included in appliance
Enclosure	\$1,500	\$500
AC Module	\$2,000	Not required
AC Module Replacement	\$2,000 (2-3 years)	n/a
AC Servicing Plan	\$240/year	n/a
Total Initial Cost	\$6,000	\$3,500
Total 5yr Cost	\$9,200	\$3,500
Using Razberi Rugged solution saves \$5,700 over 5yrs		

Table 1: Rugged Solution Cost Comparison

Choosing an Enclosure

Combined with the right enclosure to protect the appliance and other electronics from water, dust and tampering, the ServerSwitchIQ Rugged is the basis for the most cost effective and reliable remote surveillance solution.

Standard enclosures are available in all different sizes, composing different materials and offering different capabilities. Many enclosures are rated using the Ingress-Protection (IP) or NEMA (National Electronic Manufacturers Association) rating scales.

Typical 'Rugged' Enclosure



Typical NEMA 4 stainless steel enclosure

IP Rating

The IP rating is formatted as "IP" followed by two digits. The first digit indicates a protection level against solids such as dust and the second digit indicates a protection level against liquids. Table 2 illustrates the IP formats (in simplified form). Please refer to the IEC specifications directly for more details.

Protection from Solid Objects		Protection from Moisture	
0	Not protected	0	Not protected
1	Larger than 50mm	1	Dripping water
2	Larger than 12mm	2	Dripping water when tilted 15°
3	Larger than 2.5mm	3	Water spray
4	Larger than 1.0mm	4	Water splash
5	Dust protected	5	Water jets
6	Dust proof	6	Strong water jets
		7	Immersion up to 1.0m deep
		8	Immersion >1.0m deep

Table 2: IP rating scale

Using the table above, an IP65 rating means:

- Solid Particle Protection = No ingress of dust; complete protection against contact.
- Liquid Ingress Protection = No ingress of water from a source such as water jets.

This level of protection is sufficient for most video surveillance installations.



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NEMA Rating

NEMA defines similar standards for various grades of electrical enclosures used in industrial applications. A typical NEMA enclosure might be rated to provide protection against environmental hazards such as water, dust, oil, coolant or environments with corrosive agents. Table 3 illustrates the NEMA ratings (in simplified form). Please refer to the NEMA specifications directly for more details.

Using the NEMA table below, a NEMA 4X rated enclosure means:

- Weatherproof, dustproof, waterproof and corrosion resistance.

A NEMA 4X enclosure is very similar to an enclosure bearing an IP67 rating.



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	NEMA Rating									
Provides a Degree of Protection Against Condition Type	1	2	3	4X	5	6	6P	12	12K	13
Access to hazardous parts	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ingress of solid foreign objects (falling dirt)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ingress of water (dripping and light splashing)		✓	✓	✓	✓	✓	✓	✓	✓	✓
Ingress of solid foreign objects (circulating dust, lint, or fibers)			✓	✓		✓	✓	✓	✓	✓
Ingress of solid foreign objects (settling airborne dust, lint, or fibers)			✓	✓	✓	✓	✓	✓	✓	✓
Ingress of water (house down and splashing)			✓	✓		✓	✓			
Oil and coolant seepage								✓	✓	✓
Oil and coolant spraying and splashing										✓
Corrosive agents				✓			✓			
Ingress of water (temporary submersion)							✓			
Ingress of water (prolonged submersion)							✓			

Table 3: NEMA rating scale

Factors to Consider When Selecting an Enclosure

Each installation may be quite different. Climate, location, point of installation and types of risks may all play a factor into determining what type of enclosure should be utilized. An installation may have to consider the following:

ENVIRONMENT:

Indoor, outdoor, industrial, hazardous, heavy duty, vandal prone.

CONDITIONS:

Dust, rain, snow & ice, chemicals, sunlight, extreme temperatures.

LOCATION:

Mounting restrictions, access to power and communication.

ADDITIONAL ELECTRONIC EQUIPMENT:

In addition to the ServerSwitchIQ Rugged and it's power supply, what else is potentially required for communication, power, access control, or telemetry?

These factors will have to be considered when choosing an enclosure. Given that enclosures can vary widely in size, material, NEMA/IP ratings, and form factors – there will be plenty of flexibility.

Recommended Enclosures

To make it easier, Razberi Technologies has identified a number of enclosures to consider for most installations (Table 4). If further guidance is required, engineers will help you select an enclosure which will protect your Razberi ServerSwitchIQ Rugged appliance and other equipment from the elements.

	Hoffman/Pentair	Schneider	Milbank	Wiegmann
Enclosure Model	A20H2006SS6LP	NSYPLM54	M4XS202006	N412202006CST
Rating	NEMA 4X	NEMA 4X / IP66	NEMA 4X	NEMA 4/12/13
Dimensions (inches)	20 x 20 x 6	20 x 17 x 8	20 x 20 x 6	20 x 20 x 6
Back Panel	A20P20	DIN Rail	A-20P20	NP2020C
Pole Mount	CPMK20	NSYSFP400	3 rd Party	3 rd Party

Table 4: Recommended enclosures

The Reliable, Rugged Solution

If you have a video surveillance installation that's going to be exposed to the elements, then you have to take the extra steps to ensure the equipment is protected. The best way to protect it is to deploy a solution that's hardened and reliable. By enclosing the Razberi ServerSwitchIQ Rugged in a NEMA or IP rated enclosure, you can be confident that no matter where you need to deploy it, it's going to work.

ServerSwitchIQ Features

- All-in-one server, managed PoE switch and storage
- Fanless-design protects mission critical surveillance from dirt and dust
- Hardened out-of-box for unconditioned dry remote and perimeter environments
- Extended temperature support from -40°C to 60°C (-40°F to 140°F)
- UL and CE certified



Contact Razberi Technologies today to request a demonstration and discover what the intelligent surveillance appliance can do for you at: www.razberi.net

Razberi is the leading provider of intelligent surveillance appliances. Razberi ServerSwitchIQ™ is a complete line of all-in-one, scalable appliances that combine a managed PoE switch, server, storage and intelligence. All Razberi appliances are open-architected to work with world class video management systems (VMS) out of the box. Intelligent features include VyneWatch™ health monitoring and LocBerj™ cyber security features to lock down vulnerable ports. By deploying Razberi appliances in a distributed architecture near the edge of the network, megapixel video impact on the network is reduced by up to 95%. Learn more at: www.razberi.net

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Americas: 469-828-3380
UK/EMEA: 0203 773 3689
salesinfo@razberi.net

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