

# S2 NetBox™ Architecture

Application Information for Version 3.1 and later

## Feature Summary

- IP-based, solid state network appliance (wired or wireless)
- Web-based user interface with common web browsers
- S2 Network Controller available in standard and XL sizes
- Requires no software to be installed on client computers
- Modular blades customize and expand system capability
- Fully distributed, ODBC-compliant database on-board
- Embedded, web server and application software
- DHCP or static IP address assignment
- Automatic device discovery for devices on local subnet
- SSL data protection for browser sessions
- SHA-1 authentication protects network node communication
- Network attached storage (NAS) or FTP for off-board backup
- Integrated XML-based API over HTTP, HTTPS
- Graphical configuration of system components
- One-step software updates loaded over the network
- Integrated online collaborative technical support
- Linux operating system on network controller
- Auto-addressing I<sup>2</sup>C bus connects application blades

## Overview

The S2 NetBox™ implements a fully distributed, solid state IP network appliance architecture. The S2 Network Controller (S2NC) is the server for multiple network nodes and includes an embedded software suite with web server, ODBC-compliant database management system, and embedded application software suite. All user operation is accomplished using a web browser and all content is served by the S2NC. To support the widest range of applications, network controllers are available in two capacities, standard and XL.

One or more IP-connected S2 Network Nodes (S2NN), each capable of supporting up to seven (7) Application Blade Modules, provide security device terminations. Nodes that share a subnet with the S2NC are automatically discovered, simplifying configuration; no switches or jumpers are used. Nodes not on a common subnet are configured with the provided setup utility, allowing them to be placed anywhere a network can reach.

Application Blade Modules connect physical security devices such as card readers, alarm points, and temperature points to the network nodes. Access control readers support the industry standard Wiegand protocol; inputs are quad-state (open, short, normal, alarm) alarm monitoring points; outputs are form C relays suitable for driving electric door operators; and, temperature points are 8 bit analog points accurate to within 0.5°C. The S2 NetDoor MicroNode is a unique device that supplies all connections necessary for two fully access controlled doors and can be powered externally or through PoE – including electric strikes – for a single cable connection.

Software for the entire system is embedded in flash memory and updates are delivered online and completed in a single operation. Data storage is provided in flash ROM, removable compact flash, or over the network using network attached storage (NAS) or FTP.



The S2 NetBox communicates with digital video recorders (DVRs) and IP video cameras using the IP network. Because processing takes place as close to the network edge as possible, failure of any single component does not compromise other components in the system. The solid state design of the S2 NetBox further ensures a superior MTBF (mean time between failures) compared to older client server architectures. Should support be required, the integrated collaboration software connects the user to S2's online technical support personnel.

Communication over networks is protected to ensure privacy and authenticity. SSL is available for communication between the S2NC and web browser, and every message between an S2NN and the S2NC contains a unique, secure message authentication code, allowing use of public networks where desired. The S2 NetBox supports application extension through its web-based API using XML-formatted commands sent to the S2NC with HTTP calls. Message authentication codes assure authenticity and SSL further secures message traffic.

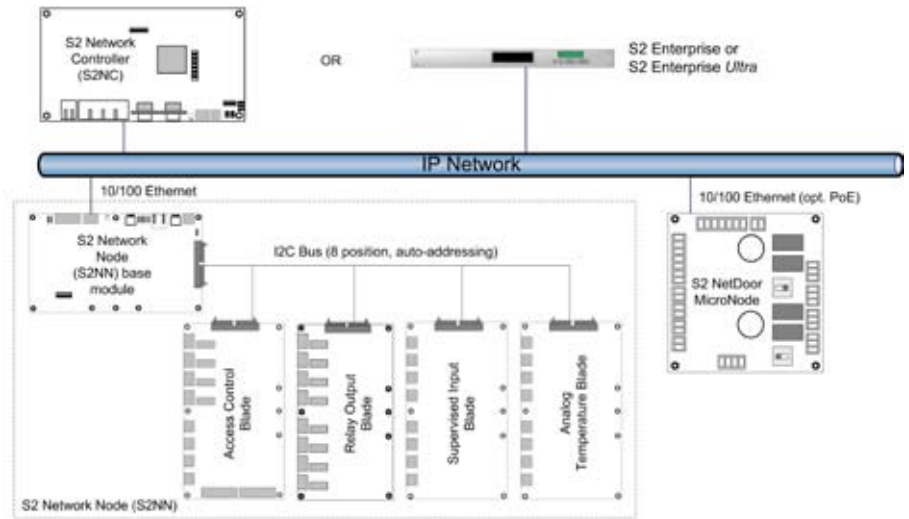
# Architecture in Detail

The S2 Network Controller (S2NC) is a solid state network appliance that acts as a server for an S2 NetBox system. It hosts the web server, database server, data storage, and application logic. For larger applications, the S2 NetBox XL replaces the S2NC and provides up to 10X the throughput. XL systems are supplied as a 2U rack mount and include redundant internal hard disk storage.

S2 Network Nodes (S2NN) are the connection points for card readers, monitoring points, relay outputs, and temperature points. Several enclosure styles are available for S2 NetBox components:

Enclosure	Blades	H	W	D
*Std. wall mount	7	17"	15"	6.75"
Small wall mount	2	12"	12"	5.00"
*Rack mount	7	7"	17"	15.0"
MicroNode		7"	7"	3.5"

\* Available in UL 294-listed configuration.



The S2 NetDoor MicroNode supports 2 access control readers, 4 supervised inputs, 4 relay outputs, a temperature point, and a 12VDC output for driving REX devices. It can be powered by 12 VDC or PoE and can power electric strikes without an additional supply.

S2 NetBox Application Modules, or blades, connect to the I2C bus of an S2 Network Node. Blades are automatically recognized by the node, and addressed without jumpers or switches. Four different blade types are available:

Blade Module	Inputs	Outputs	Readers	Temp pt
Access control	4	4	2	-
Alarm input	8	-	-	-
Relay output	-	8	-	-
Temperature	-	-	-	8

## Specifications

### S2 Network Controller (standard)

Network nodes supported	32
Processor	Intel IXP425
RAM memory	128 MB
Flash ROM memory	48 MB
Compact flash (CF) memory	8 GB (max.)

### S2 Network Controller (XL)

Network nodes supported	128
Processor (minimum)	1 GHz Celeron
RAM memory (minimum)	1 GB
Mirrored hard disk drives (minimum)	60 GB

### S2 Network Node (S2NN)

Blades per network node	7
RAM memory / Flash ROM	4 MB / 2 MB
IP address determination	static or DHCP
Serial interfaces	1
Temperature precision (range)	0.5°C (0° - 70°C)

### S2 NetDoor MicroNode

Access control readers	2
Supervised input points	2
Relay controlled outputs	4 (2 wet/dry selectable)
Temperature points	1

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