

# S2 NetBox™ Architecture

Application Information for Version 4.1

## Feature Summary

- IP-based, network appliance architecture
- Web-based user interface with common web browsers
- Requires no software to be installed on any computer
- Modular blades customize and expand system capability
- Fully distributed, ODBC-compliant database
- Embedded, web server and application software
- DHCP or static IP address assignment
- Automatic device discovery for devices on local subnet
- Digitally signed historical archive of all system activity
- 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
- LDAP/Active Directory user authentication
- Supports components in multiple time zones

## 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 including a web server, ODBC-compliant database management system, and embedded application software suite. All user operation is accomplished through a web browser and all content is served by the S2NC. To support the widest range of applications, network controllers are available in two models, the solid state *S2 NetBox* and the high capacity, disk-based *S2 Enterprise*.

One or more IP-connected solid state *S2 Network Nodes (S2NN)*, each capable of supporting up to seven (7) *S2 Application Blade Modules*, provide security device terminations. Nodes that share a subnet with the S2NC are automatically discovered and configured from software, simplifying installation. Nodes not on a common subnet are configured with the provided setup utility, allowing them to be placed anywhere a network can reach - even in multiple time zones.

Application Blade Modules connect physical security devices such as card readers, alarm points, relays, and temperature points to the network nodes. Access control readers support the industry standard Wiegand protocol; inputs are quad-state (open, short, normal, alarm) monitoring points; outputs are form C relays suitable for driving electric door operators; and, temperature points are 9 bit analog points accurate to within 0.5°C. The *S2 NetDoor MicroNode* is a compact network node that supplies all connections necessary for two fully access controlled doors and can be powered externally or through PoE – including electric strikes – for a true single cable integration.

Software for the entire system is embedded in the network controller. Updates are delivered online and completed in a single operation. Data storage is provided in flash ROM, removable compact flash, disk,



Several enclosure options are available for S2 NetBox systems.

or over the network using network attached storage (NAS) or FTP.

The S2 NetBox communicates with digital video recorders (DVRs and NVRs) 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. The complete historical event archive is digitally signed to assure forensic integrity.

# Architecture in Detail

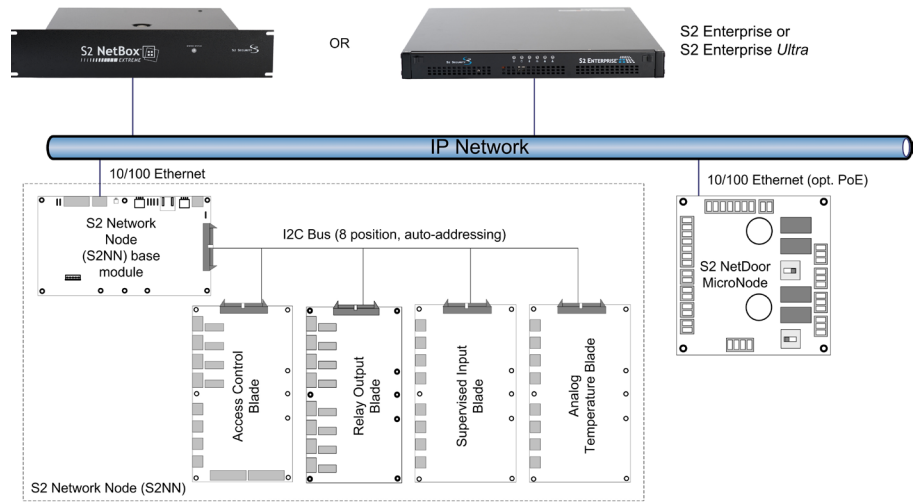
The S2 Network Controller (S2NC) is a solid state network appliance that acts as a server for an S2 NetBox system. It hosts the web server, database server, data storage, and application logic. For larger applications, the S2 Enterprise replaces the S2NC and provides up to 10X throughput. Enterprise systems are supplied as either a 1U rack mount unit or a 2U unit that includes 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"
*Rack mount	7	7"	17"	15.0"
MicroNode		7"	7"	3.5"

\* Available in UL 294-listed configuration.

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:



*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.*

Blade Module	Inputs	Outputs	Readers	Temp pt
Access control	4	4	2	-
Alarm input	8	-	-	-
Relay output	-	8	-	-
Temperature	-	-	-	8
MicroNode	4	4	2	1

## Specifications

### S2 Network Controller (standard)

Network nodes supported	32
Processor	TI OMAP 3503
RAM memory	256 MB
SLC SD Card	4GB

### S2 Network Controller (S2 Enterprise)

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	2 MB
IP address determination	static or DHCP
Temperature precision (range)	0.5°C (0° - 70°C)
Temperature operating range	0°C - 50°C

### S2 NetDoor MicroNode

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

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