# Nano SocketLAN™
### Miniature embedded  secure 10/100BaseT Ethernet module

## General Description:

Nano SocketLAN™ is a secure embedded Ethernet module that enables installed devices to connect to the IP Networks over a 10/100BaseT Ethernet LAN. It includes the iChip™ CO2144 IP Communication Controller™ chip and a 10/100BaseT Ethernet PHY with on-board RJ45 connector, and is packaged in a 35x24 mm RoHS-compliant low profile form factor.

Nano SocketLAN makes adding LAN connectivity to embedded devices a breeze. It does not require any kind of IP stack or driver development on the host CPU and its multiple interfaces (UART, SPI and USB) minimize the need to redesign the host device hardware.

Connect One's high-level AT+i™ API eliminates the need to add LAN drivers, security or networking protocols and tasks to the host application.

Nano SocketLAN supports the SSL3/TLS1 protocol for secure sockets, HTTPS and FTPS.

Nano SocketLAN firmware and configuration parameters are stored in on-board flash memory. The module is power-efficient: the core operates at 1.2V, while I/Os operate at 3.3V.

The Nano SocketLAN contains a pin to pin compatible connector to Connect One's Nano Socket iWiFi Module, allowing a seamless swap between the two modules. Customers are now able to design embedded devices to connect using either LAN or WiFi, simply by adding the correct module.

## Typical applications:

❖ Connecting serial embedded devices to 10/100BaseT LAN
❖ Adding SSL security to M2M solutions
❖ For dual mode (LAN/WiFi) solutions – same footprint as Nano Socket iWiFi

Nano SocketLAN supports several operation modes:

- SerialNET™ Serial to LAN Bridge - allowing transparent bridging of Serial over LAN, using the 3Mbps fast UART. This is a true plug-and-play mode that eliminates any changes to the host application.
- PPP modem emulation – allowing existing (e.g. modem) designs currently using PPP to connect transparently over LAN
- Full Internet Controller mode – allowing simple MCU to use the Nano SocketLAN's rich protocol and application capabilities to perform complex Internet operations such as E-mail, FTP, SSL, embedded web server and others. It also acts as a firewall, providing a security gap between the application and the network.

As product volumes increases, customers may realize significant cost savings by switching to an on-PCB design using iChip CO2144/2128/2064. The transition is seamless as no changes are required to the application. Reference designs and additional information for this transition are available on www.connectone.com

The II-EVB-363MS evaluation board provides an easy environment for evaluating the Nano SocketLAN and can also be used to evaluate the Nano Socket iWiFi.

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## *Hardware Description:*

- Size: 35.0 x 24.88 x 17.4 mm
- Core CPU: Connect One CO2144 32-bit RISC, low-leakage, 0.13 micron, at 48MHz
- Operating Voltage: +3.3V+/-10%
- Operating Humidity: 90% maximum (non-condensing)
- Operating Temperature Range: -40°c to +85°c (-40° to 185°F)
- Power Consumption:
  - 130mA Typical (150mA max)
- Connectors:
  - 2x10 pin header
  - RJ45 with two LED indicators
- Host Interface: Serial, SPI and USB device.
- RoHS-compliant; lead-free

## *Performance Specifications:*

- Host Data Rates:
  - UART: Up to 3Mbps
  - SPI: Up to 12Mbps
- Serial Data Format (AT+i mode): Asynchronous character; binary; 8 data bits; no parity; 1 stop bit
- Serial Data Format (SerialNET mode): Asynchronous character; binary; 7 or 8 data bits; odd, even, or no parity; 1,1.5,2 stop bits

- Flow Control: Hardware (-RTS, -CTS) and software flow control.

## *Internet Protocols:*

- ARP, ICMP, IP, UDP, TCP, DHCP, DNS, NTP, SMTP, POP3, MIME, HTTP, FTP and TELNET
- Security protocols: SSL3/TLS1, HTTPS, FTPS, RSA, AES-128/256, 3DES, RC-4, SHA-1, MD-5, MD-2
- Protocols accelerated in hardware: AES, 3DES and SHA

## *Application Program Interface:*

- AT+i protocol for Internet Controller mode
- SerialNET mode for transparent serial data-to-Internet bridging
- PPP operation mode for Modem-LAN conversion

## *Warranty:*

One year

## *Certifications:*

- FCC modular and CE pending

## *Installation Requirements:*

The Nano SocketLAN must be installed within a full-enclosure device that is safety certified.
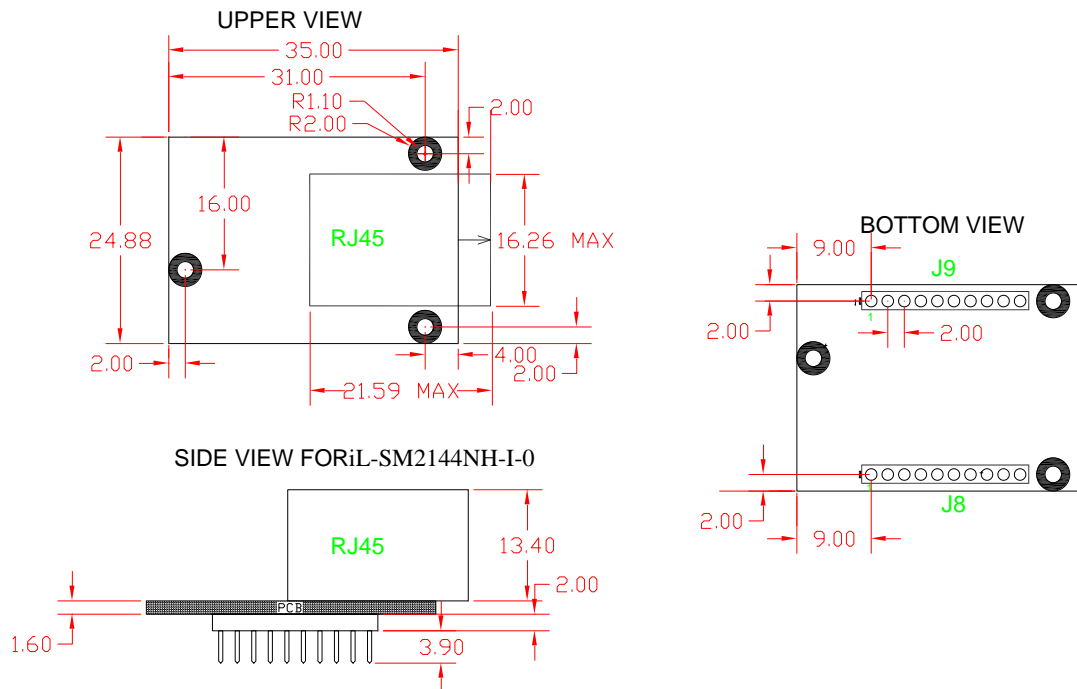
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# Connect One™

## Pin Assignments:

### J8 Pin Assignments

| # | Signal | type | Description |
|---|--------|------|-------------|
| 1 | GND | Power | |
| 2 | VDD | Power | |
| 3 | RXD0 | Input | UART 0 Receive |
| 4 | TXD0 | Output | UART 0 Transmit |
| 5 | nCTS0 | Input | UART 0 Clear To Send |
| 6 | nRTS0 | Output | UART 0 Request To Send |
| 7 | DATA_RDY | Output | Data Ready. Indicates new data is waiting to be read. Correlates to status report AT+iRP7. May be left unconnected. |
| 8 | MSEL | Input | Mode Select. Enables Rescue Mode. Enables re-programming firmware. May be left unconnected. |
| 9 | nRESET | Input | Reset Module.(at least 10mSec) |
| 10 | ACT Led | Output | ACT Led Indicator |

### J9 Pin Assignments

| # | Signal | type | Description |
|---|--------|------|-------------|
| 11 | nSPI1_CS | Input | SPI1 host chip select |
| 12 | SPI1_CLK | Input | SPI1 clock |
| 13 | SPI1_MISO | Output | SPI1 slave out |
| 14 | SPI1_MOSI | Input | SPI 1 Slave in |
| 15 | SPI1_INT | Output | SPI 1 data in buffer |
| 16 | Readiness | Output | iChip Ready. Indicates that the boot sequence completed. May be left unconnected. |
| 17 | DDM | Analog | USB Device Negative |
| 18 | DDP | Analog | USB Device Positive |
| 19 | SPEED Led | Output | SPEED Led Indicator |
| 20 | GND | Power | |

## Mechanical View:

All measurements are in millimeters:



UPPER VIEW



BOTTOM VIEW

SIDE VIEW FORiL-SM2144NH-I-0

| Ordering Information | |
| --- | --- |
| **Part Number** | **Description** |
| iL-SM2144NH-I | Nano SocketLAN module |
| | |
| II-EVB-363MS-110 | Evaluation board for Nano SocketLAN. Includes Nano SocketLAN attached to a motherboard's 2x10pin header connector. The main board includes one male-female RS-232 DB-9 connector for high speed USART, RJ-45, USB, SPI and DC power connector. 110v power supply. RoHS. |
| II-EVB-363MS-220 | Evaluation board for Nano SocketLAN. Includes Nano SocketLAN attached to a motherboard's 2x10pin header connector. The main board includes one male-female RS-232 DB-9 connector for high speed USART, RJ-45, USB, SPI and DC power connector. 220v power supply. RoHS. |

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