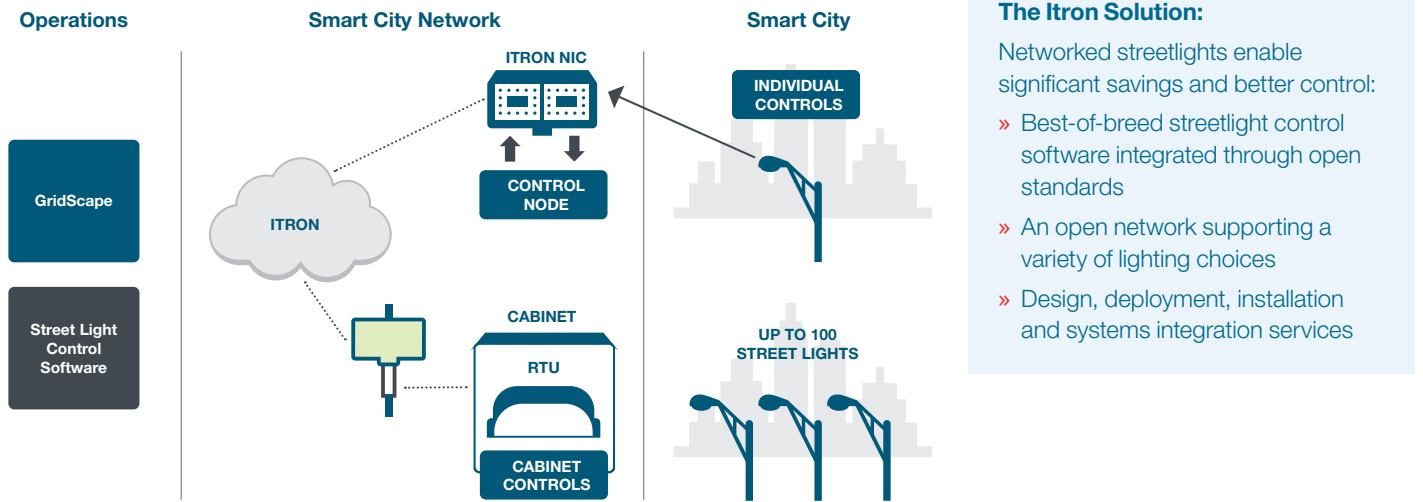# Streetlight NIC

Data Sheet

The Itron Streetlight NIC (NIC 450 series) is designed to be integrated into uses a network interface card (NIC) designed to fit inside existing products as a retrofit to provide communication and control for streetlights. The Streetlight NIC is designed to be integrated into control nodes, photocells, and streetlight controllers, and it provides advanced functionality for controlling external devices such as dimmable electronic ballasts and LED fixtures. The NIC uses industry standard interfaces (such as 1-10V or DALI) to control these devices. An optional GPS chip can be added to provide accurate location and time. Alternatively, a real-time clock (RTC) can be provided with backup battery/super caps to keep time, even when the NIC has lost power.

The NIC easily installs inside streetlight devices and leverages other Itron devices to form a high-resilience mesh network for the city and utility. The resulting two-way communications network gives cities and utilities greater efficiency, more reliable service delivery, improved customer satisfaction, and a scalable platform for adding advanced smart grid applications–both now and in the future.

KEY BENEFITS

Itron solutions combine network infrastructure, software, and professional services to enable a range of smart grid applications. Enabling two-way communications with next generation streetlights is one of the fundamental building blocks for smart city infrastructure.

LED and Smart Street Lighting—the most value from a Street Light upgrade

The Itron Solution:

Networked streetlights enable significant savings and better control:

» Best-of-breed streetlight control software integrated through open standards

» An open network supporting a variety of lighting choices

» Design, deployment, installation and systems integration services

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Relying on older, less energy efficient lamp technology, street lighting can consume as much as 40% of a city's overall energy budget. By combining more efficient LED lighting and networking, today's smart street lighting yields significant energy and operational savings.

While migrating to LEDs cuts energy costs, networking the lights boosts your operational savings. Itron's Smart Street Lighting solutions enable you to:

» Reduce energy costs by migrating to networked LEDs, delivering 65% energy savings

» Increase operational savings to 40% from smart dimming and reduced run times.

» Maximize ROI with support for future smart city applications by leveraging our powerful and proven standards-based network infrastructure to support multiple smart grid and smart city applications.

» Improve public safety and mitigate liability risk with reliable smart street lighting and advanced controls to lower public safety incidents due to failed streetlights, and to help reduce crime up to 10%

PRODUCT FEATURES

High-performance Based Networking Technology with Gear Shifting

Supports up to 300 kbps raw data speeds. Provides link-by-link gear shifting for backward compatibility and dynamic optimization between range and performance.

Flexible, Cost-effective Neighborhood Area Network (NAN) Communications

Up to one-watt (1W) transmitter supports two-way NAN communications, including remote management and firmware upgrades.

System-on-Chip (SOC) Security

Accelerates security key set up and verifies secure boot loader supporting authentication and encryption.

Advanced Watchdog

Enables full power cycle of the device, which reduces the need for truck rolls.

Real Time Clock

NIC integrated with a real-time clock and super capacitors to provide backup time for up to 36 hours and across multiple power outages when no power is otherwise available and time cannot be obtained from the network.

Lamp Failure Detection and Burn Time

Monitors the current when lamp is turned on and sends an alert to the central management software (CMS) if a lamp that is turned on has no current running through it. Keeps a running counter of how long the lamp has had current flowing to it, a value used to detect remaining lamp life and predict maintenance needs.

On-demand Lamp On / Off / Dimming

Ability to override the current schedule and switch the lamp on/off/dim on-demand. Currently, the NIC supports 1-10V analog output for light dimming.

NIC 451 SPECIFICATIONS

Key Features and Operating Parameters

900 MHz NAN Transceiver	
Frequency Range (MHz)	902–928
Data Rate	Up to 300 kbps
Spreading Technique	Frequency Agile
Transmitter Output	1W
Emission Designator	250KF1D
Receiver Sensitivity	-98 dBm for 10% PER
NAN Network	
Addressing	8-byte MAC Address
Protocol	UDP / Ipv6
Image Security	Secure Bootloader
Confidentiality	AES-256 Encryption
Authentication	ECDSA & RSA Signatures

Processing	
Processor	ARM 7
RAM	8 MB
FLASH	16 MB
GPS	
NMEA Messaging	Acquisition Sensitivity -130dBm
Power Consumption	140mW
VCC/VCC_IO	1.8V/1.8V
Physical	
Size	Round 70mm in diameter
Height	11mm without on-board antenna 21mm with on-board antenna
Weight	43 grams
Environmental	
Temperature, Operating	-40°C to +85°C[1]
Humidity	95%, non-condensing

NIC 452 SPECIFICATIONS

Key Features and Operating Parameters

900 MHz NAN Transceiver	
Frequency Range (MHz)	915–928
Data Rate	Up to 300 kbps
Spreading Technique	Frequency Agile
Transmitter Output	1W
Emission Designator	250KF1D
Receiver Sensitivity	-98 dBm for 10% PER
NAN Network	
Addressing	8-byte MAC Address
Protocol	UDP / Ipv6
Image Security	Secure Bootloader
Confidentiality	AES-256 Encryption
Authentication	ECDSA & RSA Signatures

Processing	
Processor	ARM 7
RAM	8 MB
FLASH	16 MB
GPS	
NMEA Messaging	Acquisition Sensitivity -130dBm
Power Consumption	140mW
VCC/VCC_IO	1.8V/1.8V
Physical	
Size	Round 70mm in diameter
Height	11mm without on-board antenna 21mm with on-board antenna
Weight	43 grams
Environmental	
Temperature, Operating	-40°C to +85°C[1]
Humidity	95%, non-condensing

[1]The operating temperature is the ambient temperature at the NIC.
Note: Output frequencies and power levels are marketspecific. Contact your Itron representative for additional information.

NIC 453 SPECIFICATIONS

Key Features and Operating Parameters

900 MHz NAN Transceiver	
Frequency Range (MHz)	865-870, 870-875.6
Data Rate	Up to 100 kbps
Spreading Technique	Frequency Agile
Transmitter Output	Up to 500mW erp
Emission Designator	109KF1D (EU873, EU876) 51KF1D (EU868) 98KF1D (FRA)
Receiver Sensitivity	-98 dBm for 10% PER
NAN Network	
Addressing	8-byte MAC Address
Protocol	UDP / Ipv6
Image Security	Secure Bootloader
Confidentiality	AES-256 Encryption
Authentication	ECDSA & RSA Signatures

Processing	
Processor	ARM 7
RAM	8 MB
FLASH	16 MB
GPS	
NMEA Messaging	Acquisition Sensitivity -130dBm
Power Consumption	140mW
VCC/VCC_IO	1.8V/1.8V
Physical	
Size	Round 70mm in diameter
Height	11mm without on-board antenna 21mm with on-board antenna
Weight	43 grams
Environmental	
Temperature, Operating	-40°C to +85°C[1]
Humidity	95%, non-condensing

NIC 454 SPECIFICATIONS

Key Features and Operating Parameters

900 MHz NAN Transceiver	
Frequency Range (MHz)	865-867
Data Rate	100 kbps
Spreading Technique	Frequency Agile
Transmitter Output	1W
Emission Designator	109KF1D
Receiver Sensitivity	-98 dBm for 10% PER
NAN Network	
Addressing	8-byte MAC Address
Protocol	UDP / Ipv6
Image Security	Secure Bootloader
Confidentiality	AES-256 Encryption
Authentication	ECDSA & RSA Signatures

Processing	
Processor	ARM 7
RAM	8 MB
FLASH	16 MB
GPS	
NMEA Messaging	Acquisition Sensitivity -130dBm
Power Consumption	140mW
VCC/VCC_IO	1.8V/1.8V
Physical	
Size	Round 70mm in diameter
Height	11mm without on-board antenna 21mm with on-board antenna
Weight	43 grams
Environmental	
Temperature, Operating	-40°C to +85°C[1]
Humidity	95%, non-condensing

[1]The operating temperature is the ambient temperature at the NIC.
Note: Output frequencies and power levels are market-specific. Contact your Itron representative for additional information.

APPROVALS

Country	Specification
United States	FCC Part 15.247
Canada	RSS-247
Mexico	IFT-008 permanent certificate
Europe	EU compliance » ETSI EN 302208-2 » ETSI EN 303204-2 » ETSI EN 300 220 » ETSI EN 301489-1/3 » EN 62311 » EN 60950-1
Australia/ New Zealand	AUS/NZL compliance » AS/NZS 4268 » ARPANSA » AS/NZS CISPR 22
Brazil	ANATEL Resolution No.506
India	Notification No.R-11014/23/2004-LR
RoHS	Restriction of Hazardous Substances
WEEE	Waste Electrical & Electronic Equipment (recycling)

ORDERING INFORMATION

	NIC Cat. #	NIC Model Number	Region	Spectrum (MHz)	Int. Ant	Ext. Ant	8 MB Memory	Data Rate (kbps)	Real-time clock with super cap	GPS + Int. Ant
Basic	380-001200	451-0101	North America	902-928 Mesh	Yes	-	Yes	300	-	-
	380-002200	452-0101	Oceania	915-928 Mesh	Yes	-	Yes	300	-	-
	380-002204	452-0101	Oceania	915-928 Mesh	Yes	-	Yes	300	-	-
	380-002250	452-0101	China	915-928 Mesh	Yes	-	Yes	300	-	-
	380-002265	452-0101	Hong Kong	915-928 Mesh	Yes	-	Yes	300	-	-
	380-003211	453-0101	Europe	870-873 Mesh	Yes	-	Yes	100	-	-
	380-003220	453-0101	Europe	865-870 Mesh	Yes	-	Yes	50	-	-
	380-003225	453-0101	Europe	870-875.6 Mesh	Yes	-	Yes	100	-	-
	380-004260	454-0101	India	865-867 Mesh	Yes	-	Yes	100	-	-
Standard + (W/GPS)	380-001201	451-0121-05	North America	902-928 Mesh	Yes	-	Yes	300	-	Yes
	380-002201	452-0121-05	Oceania	915-928 Mesh	Yes	-	Yes	300	-	Yes
	380-002208	452-0121-05	Oceania	915-928 Mesh	Yes	-	Yes	300	-	Yes
	380-003212	453-0121-05	Europe	870-873 Mesh	Yes	-	Yes	100	-	Yes
	380-003221	453-0121-05	Europe	865-870 Mesh	Yes	-	Yes	50	-	Yes
	380-003226	453-0121-05	Europe	870-875.6 Mesh	Yes	-	Yes	100	-	Yes
	380-004261	454-0121-05	India	865-867 Mesh	Yes	-	Yes	100	-	Yes
Advance (Control Node)	380-001220	451-0102-03	North America	902-928 Mesh	-	Yes	Yes	300	Yes	-
	380-003213	453-0102-03	Europe	870-873 Mesh	-	Yes	Yes	100	Yes	-
	380-003222	453-0102-03	Europe	865-870 Mesh	-	Yes	Yes	50	Yes	-
	380-003227	453-0102-03	Europe	870-875.6 Mesh	-	Yes	Yes	100	Yes	-
	380-004262	454-0102-03	India	865-867 Mesh	-	Yes	Yes	100	Yes	-

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CORPORATE HQ

2111 North Molter Road
Liberty Lake, WA 99019 USA

Phone: 1.800.635.5461
Fax: 1.509.891.3355