Data Sheet

TONN-9

Trend Open Network Node

TONN-9 Trend Open Network Node

Description

The TONN9 is a Trend network device that enables a Trend system to interface with a wide range of 3rd party systems.

TONN9 utilises the powerful Niagara 4 Framework® to enable the integration of Heating, Ventilation, Air Conditioning (HVAC) systems and non-HVAC systems (e.g. lighting and security) running on a diverse range of networks and protocols, including BACnet®, LonWorks®, M-Bus, Modbus®, and KNX.

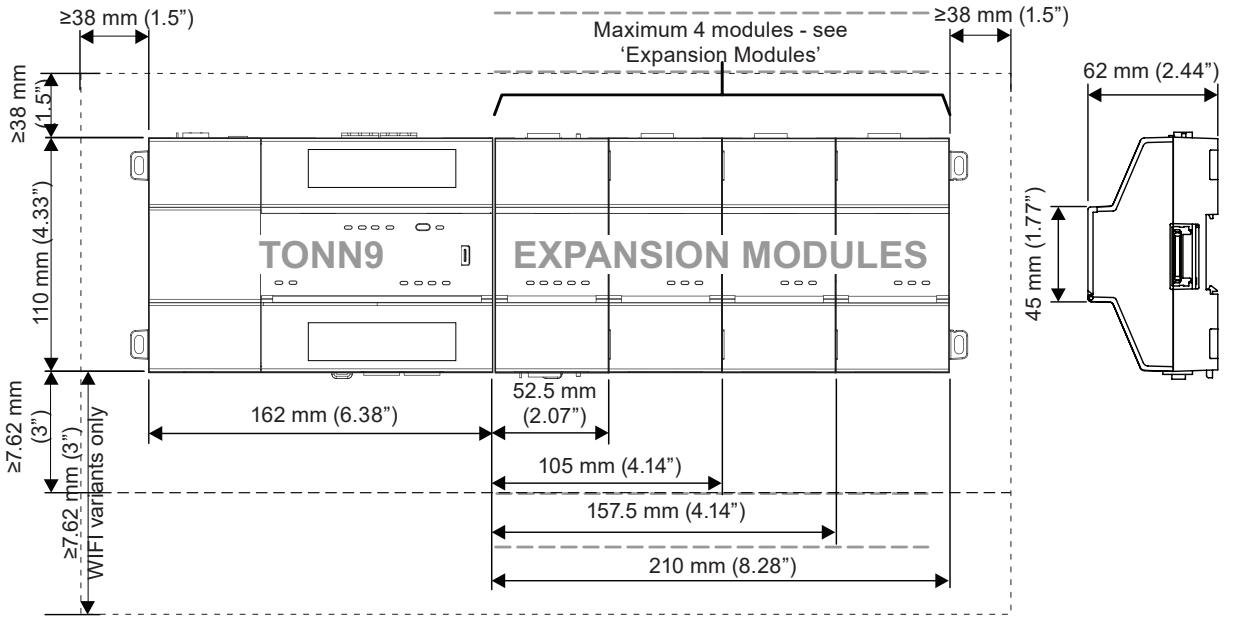
It can be configured to provide bidirectional reading and/or writing of data between a Trend system and 3rd party systems, as well as allowing 3rd party systems to access Trend logged data, receive Trend alarms and adjust Trend time schedules.

Features

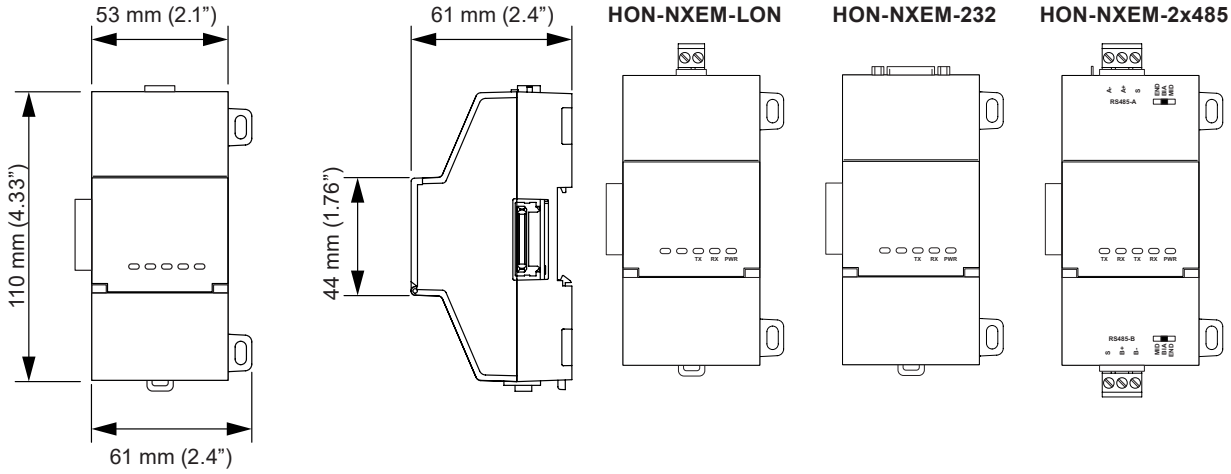
- Bidirectional reading and/or writing of data between a Trend system and 3rd party systems.
- Allows 3rd party systems to access Trend logged data, receive Trend alarms and adjust Trend time schedules.
- Comprehensive set of 3rd party drivers included as standard with additional optional drivers available.
- 2 onboard 10/100/1000 MB Ethernet ports.
- 2 isolated RS-485 with selectable bias and termination.
- Expansion modules available up to 4 modules.
- WiFi option for wireless access point or client operation.
- Secure boot
- DIN rail or surface mounting.
- 24 Vac/dc Standard Global power supply.

Physical

TONN9



Expansion Modules

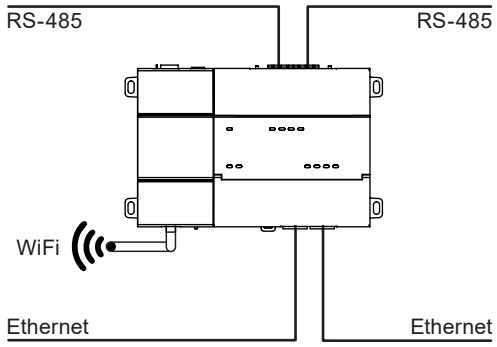


FUNCTIONALITY

TONN9 is a Trend network device that enables the Trend system to interface with 3rd party systems.

SYSTEM

The TONN9 has communications ports for Ethernet, RS485, and WiFi:



Note: Extra RS-485, RS-232 and LON FTT ports can be added by installing expansion modules - see 'Expansion Modules'.

Ethernet: TONN9 has two Ethernet ports. The primary port is used for configuration and for connecting to the Trend network. The secondary port can be configured for communications with 3rd party systems. No IP routing or bridging is provided between the two ports and they must be connected to different subnets.

RS-485: TONN9 has two RS-485 ports which can be used for communications with 3rd party systems.

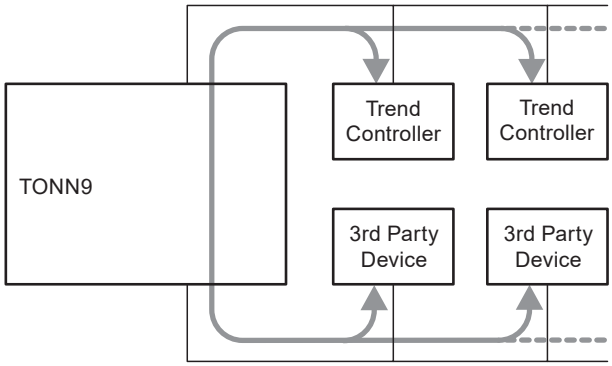
WiFi: (TONN9 WiFi variants only): The WiFi interface can be configured to operate in either Client or Access Point modes.

In Client mode TONN9 can connect to an existing IEEE 802.11 WiFi access point and its associated network.

In Access Point mode TONN9 operates as a wireless access point for WiFi-enabled field bus devices, or to provide browser or IQVISION access to local configuration tools.

System Integration

TONN9 is supplied with the Trend N4 driver enabling it to interface with the Trend system over Ethernet. Additional drivers are provided allowing it to interface with a wide range of 3rd party systems.



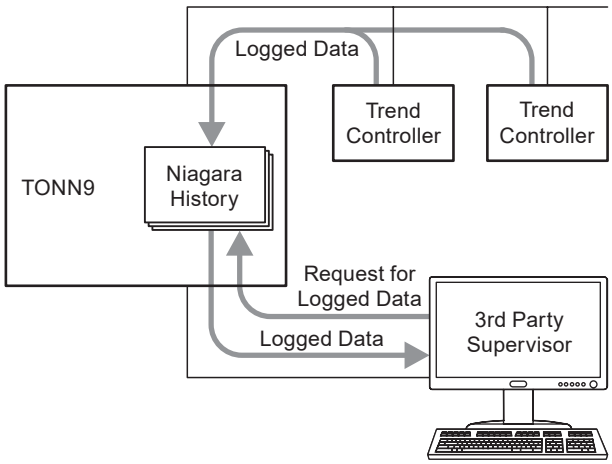
TONN9 Connection to Trend Network
TONN9 connects to the Trend network over Ethernet using a virtual CNC (vCNC) in another Trend device.

Read/Write Values: TONN9 enables bidirectional reading and/or writing of data between a Trend system and 3rd party systems. The points (values) to be read or written from each system are added to the TONN9 database and then linked together as required. If needed, values can be adjusted or manipulated mathematically (e.g. to obtain an average of several values).

IQVISION
IQVISION can directly access values, histories and Niagara schedules from a TONN9 and make adjustments, providing it is connected to the same IP network and has the appropriate licence.

3rd Party Supervisors

Access logged data: Data logged by Trend controllers can be accessed by a 3rd party supervisor via the TONN9. The TONN9 must be configured to archive the required logged data from the controller and make it available as a Niagara history. The 3rd party supervisor then requests the Niagara history from the TONN9.



In the diagram above the TONN9 has been configured to archive the logged data from the Trend controller(s). This data is regularly archived by the TONN9 and stored in a Niagara history. When the logged data is required by the 3rd party supervisor, it requests the data from the appropriate Niagara history in the TONN9. The data is then passed from the TONN9 to the supervisor where it can be processed as required, e.g. to display a graph of the data.

Receive alarms from the Trend system: Alarms from the Trend system can be received and acknowledged from a 3rd party supervisor through the TONN9's Niagara framework.

The controller is configured to either send the alarms to the vCNC that TONN9 is connected to, or to the TONN9's IP address and port number used by its alarm listening service. The TONN9 must have its alarm service configured with a console recipient. This places the alarms in the TONN9's Niagara framework. The TONN9 and supervisor must then be configured accordingly.

Adjust Time Schedules in the Trend system: Time Schedules in a Trend controller in the Trend system can be adjusted by a 3rd party supervisor through the TONN9's Niagara framework. To do this Niagara schedules in the TONN9 must be linked to Time Schedule modules in the Trend controller. When the supervisor adjusts the Niagara schedule, the changes are sent to the linked Time Schedule module in the Trend controller.

Connection to 3rd Party Systems

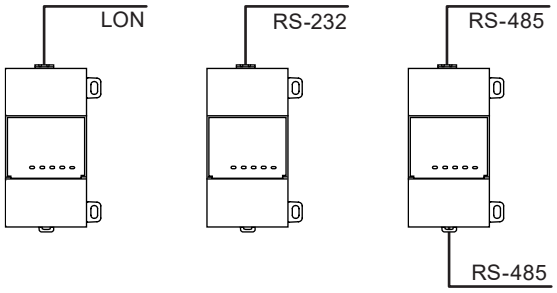
TONN9 physically connects to the 3rd party systems with any of its available communications ports (either onboard or via optional expansion modules). The Niagara drivers enable communications with the 3rd party systems - see 'Drivers' on page 4.

Expansion Modules

Optional expansion modules can be connected to TONN9 to provide additional communications ports.

There are three different expansion modules which must be purchased separately:

HON-NXEM-LON:	Single LON port
HON-NXEM-232:	Single RS-232 port
HON-NXEM-2x485:	Two RS-485 ports

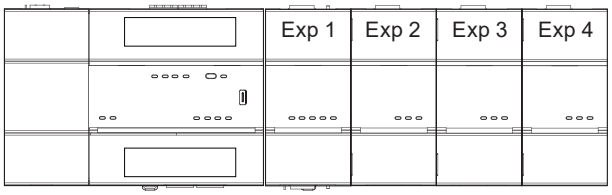


TONN9 supports up to four expansion modules and they may be installed in any combination up to the maximum permitted number for each module type:

Module	Max Number
HON-NXEM-LON	4
HON-NXEM-232	4
HON-NXEM-2x485	2*

*If you are using the maximum of two RS-485 modules, only one additional non-RS-485 module (e.g. LON or RS-232) may be used.

Module Combinations



Expansion 1	Expansion 2	Expansion 3	Expansion 4
232 or LON	232 or LON	232 or LON	232 or LON
485 485	232 or LON	232 or LON	232 or LON
485 485	485 485	232 or LON	
485 485	485 485		

Licensing

TONN9 is licensed based on the number of points to be monitored and includes an 18 month software update agreement.

Upgrade options are available to increase the point count and to extend the period covered by the software update agreement. See 'Order Codes' on page 8 for further details.

Configuration

TONN9 is configured using IQVISION. For full details on how to configure TONN9 please refer to the TONN9 Configuration Manual (TE201520).

Operating System

TONN9 ships with the Niagara 4 platform. During the commissioning process TONN9 will adopt the same version of Niagara as used by IQVISION.

DRIVERS

Standard Drivers

TONN9 is supplied with the Trend N4 driver plus:

- BACnet® IP Client over Ethernet.
- BACnet® MS/TP Client over RS-232 or RS-485.
- EIB/KNX IP Driver designed to connect to an EIB/KNX network via an IP to EIB interface.
- LON® over IP, using CEA-852, communicates through IP/LON® router.
- LON® over twisted pair.
- M-Bus network via an RS-232 to M-Bus interface.
- RTU MODBUS® RTU over RS-232 or RS-485.
- TCP MODBUS® TCP over Ethernet.
- SNMP over Ethernet.
- BACnet® IP Server (includes BACnet® IP Client Driver.
- BACnet® Server only.
- MODBUS® Driver that serves TONN8 data to other MODBUS® Master devices over RS-485.
- OPC UA
- MODBUS® TCP Slave Driver that 'serves' TONN8 data to other MODBUS® Master devices over a MODBUS® TCP connection.

Additional Drivers

The following additional drivers can be purchased in addition to those supplied as standard:

Fidelio Driver: Enables TONN9 to communicate over an IP network to a Micros Fidelio hotel room booking system.

JSON Driver: Provides support for JSON messages within TONN9.

SMS Driver: Enables TONN9 to end SMS messages.

Note: The SMS hardware is not supplied and requires the HON-NXEM-232 module.

Note: TONN9 can also be used with other third party drivers available for the Niagara 4 platform.

BACnet Certification

TONN9 will adopt the BACnet certification status of the installed version of Niagara. For details, please refer to the IQVISION Data Sheet (TA201381).

Cloud Connectivity

TONN9 supports connectivity with the Honeywell Forge Cloud solution.

MODULE PROPERTY VIEWER

The module property viewer allows all properties (e.g. High Alarm and Low alarm thresholds) from discovered Trend modules can be viewed and adjusted using virtual points. Virtual points do not add to the licensable point count.

ANALYTICS

TONN9 Supports Niagara analytics - see the Analytics Data Sheet - TA201430.

E-SIGNATURE

TONN9 Supports Niagara e-signature - see the E-signature Data Sheet - TA201432.

HEALTHY BUILDING DASHBOARD

TONN9 integrates with the Honeywell Healthy Building Dashboard to provide an overview of the performance, comfort level and environment safety of the building environment. For more details see the Healthy Buildings Dashboard Data Sheet (TA201468).

Note: TONN9 supports a maximum of 5 zones.

IQENERGY

IQENERGY is a versatile software tool that enables energy usage data from the Trend Building Energy Management System (BEMS) to be collected and presented using a range of visualisation and reporting methods.

By gathering and processing data from energy meters, utility meters and sensors, IQENERGY is able to monitor building performance and analyse energy usage within a building or estate, enabling facility managers to make informed decisions to optimise energy efficiency.

For more details see the IQENERGY Data Sheet (TA201424).

HARDWARE - TONN9

Enclosure

The TONN9 is housed in a plastic case compatible with DIN43880 enclosures. It is suitable for mounting in a panel or EN50022 standard 1.37" (35 mm) DIN rail.

Communications Ports

Ethernet
TONN9 has two 10/100/1000 Mbit Ethernet ports identified as PRI (LAN 1 primary) and SEC (LAN2). No routing or bridging is provided between the two ports and, where both are used, they must be connected to different subnets. Normally, only LAN 1 (primary port) is used, for configuration and connection to a Trend system. LAN 2 (secondary port) may be used for connection to a 3rd party system; it must not be used as the primary port.

Note: TONN9 is not compatible with a Power-Over-Ethernet network.

Serial RS-485
TONN9 has two RS-485 ports. Each is capable of operation up to 115,200 baud.

RS-485 Bias/Termination: Each RS-485 port has a 3-position switch that allows the connections to be biased and/or terminated. Biasing helps to provide reliable communications.

Switch Position	Bias Resistors	Termination	Use when TONN9...
BIA	2.7KΩ	None	... is located in the middle of a trunk that is not biased elsewhere.
END	562 Ω	150 Ω	... is located at the end of a trunk that is not biased elsewhere.
MID	47.5KΩ	None	... is located in the middle of a trunk that is already biased.

Note: LON and RS-232 ports and additional RS-485 ports can be added by connecting expansion modules - see "Expansion Modules' on page 2). For module hardware see page 5.

USB
The USB port can be used for debugging. It cannot be connected to Trend/3rd party systems.

WiFi Interface (WiFi variants only)
An integral WiFi adapter provides wireless connectivity using the IEEE 802.11a/b/g/n/ac standard, and provides an RP-SMA antenna connector. A tilt-and-swivel 2.4GHz antenna is provided as standard. A 3-position switch sets the WiFi mode:

- OFF - WiFi interface is disabled (default condition).
- ACC - Operates as a WiFi access point for up to 20 clients.
- CLT - Operates as a client to an existing 802.11a/b/g/n router or access point.

Input Power Supply

The TONN9 requires a 24 Vac rated at 24 VA minimum, or 24Vdc rated at 1 Amp (24 W) minimum. The supply must include a suitably rated switch in close proximity and be clearly marked as the disconnecting device for the unit.

Power Failure Protection & Data Backup

System critical data is saved to the memory card. In the event of a power outage any unsaved data is held in SRAM which is maintained by a super capacitor for up to two weeks.

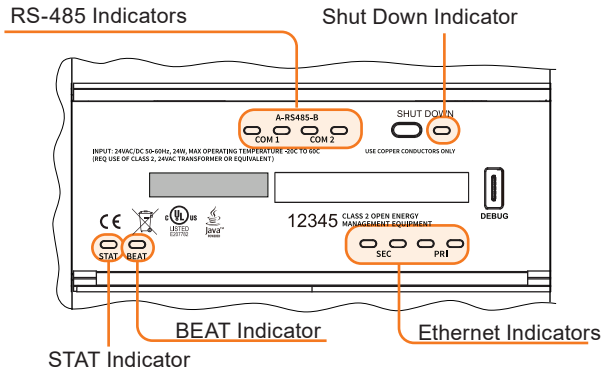
The TONN9 configuration can also be backed up to a USB storage device.

Memory Card

The memory card is used to store backups. Backups, once generated, are encrypted with a system passphrase that is stored in the TONN9. You must reenter this same passphrase to restore a backup from the memory card, using a serial connection to the Debug port.

Indicators

TONN9 provides a number of status LEDs and a heartbeat LED. All but one is visible with the front access door closed.



RS-485 Indicators
RS-485-A (COM1) and RS-485-B (COM2) each have two indicators:

Indicator	Function
Green (RX) RX	Indicates the TONN9 is receiving data on the RS-485 port.
Yellow (TX) TX	Indicates the TONN9 is transmitting the RS-485 port.

Note: These indicators use a fixed on time when a message is detected. If an indicator is ON constantly this can indicates a wiring problem,

STAT Indicator
The green STAT LED provides a CPU machine status check and should remain lit whenever TONN9 is powered, OFF indicates a fault.

BEAT Indicator
In normal operation, the BEAT LED blinks at 1 Hz, with a 50% / 50% on/off duty cycle.

After power is applied, during bootup, the it flashes at a 1 Hz rate, at 50% / 50% on/off duty cycle. The bootup process status is indicated by blink patterns as described in the table below.

Pattern	Function
0.2 second on / 0.2 second off	System, is up, Niagara is starting and no station is running.
0.2 second on / 1 second off	System, is up, Niagara is running and no station is running.
1 second on / 1 second off	System, is up, Niagara is running and a station is running.

If the BEAT LED stays on constantly, does not light, or blinks very fast, a fault may be present.

Ethernet Indicators
Primary Ethernet port (PRI primary LAN1) and Secondary Ethernet port (SEC LAN2) each have two indicators:

Indicator	Function
Green (left side) Link	ON - Ethernet link is made. OFF - No Ethernet link is made.
yellow (right-side) Activity	ON / Blinking - indicates data TX or RX. OFF - No Ethernet activity.

Shut Down Indicator
Indicates that a shut down job is in progress.

HARDWARE - EXPANSION MODULES

Enclosure

Each expansion module is housed in a plastic enclosure with a complimentary styling to the TONN9. A connector on the left side of the module plugs into the right side of the TONN9 or another module.

An integral clip on the back of the case enable the unit to be clipped on to (and quickly released from) a standard TS35 DIN rail. Two fixing lugs also allow surface mounting if required.

Input Power Supply

The expansion modules are powered from the TONN9 via the side connector.

LON Expansion Module

LON Port: Provides TONN9 with an additional single FTT-10A LONWORKS® port. A 2-way removable screw-terminal connector plug is provided enabling it to connect to a LONWORKS network.

Indicators: There are three indicators on the front of the module:

Indicator	Function
TX	Blinking indicates that TONN9 is transmitting a message on the LONWORKS network.
RX	Blinking indicates that another LONWORKS device is transmitting a message on the LONWORKS network.
PWR	ON - module is powered.

RS-232 Expansion Module

RS-232 Port: Provides TONN9 with an additional single RS-232 port. The port is electrically isolated. A DB9 male connector is provided enabling easy connection. An onboard UART supports baud rates of up to 115200.

Indicators: There are three indicators on the front of the module:

Indicator	Function
TX	Blinking indicates that TONN9 is sending data to a device on the RS-232 port.
RX	Blinking indicates that TONN9 is receiving data from a device on the RS-232 port.
PWR	ON - module is powered

RS-485 Expansion Module

RS-485 Ports: Provides TONN9 with two additional RS-485 ports. Each port is electrically isolated. A 3 way removable screw-terminal connector plug is provided for each port.

RS-485 Bias/Termination: Each RS-485 port has a 3-position switch that allows the connections to be biased and/or terminated. Biasing ties the data lines to the power rail using resistors and helps to provide reliable communications.

Switch Position	Bias Resistors	Termination	Use when the module...
BIA	2.7KΩ	None	... is located in the middle of a trunk that is not biased elsewhere.
END	562 Ω	150 Ω	... is located at the end of a trunk that is not biased elsewhere.
MID	47.5KΩ	None	... is located in the middle of a trunk that is already biased.

Indicators: There are five indicators on the front of the module:

Indicator	Function
TX	There are two TX indicators: one for each port. Blinking indicates that TONN9 is sending a message to a device on the RS-485 trunk.
RX	There are two RX indicators one for each port. Blinking indicates that TONN9 is receiving data from a device on the RS-485 trunk.
PWR	ON - Module is powered

FIELD MAINTENANCE

The TONN9 requires no routine maintenance.

Warning: Contains no serviceable parts. Opening the unit exposes hazardous voltages.

DISPOSAL

COSHH (Control of Substances Hazardous to Health - UK Government Regulations 2002) ASSESSMENT FOR DISPOSAL OF TONN9.

RECYCLING ♻.
All plastic and metal parts are recyclable. The printed circuit board may be sent to any PCB recovery contractor to recover some of the components for any metals such as gold and silver.

WEEE Directive:

At the end of their useful life the packaging, product, and battery (if fitted) should be disposed of by a suitable recycling centre.
Do not dispose of with normal household waste.
Do not burn.

COMPATIBILITY

TREND SYSTEM

Trend network: TONN9 provides connectivity to a Trend network via any Ethernet-enabled device with an available virtual CNC (vCNC) including vCNC in secure mode. TONN9 is not compatible with TMN connections to remote sites.

Controllers: Trend IQ controllers and IQX controllers. IQ4 v3.70 or greater or IQ5 controllers required for secure vCNC connection.

Trend Supervisors: IQVISION v4.15u2 or greater.

3RD PARTY SYSTEMS

3rd Party Systems: TONN9 is supplied with drivers for several 3rd party systems. Additional drivers can also be purchased - see ‘Drivers’ on page 4 for details.

EXPANSION MODULES

Expansion Modules: HON-NXEM-LON, HON-NXEM-232, HON-NXEM-2x485.

NIAGARA COMPATIBILITY STATEMENT (NiCS)

Property	Value
STATION COMPATIBILITY IN	All
STATION COMPATIBILITY OUT	All
TOOL COMPATIBILITY IN	All
TOOL COMPATIBILITY OUT	All

INSTALLATION

TONN9 is designed to be clipped on to a standard DIN rail or surface mounted. The TONN9 must be installed inside a secondary enclosure with a minimum protective rating of IP20 (or equivalent) or mounted outside normal reach (e.g. in a plenum). The installation procedure involves:

Mount TONN9 in position
Mount expansion modules
Connect to power and earth/ground
Connect antenna (WiFi variants only)
Connect primary Ethernet network
Connect RS-485 to network(s) (if required)
Set RS-485 bias/termination (if required)
Connect RS232 (if using RS-232 module)
Connect LON (if using LON module)
Power up
Configure TONN9
Check correct operation

A full description of installing the unit is given in the TONN9 Installation Instructions - Mounting (TG201519). Configuration of TONN9 is described in the TONN9 Configuration Manual (TE201520).

ORDER CODES

For Niagara analytics order codes see the Analytics Data Sheet (TA201430). For Niagara e-signature order codes see the E-Signature Data Sheet (TA201432). For Healthy Building Dashboard order codes see the Healthy Building Dashboard Data Sheet (TA201468). For IQENERGY order codes see the IQENERGY Energy Manager Data Sheet (TA201424).

TONN9

TONN-9-24	TONN9 with 1 year software update agreement.
TONN-W02-9-24	TONN9 with WiFi module Zone 2, and 1 year software update agreement.
TONN-W05-9-24	TONN9 with WiFi module Zone 5, and 1 year software update agreement.
TONN-9100-24	TONN9 with 100 Proxy Points license and 1 year software update agreement.
TONN-9250-24	TONN9 with 250 Proxy Points license and 1 year software update agreement.
TONN-9500-24	TONN9 with 500 Proxy Points license and 1 year software update agreement.
TONN-91250-24	TONN9 with 1250 Proxy Points license and 1 year software update agreement.
TONN-95000-24	TONN9 with 5000 Proxy Points license and 1 year software update agreement.
TONN-910000-24	TONN9 with 10000 Proxy Points license and 1 year software update agreement.
TONN-W05-9100-24	TONN9 with WiFi module Zone 5, 100 Proxy Points license and 1 year software update agreement.
TONN-W05-9250-24	TONN9 with WiFi module Zone 5, 250 Proxy Points license and 1 year software update agreement.
TONN-W05-9500-24	TONN9 with WiFi module Zone 5, 500 Proxy Points license and 1 year software update agreement.
TONN-W05-91250-24	TONN9 with WiFi module Zone 5, 1250 Proxy Points license and 1 year software update agreement.
TONN-W05-95000-24	TONN9 with WiFi module Zone 5, 5000 Proxy Points license and 1 year software update agreement.
TONN-W05-910000-24	TONN9 with WiFi module Zone 5, 10000 Proxy Points license and 1 year software update agreement.

EXPANSION MODULES

HON-NXEM-LON	TONN9 LON Expansion Module - Single Port.
HON-NXEM-2x485	TONN9 RS-485 Expansion Module - Dual Port.
HON-NXEM-232	TONN9 RS-232 Expansion Module - Single Port.

UPGRADES

TONN-DEVICE-UP-10	TONN9 Upgrade for an addition 500 proxy points.
TONN-DEVICE-UP-25	TONN9 Upgrade for an addition 1250 proxy points.
TONN-DEVICE-UP-50	TONN9 Upgrade for an addition 2500 proxy points.
TONN-NA-100	TONN9 Niagara Analytics Framework for 100 analytic points
TONN-NA-250	TONN 9 Niagara Analytics Framework for 250 analytic points
TONN-NA-500	TONN 9 Niagara Analytics Framework for 500 analytic points
TONN-NA-1000	TONN 9 Niagara Analytics Framework for 1000 analytic points

ADDITIONAL DRIVERS

IQV-DR-S-JSON	JSON Driver for TONN9.
TONN-DR-MFID	Fidelio Driver for TONN9.
TONN-DR-SMS-ALM	SMS Driver for TONN9.
IQV-DR-HTTP N4	HTTP client driver for TONN9. Requires an active SMA.

SOFTWARE UPDATE AGREEMENTS

TONN9 ships with an 18 month free software update agreement. An additional period of cover can be purchased:

TONN-SMA-9005-1YR	1 year software update agreement for a 100-499 point TONN9.
TONN-SMA-9005-3YR	3 year software update agreement for a 100-499 point TONN9.
TONN-SMA-9005-5YR	5 year software update agreement for a 100-499 point TONN9.
TONN-SMA-9010-1YR	1 year software update agreement for a 500-1249 point TONN9.
TONN-SMA-9010-3YR	3 year software update agreement for a 500-1249 point TONN9.
TONN-SMA-9010-5YR	5 year software update agreement for a 500-1249 point TONN9.
TONN-SMA-9025-1YR	1 year software update agreement for a 1250-4999 point TONN9.
TONN-SMA-9025-3YR	3 year software update agreement for a 1250-4999 point TONN9.
TONN-SMA-9025-5YR	5 year software update agreement for a 1250-4999 point TONN9.
TONN-SMA-9100-1YR	1 year software update agreement for a 5000-9999 point TONN9.
TONN-SMA-9100-3YR	3 year software update agreement for a 5000-9999 point TONN9.
TONN-SMA-9100-5YR	5 year software update agreement for a 5000-9999 point TONN9.
TONN-SMA-9200-1YR	1 year software update agreement for a 10000+ point TONN9.
TONN-SMA-9200-3YR	3 year software update agreement for a 10000+ point TONN9.
TONN-SMA-9200-5YR	5 year software update agreement for a 10000+ point TONN9.

ACCESSORIES

TONN-9-24	TONN9 Hardware only no WiFi - for warranty/repair only. License must be transferred from existing host.
TONN-W05-9-24	TONN9 Hardware only with WiFi module for zone 5 - for Warranty/Repair only. License must be transferred from existing host.
TONN-9-CLIP	Trend branded clip for TONN9.
TONN-9-SD	SD Card for TONN9.

SPECIFICATIONS

TONN9

Electrical

CPU	NXP iMX8M+ Quad Core CPU
Memory capacity	2 GB LPDDR4 RAM 8GB onboard EMMC storage
Memory Removable	8 GB microSD card
Supply Input	24 VAC rated @ 24 VA minimum 24VDC rated @ 1 Amp (24 W) minimum.
Timekeeping	Real-time clock
Battery type	Batteryless

Ethernet

Number of Ports	2 10/100/1000 MB
Transmission	10/100/1000

RS485

Ports	2 isolated RS-485 with selectable bias and termination.

USB (Debug Port)

Number of Ports	1

WiFi (Wifi variants only)

Client or WAP	
Network	WiFi 5 (802.11ac) IEEE802.11 a/b/g/n/ac
Modes	Configurable radio (Off, WAP, or Client)
Security Protocol	WPAPSK/WPA2PSK
Frequency	2.4 GHz channels: 1–11; 5.8 GHz channels: 36, 40, 44, 48,149, 153, 157, 161, and 165.

Indicators

RS-485 A (COM1)	
TX	Yellow LED.
RX	Green LED.
RS-485 B (COM2)	
TX	Yellow LED.
RX	Green LED.
BEAT	Yellow LED.
STAT	Green LED.
PRI (Primary Ethernet, LAN1)	
Link	Green LED.
Activity	Yellow LED.
SEC (Secondary Ethernet, LAN2)	
Link	Green LED.
Activity	Yellow LED.
Shut Down	
Link	Green LED.

Environmental

Ambient Limits	
Storage	-40°C to +85°C (-40°F to 185 °F).
Operating	-20°C to +60°C (-4 °F to 140 °F).
Humidity	5 to 95 %RH non-condensing.
Shipping & vibration	ASTM D4169, Assurance Level II
MTTF	10 years+
Altitude	<2000 m (6562').
Pollution Degree	2.

Mechanical

Dimensions (WxHxD)	162 mm (6.38") x 110 mm (4.33") x 62 mm (2.44") including fixing lugs.
Weight	1800 g (3.9 lb).
Mounting	TS35 DIN Rail (EN50022).

Connectors

Power	
Connector type	2-way 2-part connector with rising cage clamp screw terminals.
Cable size	0.33 – 0.82 mm^2 (22 – 18 AWG).
RS-485 Ports	
Connector type	3-way 2-part connector with rising cage clamp screw terminals.
Cable size	0.33 – 0.82 mm^2 (22 – 18 AWG).
Ethernet Ports	RJ45.
USB	USB type C

Approvals and Certifications

- UL 916
- CE EN 61326-1
- RCM
- FCC Part 15 Subpart B, Class B
- FCC Part 15 Subpart C
- C-UL listed to Canadian Standards Association (CSA) C22.2 No. 205-M1983 "Signal Equipment"
- 1999/5/EC R&TTE Directive
- CCC
- SRRC
- RSS
- RoHS

EXPANSION MODULES

Electrical

Communications Ports	
HON-NXEM-LON	LONWORKS FTT-10A LON.
HON-NXEM-2x485	2 electrically isolated RS-485.
HON-NXEM-232	1 electrically isolated RS-232.

Mechanical

Dimensions (WxHxD)	62 mm (2.44") x 110 mm (4.33") x 61.1 mm (2.41") including fixing lugs.
Weight	
HON-NXEM-LON	132 g (0.29 lb).
HON-NXEM-2x485	129 g (0.28 lb).
HON-NXEM-232	118 g (0.26 lb).

Connectors	
HON-NXEM-LON	2-way 2-part connector with rising cage clamp screw terminals.
HON-NXEM-2x485	3-way 2-part connector with rising cage clamp screw terminals.
HON-NXEM-232	DB9 male connector.

Environmental

Ambient Limits	
Storage	-40 °C (-40 °F) to +85 °C (185 °F).
Operating	-20 °C (-4 °F) to +60°C (140 °F).
Humidity	5 to 95 %RH non-condensing.

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Trend Control Systems Limited

Unit C, Foundry Lane. Horsham, West Sussex, RH13 5YZ, UK. Tel: +44 (0)1403 211888, www.trendcontrols.com