IQ4/.../XNC/...

Description

The IQ®4's XNC functionality provides a way of interfacing the Trend system with 3rd party systems. It utilises standard IQ strategy modules, and the Trend Custom Language (TCL) to present information from other systems as though it is from an IQ controller. It also allows parameters within the 3rd party system to be adjusted from Trend supervisors and software tools.

The IQ422/00/XNC/.. has no I/O channels, but IQ422/12/XNC/.. has 12. The IQ4E/96/XNC/.., IQ4NC/16/XNC/.. and IQ4NC/32/XNC/.. have 16 I/O channels. External I/O modules enable the IQ4E/96/XNC/.. to be expanded to 96 I/O channels and the IQ4NC/32/XNC/.. to 32 I/O channels.
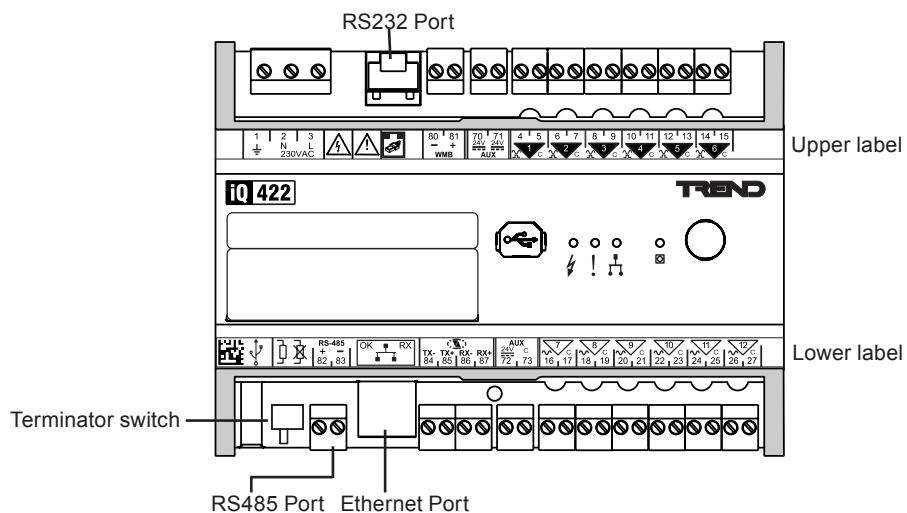
Features

- Flexible method of interfacing with 3rd party systems over RS232, RS485 and Ethernet.
- Uses Trend Custom Language (TCL).
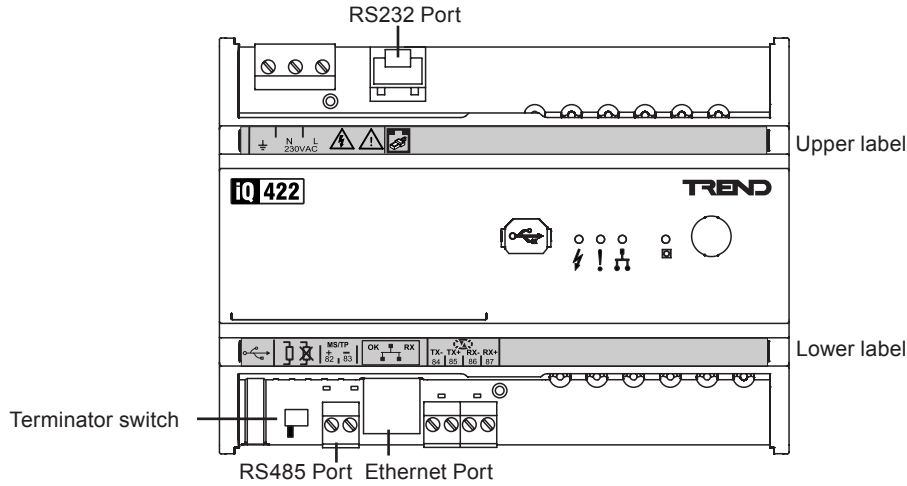- Standard IQ configuration modules.

Physical

This section highlights features relevant to the XNC functionality.

IQ422/12/XNC/..
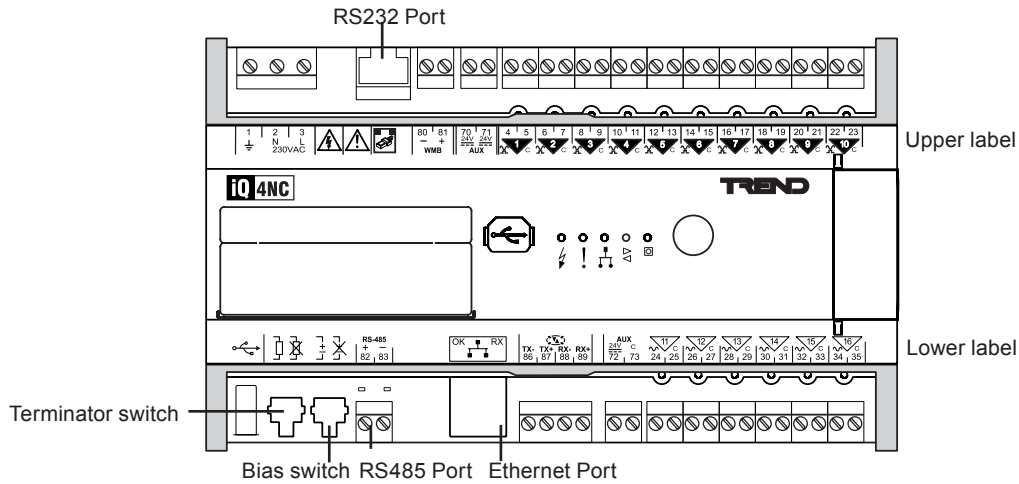For physical dimensions and other details see the IQ422 Controller Data Sheet (TA201260).

IQ422/00/XNC/..

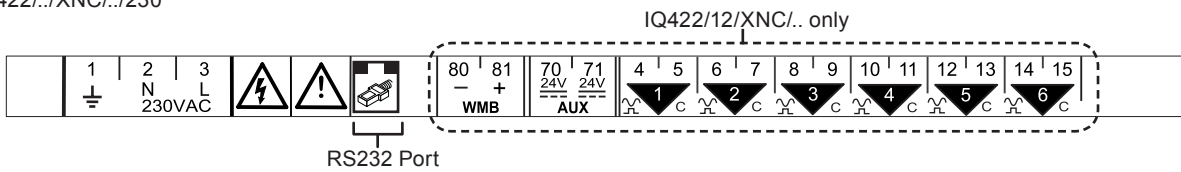IQ422/00/XNC diagram showing RS232 Port, Upper label, Lower label, Terminator switch, RS485 Port, Ethernet Port

IQ4E/96/XNC/..., IQ4NC/.../XNC/...

For physical dimensions and other details see the IQ4E/.. Controller Data Sheet (TA210340).

IQ4NC diagram showing RS232 Port, Upper label, Lower label, Terminator switch, Bias switch, RS485 Port, Ethernet Port

Terminal Labels
Upper Labels
IQ422/../XNC/../230

RS232 Port

IQ422/../XNC/../24VAC

RS232 Port
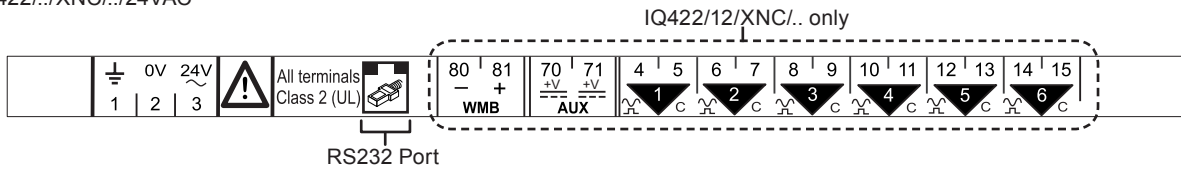
IQ4E../XNC/../230, IQ4NC/.../XNC/230

RS232 Port
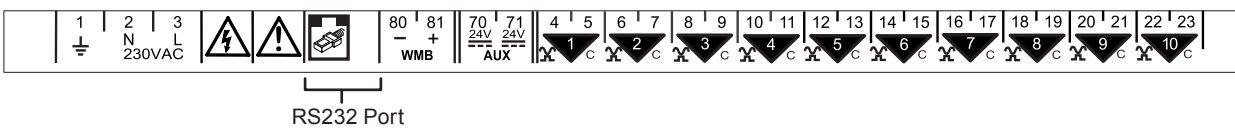
IQ4E../XNC/../24VAC, IQ4NC/.../XNC/24VAC

RS232 Port
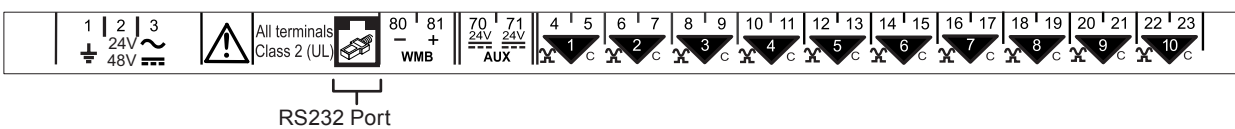
Lower Label

IQ422/../XNC/../...

IQ422/12/XNC/.. only

Terminator switch   RS485   Ethernet

IQ4E/96/XNC/..., IQ4NC/.../XNC/..

Terminator switch   RS485   Ethernet
Bias switch
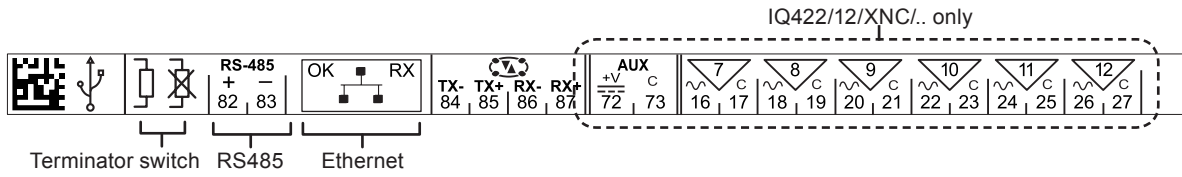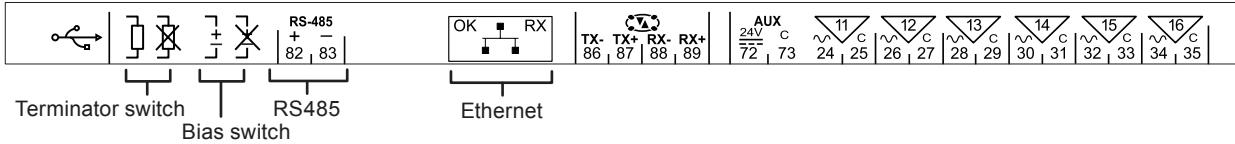
FUNCTIONALITY

Note: This data sheet describes the additional functionality of IQ4's /XNC variants. Standard IQ422 and IQ4E functionality is described in the IQ422 Controller Data Sheet (TA201260) and the IQ4E/.. Controller Data Sheet (TA210340). For standard functionality of the IQ4NC/.../XNC see the IQ4E/.. Controller Data Sheet (TA210340), details of its NC functionality are described in the IQ4NC Controllers Data Sheet (TA201285).

The IQ4's XNC functionality can be divided into three sections: System, Hardware, and Firmware.

SYSTEM

The IQ4's XNC functionality enables interfacing between the Trend system and 3rd party systems allowing information from 3rd party systems to appear as though from an IQ4 and values in the 3rd party system to be adjusted with Trend software. It is able to communicate with 3rd party systems over Ethernet, RS232, or RS485 and with other Trend devices.

RS232 Port

Used to connect to a 3rd party system that communicates over RS232, can be used with or without limited handshaking.

Note: If it is not being used to communicate with a 3rd party system it can be used as an RS232 (Local Supervisor Port) for connection of local display devices, or supervisory tools.

RS485 Port

Used to connect to a 3rd party system that communicates over 2 wire multidrop half duplex RS485. The IQ4's XNC is normally the master and other units on the bus are slaves. It can be set to a slave (using TCL) but not a peer. A maximum of two IQ4's are permitted on the bus due to biasing limits (see 'RS485 Terminator Switch' on page 4).

On IQ4NC/.../XNC it can be used to connect to the MS/TP trunk.

Note: If the IQ4NC/.../XNC is connecting to the MS/TP trunk the RS485 port cannot be used to interface to a 3rd party system.
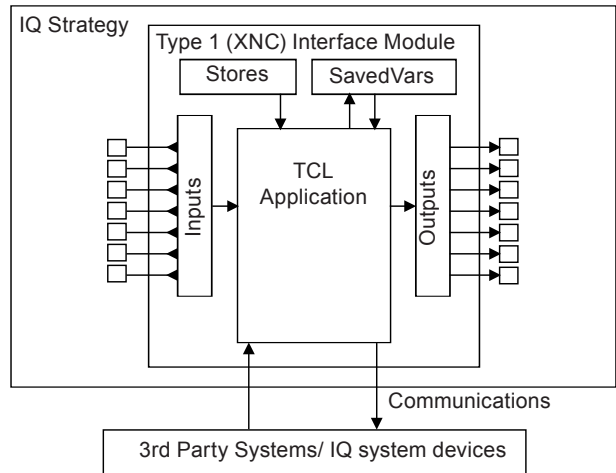
Ethernet Port

Used to connect to a 3rd party system that communicates over an Ethernet network using IP protocols. It is also able to provide the same Trend connectivity to a Trend LAN or internetwork as a standard IQ4.

Interface

The interface to the 3rd party system consists of two parts:

- IQ Strategy
- Type 1 (XNC) Interface Module

IQ Strategy
The IQ strategy (strategy) consists of a number of standard IQ strategy modules plus the Type 1 (XNC) Interface module that can be used to manipulate data. Information is passed into the Interface module by linking module values (e.g. Knob and Switch modules) in the strategy to the Interface module's Inputs. Information is passed from the Interface module to the strategy by linking the its outputs to module values (e.g. Sensor, and Digital Input modules) in the strategy.

Type 1 (XNC) Interface Module
The Type 1 (XNC) Interface module is the interface between the TCL application and the strategy, it also contains the TCL application.

It communicates with the 3rd party system. It can read and write values from the 3rd party system, via its inputs and outputs. It can also communicate with other Trend device over the Trend network, allowing data to be sent directly to other devices on the Trend system.

Note: There can be up to 1000 inputs or 1000 outputs, with a combined maximum of 1400 (e.g. 1000 inputs and 400 outputs).

For full details of the Type 1 (XNC) Interface Module see the IQ4 Configuration Manual (TE201263).

TCL Application
The interface is achieved using a program (TCL application) which determines the communications between the Trend system and the 3rd party system.

The TCL application is written in TCL (a programming language based on BASIC) using TCLTool2. A description of TCL can be found in the IQ4/XNC TCL Manual (TE201360).

TCLTool2 is only supplied to Trend Interface Specialist (TIS) employees who have completed appropriate training. They can provide both bespoke applications and generic applications for commonly used equipment. They may provide the application in soft format, or pre-loaded into the IQ4. The application can be tied to one IQ4 or available for general download.

HARDWARE

IQ422/.../XNC/...'s use the same hardware as the IQ422 - see IQ422 Data Sheet (TA201260). IQ4E/.../XNC's and IQ4NC/.../XNC's use the same hardware as the IQ4E - see the IQ4E Data Sheet (TA210340). However the RS485 port, RS485 terminator switch and bias switch are operational.

RS485 Terminator Switch

This is used to switch the integral 120 ohm terminating resistor in or out of circuit.

RS485 Bias Switch (IQ4E/../XNC, IQ4NC/16, IQ4NC/32)

IQ4E/.../XNC...'s, IQ4NC/16/... and IQ4NC/32/... have a bias switch which determines whether bias is applied.

Note: For IQ422/.../XNC/...'s bias is permanently applied and cannot be disabled. There shouldn't be any more than two devices on the bus that add bias.

FIRMWARE

The firmware in the IQ4 controls its basic functionality and provides a range of modules that can be configured to produce a control strategy.

Modules

The range of modules provided in the firmware of the /XNC variants is the same as a standard IQ4 - see the IQ422 Controller Data Sheet (TA201260), or IQ4E/.. Controller Data Sheet (TA210340) plus the Type 1 (XNC) Interface module and Type 17 (XNC Serial) Network module. Full details of these modules can be found in the IQ4 Configuration Manual (TE201263).

Module	BrIQs	Max. number of Modules
Type 1 (XNC) Interface	136+brIQs for the TCL application. TCL application uses 20 brIQs per line and 5 brIQs per store, SavedVar, input and output.	1
Type 17 (XNC Serial)	N/A	1

The quantity of each type of module may be adjusted to match the requirements of the application subject to the following:

▪ A maximum of 4000 modules in total,
▪ A maximum for each type of module, and
▪ The IQ4's memory capacity (measured in 'brIQs).

The total available memory capacity varies with the IQ4 variant:

IQ4 Variant	Maximum brIQs available.
IQ422/12/XNC/...	30000
IQ422/00/XNC/...	60000
IQ4E/96/XNC/...	60000
IQ4NC/.../XNC/...	30000

The maximum number of sequence steps varies with the IQ4 variant:

IQ4 Variant	Maximum Sequence Steps.
IQ422/12/XNC/...	600
IQ422/00/XNC/...	1280
IQ4E/96/XNC/...	1280
IQ4NC/16/XNC/...	600
IQ4NC/32/XNC/...	640

FIELD MAINTENANCE

The IQ4/.../XNC/... and IQ4NC/.../XNC/.. require no routine maintenance.

> **WARNING:** Contains no serviceable parts. Do not attempt to open the unit. Failure to comply may cause damage to the unit.

DISPOSAL

COSHH (Control of Substances Hazardous to Health - UK Government Regulations 2002) ASSESSMENT FOR DISPOSAL OF IQ4/.../XNC/....

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, and product should be disposed of by a suitable recycling centre.

Do not dispose of with normal household waste.
Do not burn.

COMPATIBILITY

See the IQ422 Controller Data Sheet (TA201260) or IQ4E/.. Controller Data Sheet (TA210340) for general compatibility. For the IQ4NC/.../XNC see the IQ4E/.. Controller Data Sheet (TA210340) and IQ4NC Controllers Data Sheet (TA201285). Any differences are shown below.

Interface Networks: RS232, RS485 2 wire (4 wire supported using 3rd party adaptor), and Ethernet.

If using an IQ3 /XNC TCL application it may require minor changes - see the IQ4/XNC TCL Manual (TE201360). The SETLED Function is supported, but cannot control the indicators.

INSTALLATION

The IQ4/.../XNC/...'s installation follows the same process as that for standard IQ4s except for the connection of the RS232, RS485 ports, and writing the TCL application.

A full description of installing the unit is given in the IQ4NC, IQ422 Installation Instructions - Mounting (TG201264) IQ4NC, IQ422 Installation Instructions - Configuration (TG201265), IQ4E/.., IQ4NC/16/.., IQ4NC/32/.. Installation Instructions - Mounting (TG201338), IQ4NC/XNC, and IQ4E/.. IQ4NC/16/..., IQ4NC/32/... Installation Instructions - Configuring (TG201339).

ORDER CODES

IQ422/12/XNC/BAC/24VAC :IQ422 with 24 Vac supply, XNC functionality, Ethernet and BACnet over IP with 6 universal inputs and 6 analogue voltage outputs.

IQ422/12/XNC/BAC/230 :IQ422 with 230 Vac supply, XNC functionality, Ethernet and BACnet over IP with 6 universal inputs and 6 analogue voltage outputs.

IQ422/12/XNC/LAN/BAC/24VAC :IQ422 with 24 Vac supply, XNC functionality, Ethernet, Trend current loop Lan and BACnet over IP with 6 universal inputs and 6 analogue voltage outputs.

IQ422/12/XNC/LAN/BAC/230 :IQ422 with 230 Vac supply, XNC functionality, Ethernet, Trend current loop Lan and BACnet over IP with 6 universal inputs and 6 analogue voltage outputs.

IQ422/00/XNC/BAC/24VAC :IQ422 with 24 Vac supply, XNC functionality, Ethernet and BACnet over IP without inputs or outputs.

IQ422/00/XNC/BAC/230 :IQ422 with 230 Vac supply, XNC functionality, Ethernet and BACnet over IP without inputs or outputs.

IQ422/00/XNC/LAN/BAC/24VAC :IQ422 with 24 Vac supply, XNC functionality, Ethernet, Trend current loop Lan and BACnet over IP without inputs or outputs.

IQ422/00/XNC/LAN/BAC/230 :IQ422 with 230 Vac supply, XNC functionality, Ethernet, Trend current loop Lan and BACnet over IP without inputs or outputs.

IQ4E/96/XNC/BAC/230 :IQ4E with 230 Vac supply, XNC functionality, Ethernet and BACnet over IP, expandable to 96 I/O channels.

IQ4E/96/XNC/LAN/BAC/230 :IQ4E with 230 Vac supply, XNC functionality, Ethernet Trend current loop Lan and BACnet over IP, expandable to 96 I/O channels.

IQ4E/96/XNC/BAC/24VAC :IQ4E with 24 Vac supply, XNC functionality, Ethernet and BACnet over IP, expandable to 96 I/O channels.

IQ4E/96/XNC/LAN/BAC/24VAC :IQ4E with 24 Vac supply, XNC functionality, Ethernet Trend current loop Lan and BACnet over IP, expandable to 96 I/O channels.

IQ4NC/16/XNC/230 :IQ4NC with 230 Vac supply, XNC functionality, Ethernet and BACnet over IP, and 10 universal inputs and 6 analogue voltage outputs.

IQ4NC/32/XNC/230 :IQ4NC with 230 Vac supply, XNC functionality, Ethernet and BACnet over IP, expandable to 32 I/O channels.

IQ4NC/16/XNC/24VAC :IQ4NC with 24 Vac supply, XNC functionality, Ethernet and BACnet over IP, and 10 universal inputs and 6 analogue voltage outputs.

IQ4NC/32/XNC/24VAC :IQ4NC with 24 Vac supply, XNC functionality, Ethernet and BACnet over IP, expandable to 32 I/O channels.

SPECIFICATIONS

See the IQ422 Controller Data Sheet (TA201260) or IQ4E/.. Controller Data Sheet (TA201340) for specifications and certifications. Differences described below.

ELECTRICAL

Input power supply voltage

IQ422/00/XNC/…/230	:230VAC ±10% 50/60 Hz, 20 VA max.
IQ422/00/XNC/…/24VAC	:24VAC ±10% 50/60 Hz, 20 VA max.
IQ422/12/XNC/…/230	:230VAC ±10% 50/60 Hz, 44 VA max.
IQ422/12/XNC/…/24VAC	:24VAC ±10% 50/60 Hz ,28 VA max.
IQ4E/96/XNC/…/230	:230 :Vac ±10% 50/60 Hz, 70 VA max.
IQ4E/96/XNC/…/24VAC	:24 Vac ±10% 50/60 Hz ,44 VA max or :48 Vdc ±15% 0.67A, 32 W
IQ4NC/.../XNC/230	:230 Vac ±10% 50/60 Hz, 70 VA max
IQ4NC/.../XNC/24VAC	:24 Vac ±10% 50/60 Hz, 44 VA max or :48 Vdc ±15% 0.67A, 32 W

RS232 Port

Connector	:RJ11 (FCC68)
Transmission	:RS232, EIA/TIA/232E, V28
Distance	:15 m (16 yards) maximum
Supply	:24 Vdc ±5%; 60 mA max

Note: Supply shared with other outputs; see 'Combined Supply' on IQ422 Controller Data Sheet (TA201260) or IQ4E/.. Controller Data Sheet (TA201340).

Baud rate	:9k6.

RS485 Port

Connector	:2 wide 2 part screw terminals for 0.5 to 2.5 mm² cross section area (14 to 20 AWG) cables.
Distance	Dependent on cable type and wire gauge as specified in EIA-485.
Signalling	:RS485 signalling transceiver standard
Baud rate	:9k6 to 76k8 baud.
Termination	:100 to 130 ohms matched each end
Terminator	:Integral terminator 120 ohms. Can be switched in or out.
Bias	:Can be switched on or off (IQ4E or IQ4NC/.../XNC only).

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