Data Sheet

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

IQ422/.../XNC/...

Description

The IQ®422'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.

Note: This data sheet describes the additional functionality of IQ422's /XNC variants. Standard IQ422 functionality is described in the IQ422 Controller Data Sheet (TA201260).

Features

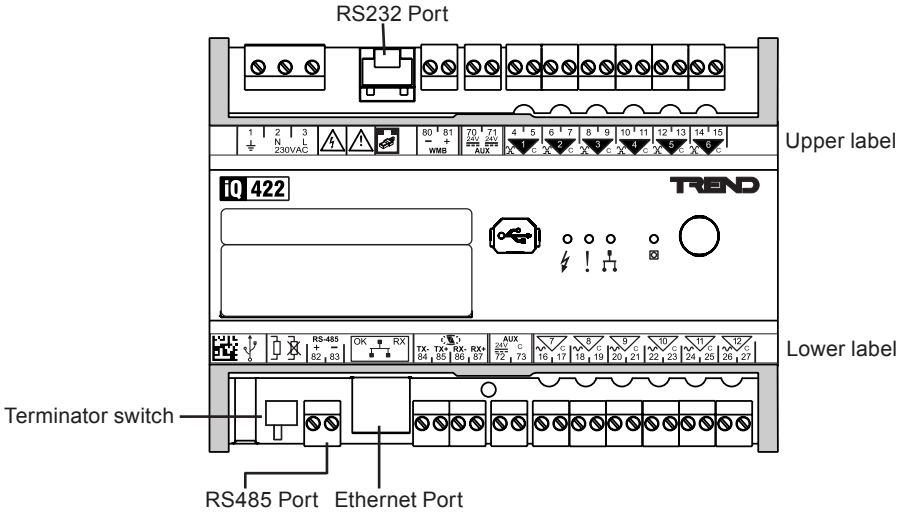
- Flexible method of interfacing with 3rd party systems over RS232, RS485 and Ethernet.
- Uses Trend Custom Language (TCL).
- Standard IQ configuration modules.

Physical

This section highlights features relevant to the XNC functionality.

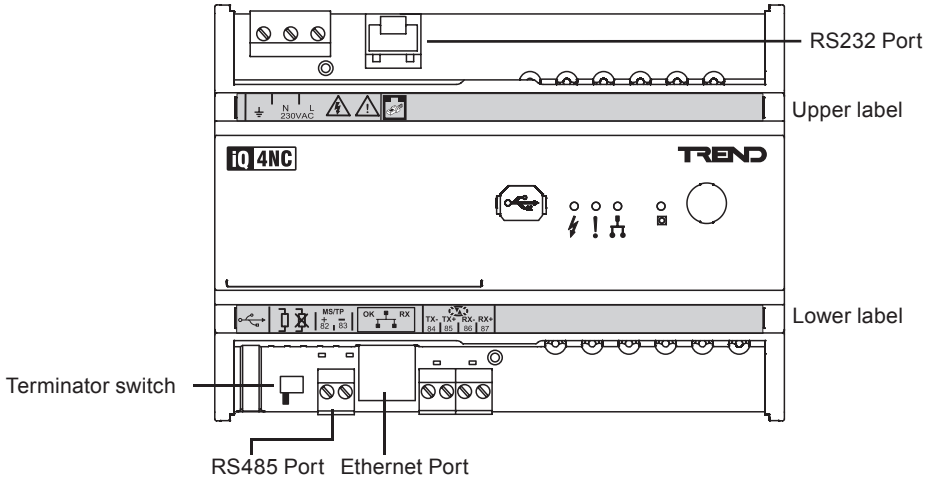
For physical dimensions and other details see the IQ422 Controller Data Sheet (TA201260).

IQ422/12/XNC/..

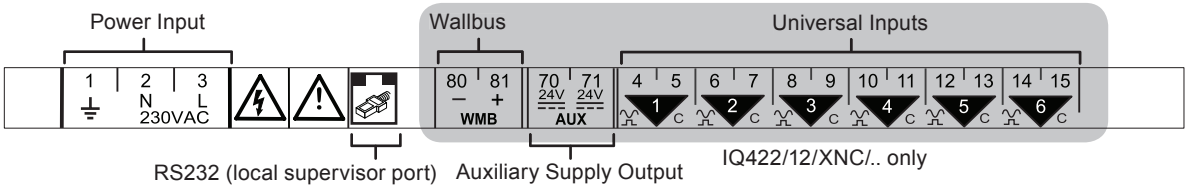


Physical (continued)

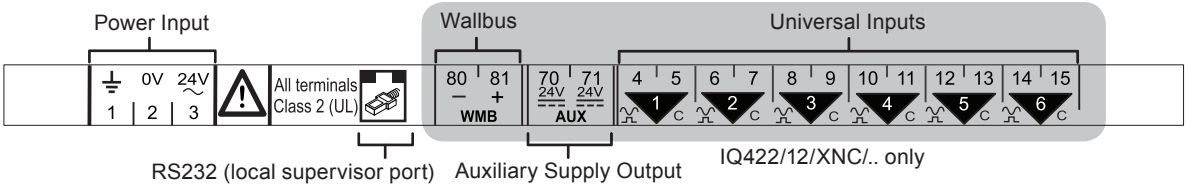
IQ422/00/XNC/..



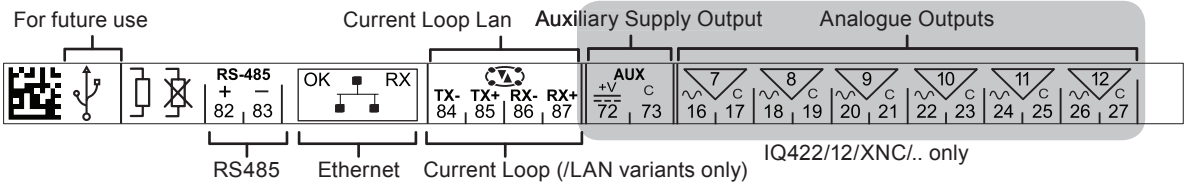
Terminal Labels
Upper Labels
IQ422/../XNC/../230



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



Lower Label
IQ422/../XNC/../230 and IQ422/../XNC/../24VAC



FUNCTIONALITY

The IQ422/.../XNC/...'s 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 (Local Supervisor 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 Connector

Used to connect to a 3rd party system that communicates over 2 wire multidrop half duplex RS485. The IQ422/.../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 IQ422/.../XNC/... controllers are permitted on the bus due to biasing limits (see 'RS485 Terminator Switch' on page 3).

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.

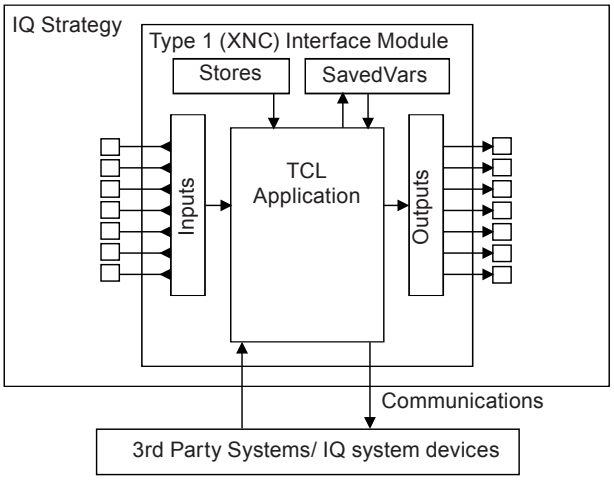
Current Loop (../LAN variants only)

Used to connect the IQ422/.../XNC/... to a Trend LAN on the current loop network.

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, however the RS485 connector, RS485 indicators, and RS485 terminator switch are operational.

RS485 Indicators

Indicate the state of the RS485 communications.

TX: (yellow) is illuminated when the interface is transmitting, and extinguished when it is receiving. It normally flashes as communications proceed.

RX: (yellow) is illuminated when the interface is receiving, and extinguished when it is transmitting. It normally flashes as communications proceed.

RS485 Terminator Switch

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

Note: 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 IQ422/.../XNC/... 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 IQ422/.../XNC/... firmware is the same as a standard IQ422 - see the IQ422 Controller Data Sheet (TA201260), 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 IQ422/.../XNC/...'s memory capacity (measured in 'brIQs).

The total available memory capacity varies with the IQ422/.../XNC/... variant:

IQ422/.../XNC/... Variant	Maximum brIQs available.
IQ422/12/XNC/..	30000
IQ422/00/XNC/..	60000

The maximum number of sequence steps for IQ422/00/XNC/.. is 1280 and for IQ422/12/XNC/.. is 600.

FIELD MAINTENANCE

The IQ422/.../XNC/... requires 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 IQ422/.../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) for general compatibility, differences are described 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 IQ422/.../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.

Installation is described in the IQ4NC, IQ422 Controllers Installation Instructions - Mounting (TG201264), and IQ4NC, IQ422 Installation Instructions - Configuring (TG201265).

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.

SPECIFICATIONS

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

ELECTRICAL

Input power supply voltage
- IQ422/00/XNC/.../230 :230VAC ±10% 50/60 Hz at up to 20 VA
- IQ422/12/XNC/.../230 :230VAC ±10% 50/60 Hz at up to 44 VA
- IQ422/00/.../24VAC :24VAC ±10% 50/60 Hz at up to 20 VA
- IQ422/12/.../24VAC :24VAC ±10% 50/60 Hz at up to 28 VA

RS232 Supervisor 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).*
- Baud rate :9k6.

RS485 Port
- Connector :2 wide 2 part screw terminals for 0.5 to 2.5 mm^2 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 on or out.

INDICATORS

RS485 Indicators
- TX :Yellow LED
- RX :Yellow LED

Please send any comments about this or any other Trend technical publication to techpubs@trendcontrols.com

Trend Control Systems Limited

Albery House, Springfield Road, Horsham, West Sussex, RH12 2PQ, UK. Tel:+44 (0)1403 211888 Fax:+44 (0)1403 241608 www.trendcontrols.com