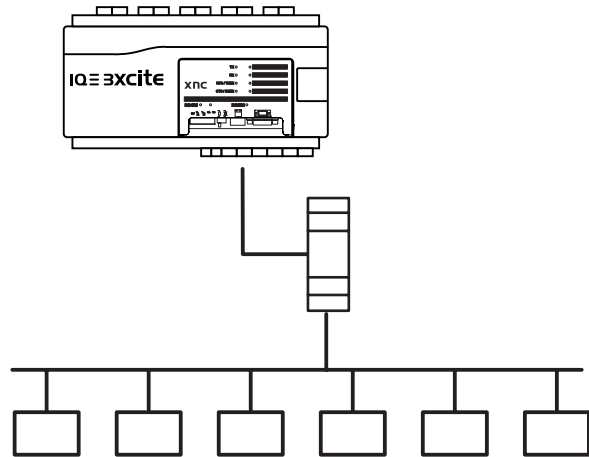


# IQ3/XNC MODBUS Driver TCL Application

## IQ3/XNC MODBUS Driver



### Description

IQ3/XNC3 MODBUS Driver is a Trend Custom Language (TCL) that enables values from devices on MODBUS to be read into the strategy of an IQ3/XNC. It also enables values from the strategy to be written to values in the MODBUS devices.

The driver is available with two different communications options (TCP/IP, and serial) and in two different sizes (35 data requests and 185 data requests) making a total of four different variants. The variants are functionally the same, the only difference is the number of data requests, number of inputs and outputs available and the communications method.

### Features

- Read from MODBUS devices.
- Write to MODBUS devices.
- TCP/IP or serial communication options.
- Available in two different sizes (35 data requests and 185 data requests) to allow for different controller, and strategy requirements.

## FUNCTIONALITY

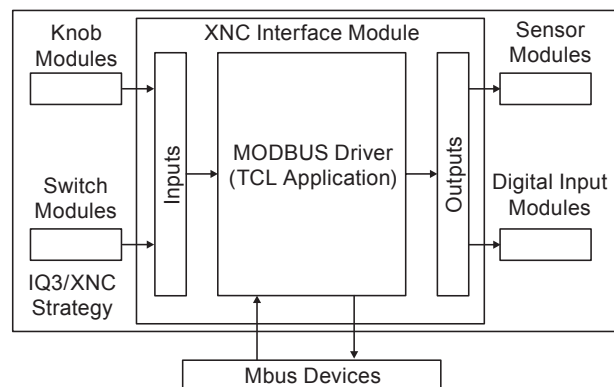
IQ3/XNC3 MODBUS Driver is a Trend Custom Language (TCL) that enables values from devices on MODBUS to be read into the strategy of an IQ3/XNC. It also enables values from the strategy to be written to values in the MODBUS devices.

There are four variants of the driver with different numbers of data requests, inputs, outputs, and different communications options. See the table below.

Communications Option	Data Requests	Inputs	Outputs	BriQs
IP	35	20	85	10005
	185	150	400	12980
Serial	35	20	85	9565
	185	150	400	12540

Each driver variant uses a different number of BriQs, this allows a different number of devices, and has a different number of outputs. Therefore when selecting which driver variant to use you should consider the number of BriQs available in the IQ3/XNC that is to be used, as well as the method of connecting to the MODBUS, number of data request that are required, the number of outputs required to the strategy and number of inputs required from the strategy. For details of the number of BriQs the IQ3/XNC see the IQ3./.../XNC/... Controller/Interface Data Sheet (TA200219).

Data read from the device is stored in the IQ3/XNC's TCL Interface module's outputs. These objects can then be used in the IQ3/XNC's strategy. Data that is to be written to the device is taken from the IQ3/XNC's TCL Interface module's inputs. These inputs can be modified from the IQ3/XNC's strategy.



The number of data requests determines the number of different requests for information that can be set up. Each data request could request information for more several sequential values. Each data request is configured in one of the TCL interface module's stores therefore the number of data request is the number of stores available for this purpose.

**FUNCTIONALITY** (continued)

The data request specifies the device containing the values, the value, and the type of value.

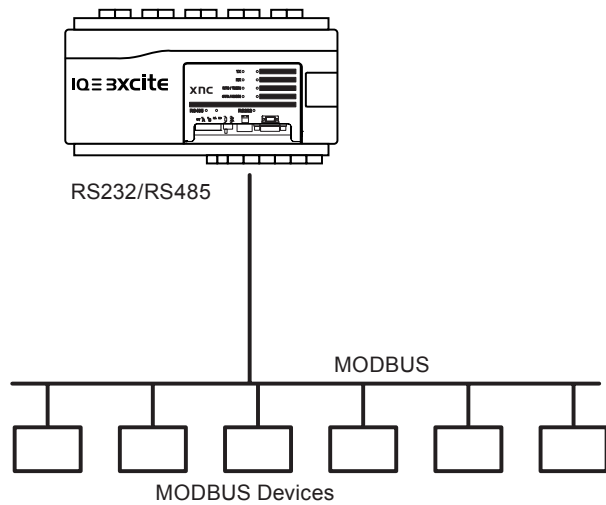
**Configuration:** Once installed the driver is configured using SET. The configuration involves specifying the values to be read and the TCL interface module's outputs, using codes in the TCL interface module's stores. The TCL interface module's must also be linked the to required place in the controller's strategy, and the strategy configured as required.

The communication settings used for communications over the MODBUS are specified in the TCL interface module's stores. The determine the necessary information for communications. In the case of the TCC/IP variants the also determine the Server being used to connect to the MODBUS. If required other servers can be specified enabling the driver to connect to more than one server.

*Note that the driver can only connect to one server at a time, and a delay of 100s is required when switching between servers.*

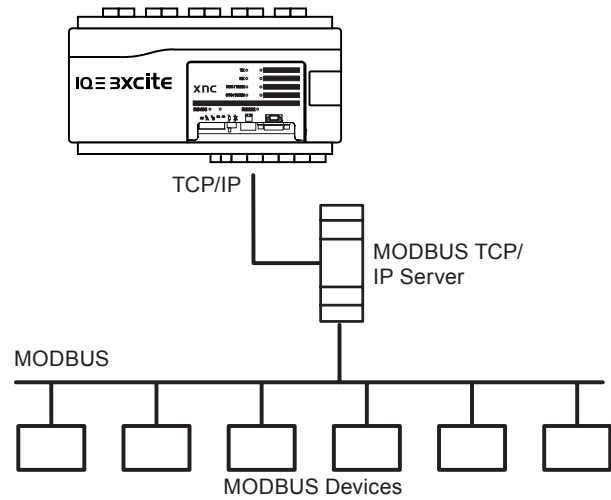
Connection to the MODBUS is made from the IQ3/XNC using either a serial connection or a TCP/IP connection.

When connecting using a serial connection the connection between the MODBUS and the IQ3/XNC can be made using either the IQ3/XNC's RS232, or RS485 connector.



See the 'Connections' section of this data sheet for more details.

When connecting using a TCP/IP connection a MODBUS server is required. Communication between the server and the IQ3/XNC is over Ethernet be made using the IQ3/XNC's Ethernet connector. If required the driver can connect to more than one server (only one at a time).



*Note that some MODBUS devices have their own MODBUS server. This means that to obtain data from different devices the driver must change connections this takes at least 100 seconds.*

**COMPATIBILITY**

**MODBUS**

The driver can connect to the MODBUS using either a serial or TCP/IP connection. It supports the following MODBUS functions

Function	Description
01	Multiple-bit read (Read Coil).
02	Multiple-bit read (Read Discrete Input)
03	Multiple-word read (Read Holding Registers)
04	Multiple-word read (Read Input Registers)
05	Bit write (Write Single Coil).
06	Word write (Write Single Holding Register).
16	Multiple-word write (Write Multiple Holding Registers)

The driver supports the following data formats for reading data:

Format	Description
00	Direct read. 2 byte format.
04	IEEE value. 4 byte format.
05	Direct read with bit 16 containing sign (value range -32767 to +32768). 2 byte format.
06	IEEE configuration. Used for EM/MPO and SIRIO meters. 2 byte format.
07	BCD

Format	Description
09	Allows a bit mask to be applied to a 16 bit word. E.g. a bit mask retrieving bits 5 and 9 would be 0000001000100000.
10	Allows a 32 bit value to be read. Some electricity meters store values as 32 bit. Only direct read is available for this format. Any conversion should be performed by the strategy in the IQ3/XNC. 4 byte format

The driver supports the following formats for writing data:

Format	Description
00	Direct write
04	IEEE value

**Trend**

The IQ3/XNC MODBUS Driver is compatible with all IQ3 controllers that have the XNC functionality (IQ3/XNC), and requires SET v6.5 or greater to enable the configuration of the IQ3/XNC.

## INSTALLATION

The IQ3/XNC MODBUS Drivers are installed with SET 6.5 or greater. If they are not installed they can be downloaded from our support web site (<http://pnet.trend-controls.com>) and installed by copying the files to the correct folder on your PC.

Once the driver has been installed on your PC it is necessary to configure the driver. You will need: SET v6.5 or greater, the driver, an IQ3/XNC, and converter or server to interface between the IQ3/XNC and the MODBUS.

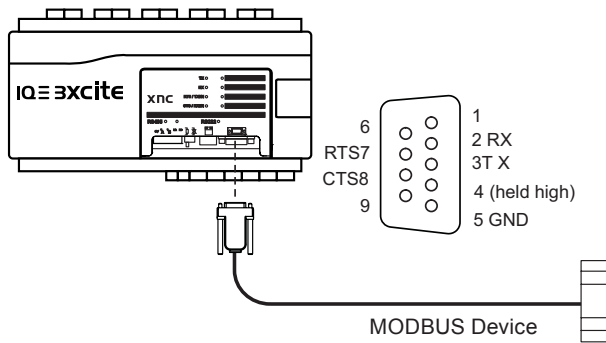
The basic installation procedure is described below:

- Install the MODBUS devices according to the manufacturer's instructions.
- Install the IQ3/XNC as described in the supplied Installation Instructions.
- Connect the IQ3/XNC to the MODBUS devices.
- Configure the driver.
- Configure the IQ3/XNC's strategy.
- Test the operation of the driver to ensure that the required values are read from and written to the MODBUS devices, and that the controller's strategy works correctly.

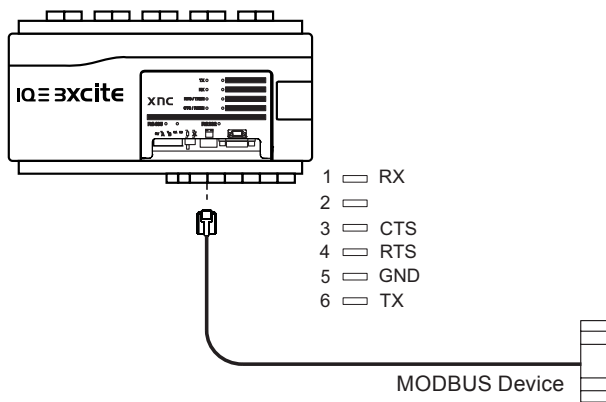
## CONNECTIONS

### Serial

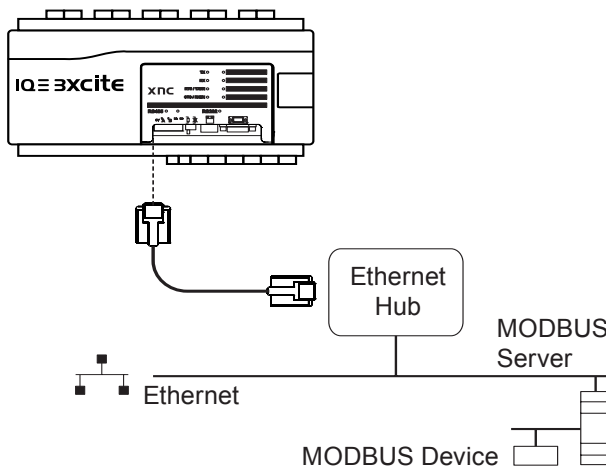
RS232 with 9 Way D type connector



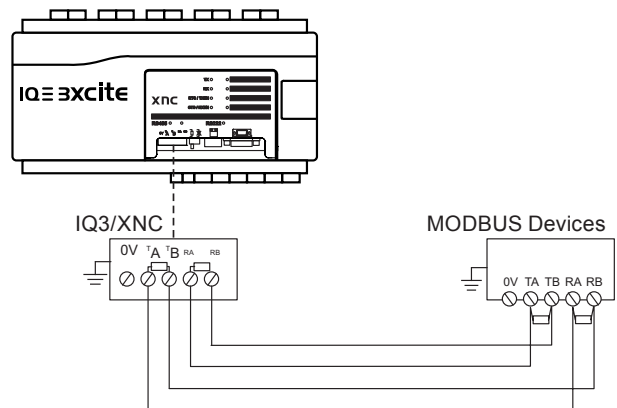
RS232 with RJ11 connector



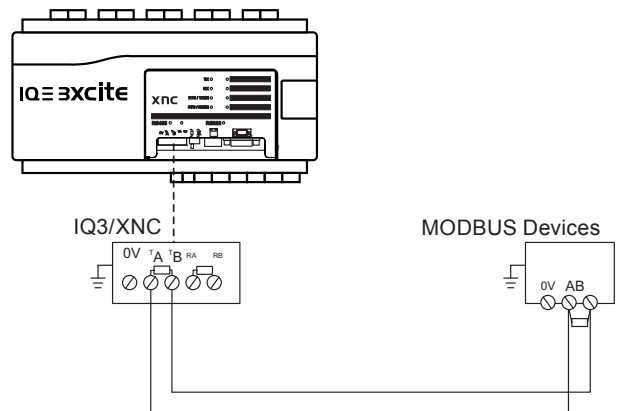
### TCP/IP



4 wire RS485



2 wire RS485



## ORDER CODES

The drivers are supplied with SET v6.5 or are available as a free download for our support web site (<http://pnet.trend-controls.com>).

In order to use the driver an IQ3/XNC is required to run the TCL. This must be purchased separately, and you should ensure that it has a large enough BrIQ count to fit the required driver, and the strategy. See the IQ3 Web Enabled Controllers Data Sheet (TA200505) for details of the number of BrIQs available in each IQ3/ XNC variant.

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## SPECIFICATIONS

### Communications options

Serial	RS232 with 9 Way D type connector, RS232 with RJ11 connector, 4 wire RS485, 2 wire RS485
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TCP/IP

### Max number of data requests

Large driver	185
Xact driver	35

### Max number outputs

Large driver	400
Xact driver	85

### Max number inputs

Large driver	150
Xact driver	20

### BrIQ sizes

Large driver	12540 on serial variant, and 12980 on TCP/IP variant
Xact driver	9565 on serial variant, and 10005 on TCP/IP variant

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