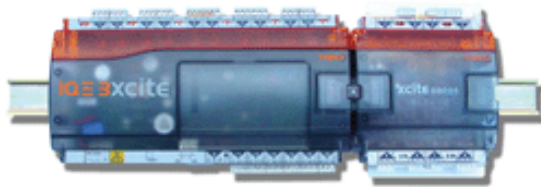


SYNAPSYS
SOLUTIONS LTD
● controls & integration specialists ●

IQ3 XNC TO MITSUBISHI G50



Synapsys Solutions Ltd

59 High Street
Hurstpierpoint
West Sussex
BN6 9RE
United Kingdom

Tel 01273 831831

Fax 01273 831631

sales@synapsys-solutions.com

www.synapsys-solutions.com



The G50 gateway is a device that allows the connection of a Mitsubishi AC system to a BMS for monitoring or control purposes, as well as acting as a central controller. The G50 communicates to the AC network using a Mitsubishi proprietary protocol and makes the information available to be read or changed by third parties. The protocol it uses for that is XML.

XML is a language similar to HTML but that doesn't define any tags: all the tags are user defined. Further, it doesn't define how the information is going to be displayed, but the information structure and content.

The physical layer connection it provides for the XML interrogation is Ethernet RJ45. The connection is made by using TCP/IP, being the G50 a server to which clients can connect and read or write information.

The IQ3 XNC is the interface product from Trend that allows Ethernet connections. It is programmed in TCL (Trend Custom Language) and provides a script area where to implement the protocol driver, and a normal controller area identical to one in a normal IQ3.

This interface implements a basic XML driver to communicate to the G50 to monitor and control any unit attached to the G50.

IQ3XNC Settings

In order to configure the interface to work there are some settings:

- G50 IP Address:
 - o It is optional. If omitted, the interface will use 192.168.1.1
 - o Given as a Store module with label "G50IPAddress".
- Number of units (groups):
 - o It is optional. If omitted, the interface will look for 50 units.
 - o Given as a store module with label "NoOfUnits".
- Force feedback on output connectives:
 - o TCL communicates with the strategy through the special connectives Inputs (strategy to TCL) and Outputs (TCL to strategy). This option allows enabling the interface to update the output connectives on the read/write points even if the input for that point already contains the read value from the unit. This is useful for when the input is going to be disconnected from the output to put some logic in between. Without this option the output wouldn't reflect the unit's real value all the time.
 - o Given as a store module with label "AlwaysUpdateOutput".
 - o Default is off. Set to 1 to turn it on.

These settings are refreshed every cycle, as well as every 100 failed attempts to connect to the G50. This last ensures that if the IP settings are changed, the interface will try to connect to the new IP address.

Points available

The points that we implement in this interface are:

Point	Possible Values	IQ Point	Description
AlarmCode	An integer number	S	Error code of the unit.
Drive	ON - 1 OFF - 0	W	AC on/off selection.
Mode	COOL - 1 DRY - 2 FAN - 3 HEAT - 4 AUTO - 5 AUTOHEAT - 6* AUTOCOOL - 7* HEATRECOVERY - 8 LC_AUTO - 9 BYPASS - 10	K	AC operation mode. * are read only.
SetTemp	17 to 30	K	Setpoint.
InletTemp	0.0 to 99.9	S	Temperature reading.
AirDirection	HORIZONTAL - 1 MID1 - 2 MID2 - 3 VERTICAL - 4 SWING - 5	K	Position of the louver.
FanSpeed	LOW - 1 MID2 - 2 MID1 - 3 HIGH - 4	K	AC fan speed.
FilterSign	ON - 1 OFF - 0	I	Filter dirty signal.
ErrorSign	ON - 1 OFF - 0	I	Error signal.

Sensor reading and error code have plots associated to them.

Programming the IQ3XNC

In order to program the interface, open the project "IQ3XNC To G50" and download the strategy to the controller, ticking the option "Download XNC Application".

If any setting has to be changed, browse the controller in "System View" and go to the "Scripted" module. Expand until the store modules are visible. Right click on the "Value" you want to change and click on "Properties". Type the value you require and then click "Write".



Timing

The length of a refresh cycle depends considerably on the health of the network connection, but as an approximation, the interface will refresh 50 units in between 1:15 minutes and 1:45 minutes. Every end of cycle, there are 2 seconds delay before the new cycle starts.

LEDs

There are four user LEDs on the IQ3XNC expansion board. This interface uses them in the following manner (starting from the top one):

- (Orange) The first LED will be on for 2 seconds between cycles. You can use this if you want to time a cycle or to count the units the interface is requesting every cycle.
- (Green) The second LED will flash once per read operation. For every unit there are two read operation, so this LED should flash 100 times if we are reading 50 units, and then LED 1 will be on before a new cycle of 100 read operations occurs.
- (Red) The third LED will flash with LED 2 when reading normally, but depending on the health of the network it may not sometimes. If it stays permanently on, it means the interface can't connect to the G50, so it may be that the IP settings are wrong, the network is broken, or the G50 is not online.
- (Orange) The fourth LED shouldn't go on, either, although again it may if the network is slow and we get timeouts when reading. Basically it will stay on from a timeout until we succeed reading. In most cases it will operate in conjunction with LED 3, since rarely we will get a connection to the G50 but no response to a request.