Tech-note

Connecting UniOP to Mitsubishi Q Series with Ethernet

This Technical Note contains the information needed to connect UniOP to Mitsubishi Q Series controllers using an Ethernet connection to the Ethernet module in the PLC.
The Mitsubishi Q Ethernet communication driver is delivered with the Designer file D32uplc205.dll.

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Tn224
Ver. 1.00
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1 Introduction

To create a Designer project for Ethernet communication to the Mitsubishi Q Series, select the driver "Mitsubishi Q ET" from the list of drivers in the Configure Controller… dialog box.

The Series Q controller must be equipped with an appropriate Ethernet interface. The following Ethernet communication modules can be used for communication:
QJ71E71-100

The operator panel must be equipped with the optional SCM11 communication module to support Ethernet TCP/IP communication.
UniOP currently supports only 10 Mb Ethernet over twisted pair.

Note: *The TCM10 Ethernet module* ***cannot*** *be used for connection to the Mitsubishi Q SeriesPLCs.*

2 Configuration with Designer

The UniOP project file must be properly configured for Ethernet communication with Mitsubishi controllers.

2.1 Panel Setup

The UniOP panel must be assigned a unique IP address.
There are multiple ways to assign an IP address to the panel; please refer to the User's Manual for detailed instructions.
The "Ethernet Board" option must be enabled in the Panel Setup dialog box under the tab "External Devices".
The panel IP address may be defined in the field "Ethernet Board" as shown in Figure 3 below.

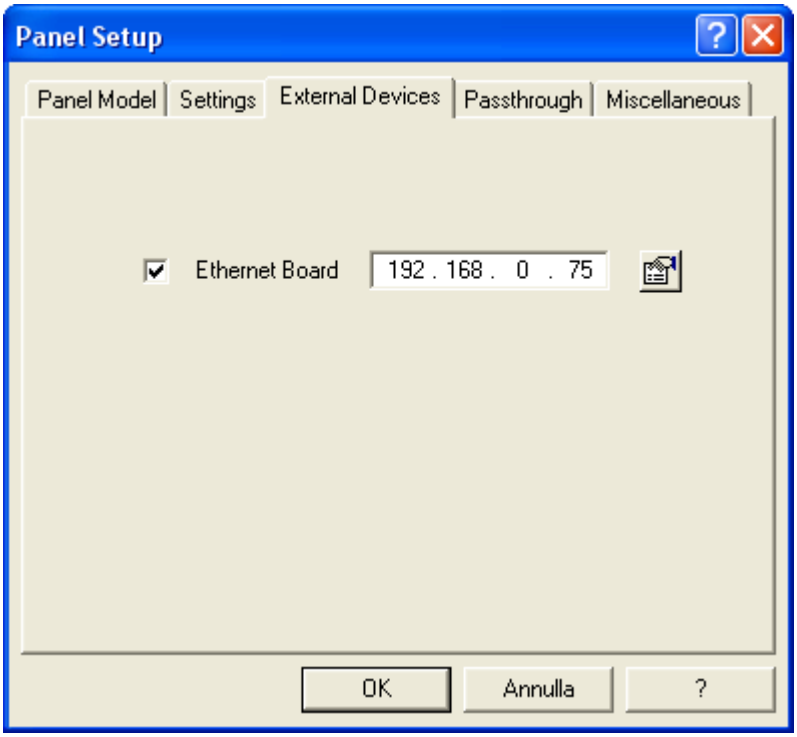

Figure 1 – IP Address in Panel Setup

If the field contains the IP address 0.0.0.0, then the panel will derive the IP address using one of the alternate methods.

2.2 Controller Setup

Figure 2 shows the Designer Controller Setup dialog box for the Mitsubishi Q ET driver.
The Ethernet IP address of the controller connected to the operator panel must be entered in the "IP address" field.
The field "Port" contains the port number used in the communication with the PLC. Most application will use the default value.

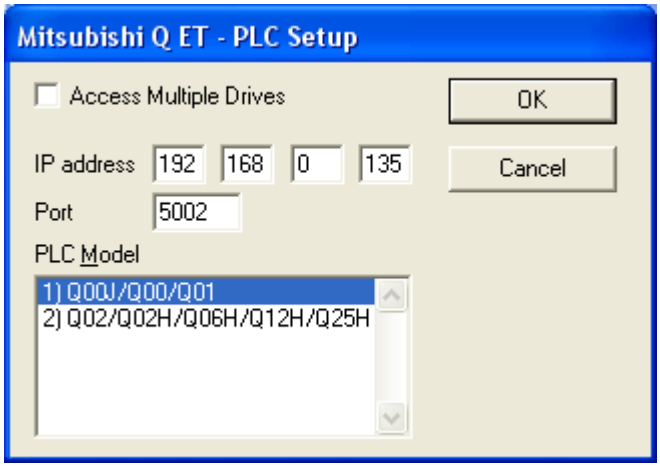

Figure 2– Controller Setup dialog box

The protocol implementation supports the connection of multiple controllers to one operator panel, as shown in Figure 3. To set-up multiple connections, check the “Access Multiple Drives” checkbox in the Controller Setup dialog box, see Figure 2.

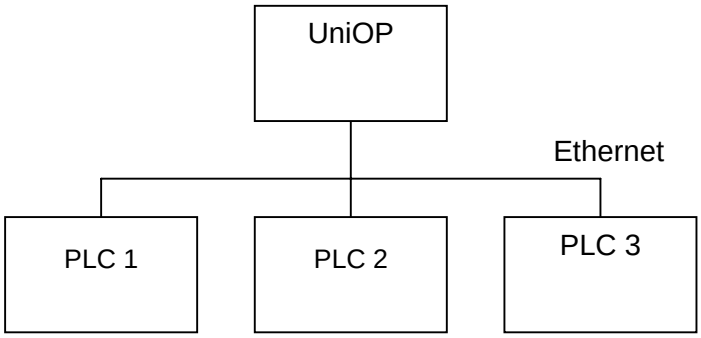

Figure 3– Multiple controller connection

Depending on the PLC configuration, there is also the possibility to connect more than one panel to the same controller. Please refer to the Mitsubishi manual for instructions about how to configure the number of available connections.

2.3 RDA Setup

The Real Time Clock information in the Reserved Data Area (RDA) is coded in binary and is arranged as shown in Table 1.

Dn	0	Day of the week
Dn+1	Day	Month
DBn+2	Year	Hour
DBn+3	Minutes	Seconds

Table 1. RTC information in the RDA

The page number displayed and the page number requested in the RDA are coded in binary.
The RDA can be freely positioned within the Data Registers in the PLC memory.

For the parts of the RDA organized in bits (Keyboard Status, LED Control, Alarms, UniOP Status Word and PLC Command Word), the first bit in the RDA corresponds to the first bit in the PLC (i.e. the LSB bit in the register). For example, if the Keyboard Status area is positioned at address D0, then the key F1 will be mapped to bit 0, the key F8 will be mapped to bit 7 and so on as listed in Table 2.

	.15	.14	.13	.12	.11	.10	.9	.8	.7	.6	.5	.4	.3	.2	.1	.0
D0	F16	F15	F14	F13	F12	F11	F10	F9	F8	F7	F6	F5	F4	F3	F2	F1
D1																F17

Table 2. RDA bit information

Similarly, if the UniOP Status Word is positioned at the address D12, then the status bit S0 will be mapped to D12.0, the bit S7 will be mapped to D12.7 while the bit S8 will be mapped to D13.0.

3 PLC Configuration

The Mitsubishi Q system must be properly configured for Ethernet communication using the Mitsubishi GX Developer software version 7 or higher.
The Figure 4 below shows an example of network configuration for Ethernet communication.

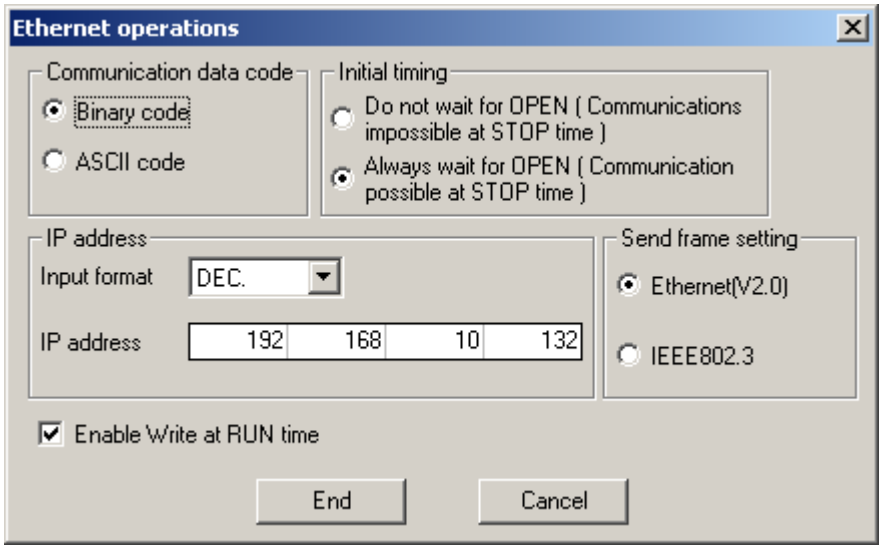

Figure 4

Please note that UniOP supports only Binary code communication.

Appendix A. Communication Error Codes

Current communication status is displayed on the system page of the UniOP. Beside the string, describing current state of the communication (OFF, ON, ERR), there is an additional error code representing the last (which may be not the current one) error encountered. The codes are:

Code	Description	Notes
00	No error	There are no communication errors and there have been no errors since start-up.
04	Negative ACK	The PLC has rejected the request
05	Time-out (receiving)	The panel has not received a response from the PLC within the timeout interval
07	Unable to open socket	
08	Unexpected response format	
09	Connection time-out	Failed to connect to PLC or failed to send request