



Bulletin 1203-GK5 / 1336-GM5

Bulletin 1203-GU6 / 1336-GM6

Control via PCCC Messaging

December 30, 1998

Purpose

The purpose of this document is to provide guidelines for wiring and control schemes for SCANport devices including Bulletin 1305 and 1336 PLUS AC Drives. This document is a suggestion only. Users must ensure that installations meet applicable codes and are suitable for the existing conditions.

What This Note Contains

This document contains information and an example ladder program that demonstrates how to control a 1305 or 1336 PLUS drive with a MicroLogix 1000 using a 1761-NET-DNI to connect via DeviceNet to a 1203-GU6 / 1336-GM6 Enhanced DeviceNet to SCANport module. The information and example program shown also work with a 1203-GK5 / 1336-GM5 DeviceNet to SCANport module equipped with firmware version 2.001 or later. Further, the example program can easily be adapted for use with an SLC-500 or PLC-5.

Intended Audience

This application note should be used by personnel familiar with the hardware components and programming procedures necessary to operate SCANport devices. It is also assumed that the user has some familiarity with the MicroLogix 1000, DeviceNet, and ladder programming.

Where It Is Used

The diagrams, parameter settings and auxiliary hardware used in this application note are designed to address specific issues in many different applications. Some changes by the user may be necessary to apply the concepts of this document to a specific application.

Application Considerations

These example ladder programs were written to be simple and clear examples. They may not perform all the required functions of a particular application. Consult the product manuals for more information.

This application note applies only to 1203-GU6 / 1336-GM6 modules and 1203-GK5 / 1336-GM5 modules with firmware versions of 2.001 or later.

As with any networked drive application, a hardwired stop circuit should be provided.

Definitions

- | | |
|---------------------|--|
| GK5,
GM5,
Gx5 | A 1203-GK5 or 1203-GM5 DeviceNet to SCANport module. This application note applies only to Gx5 modules having version 2.001 or later firmware. |
| GU6,
GM6,
Gx6 | A 1203-GK6 or 1203-GM6 Enhanced DeviceNet to SCANport module. The Gx6 includes all of the functionality of the Gx5 plus enhancements. The GU6 includes a serial port that is not present on the GK5. |
| PCCC | Programmable Controller Communications Commands – the messages sent and received by Allen-Bradley PLC's |



THEORY OF OPERATION

Both the Gx5 (with firmware version 2.001 or later) and the Gx6 are capable of receiving PCCC messages over a DeviceNet network. The 1203-GU6 is also capable of receiving PCCC messages using DF1 protocol through an RS-232 connection. One use for these messages is to read or write parameters within the adapter or the attached product. Another use is to control the attached product.

The table below shows one of the 'N' files present within the Gx5 and Gx6 modules. This file is used as the target file addresses of PCCC messages that read status information from or write command information to the attached product.

File Address	Definition When Read	Definition When Written
N41:0	Logic Status	Logic Command
N41:1	Feedback	Reference
N41:2	Datalink A1 (from drive)	Datalink A1 (to drive)
N41:3	Datalink A2 (from drive)	Datalink A2 (to drive)
N41:4	Datalink B1 (from drive)	Datalink B1 (to drive)
N41:5	Datalink B2 (from drive)	Datalink B2 (to drive)
N41:6	Datalink C1 (from drive)	Datalink C1 (to drive)
N41:7	Datalink C2 (from drive)	Datalink C2 (to drive)
N41:8	Datalink D1 (from drive)	Datalink D1 (to drive)
N41:9	Datalink D2 (from drive)	Datalink D2 (to drive)

A PCCC message can be used to read from any of the addresses in N41 anytime that function has been enabled. If, for example, Datalink A is enable but Datalink B is not, a read of N41:2 will return the data read from the drive via Datalink A1 while a read from N41:4 will return an error.

In order to write data to the N41 file, a PCCC message must first write a non-zero value into N42:3. This address is a Control Timeout value in seconds. Once this value is written to a non-zero value, the first PCCC write to N41 will be successful and will activate the timer. After the timer is activated, each read or write of the N41 file will reset the timer. If the timer expires, the Gx5 or Gx6 will follow the action configured for a Communications Loss. The table below shows the actions that can be taken upon a timeout.

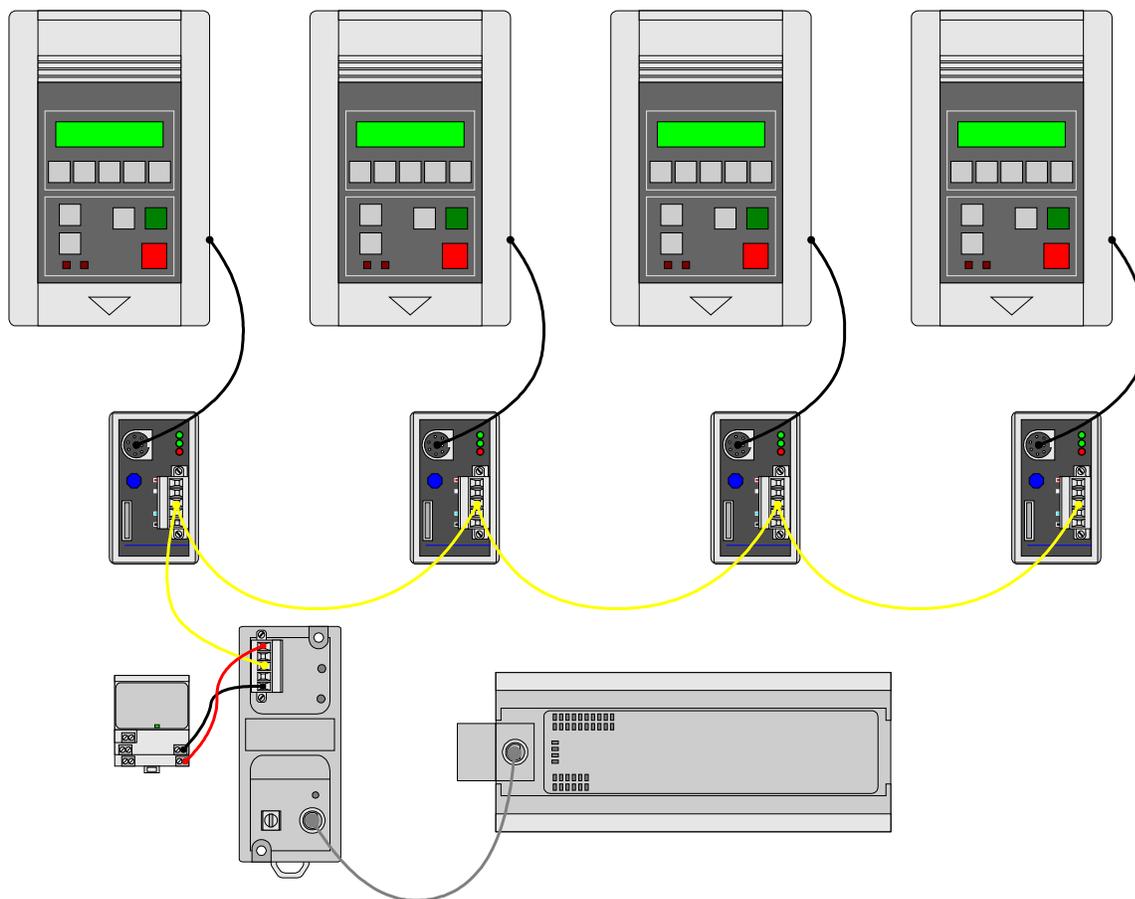
Gx5	Gx6	Explanation
Fault (default setting)	Fault (default setting)	The module causes a serial fault in the attached product by stopping SCANport communications
Hold Last	Hold Last	The module continues to send data to the attached product, the data sent contains the last data received by the module
Zero Data	Zero Data	The module continues to send data to the attached product, all of the data sent is set to zero values
	Fault Config Data	The module continues to send data to the attached product, the data sent contains user selected values

If the Control Timeout (N42:3) is written with a value of zero, the adapter will no longer allow writes to the N41 file and will not cause a fault in the drive.

NETWORK WIRING EXAMPLES

DeviceNet via 1761-NET-DNI

The MicroLogix 1000 is connected to the 1761-NET-DNI with a 1761-CBL-AM00 cable. The DNI is then connected to the DeviceNet network. The DeviceNet network is connected to the 1203-GU6 modules which are connected to the 1305 drives with SCANport cables. A small 24vdc power supply is used to provide power to the DeviceNet network.



Note that the serial ports on the GU6 modules are free for use with DriveExplorer or DriveTools. Gx5 modules (with firmware version 2.001 or later) or GM6 modules could be used instead of the GU6 modules.

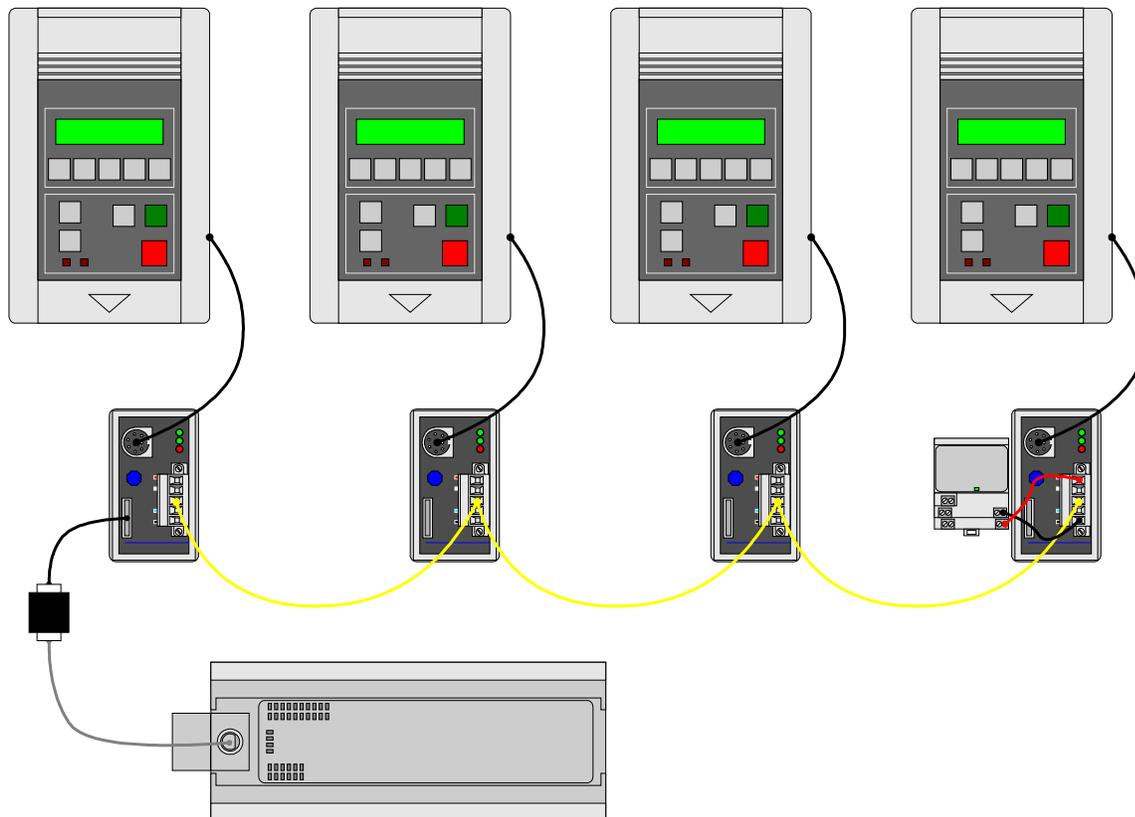
Each 1203-GU6 module should be set to use a unique node address and the correct DeviceNet data rate. This can be accomplished with DeviceNet Manager, RSNetWorx for DeviceNet, DriveExplorer, or terminal emulation software such as HyperTerminal.

The 1761-NET-DNI should also be set to use a unique node address and the correct DeviceNet data rate. The DNI should also be configured for the DF1 baud rate and device type (MicroLogix). This can be accomplished with DeviceNet Manager or RSNetWorx for DeviceNet.

The MicroLogix 1000 should also be set to use the same node address and the DF1 baud rate as the DNI. This can be accomplished with RSLogix500.

DeviceNet via 1203-GU6

The MicroLogix 1000 is connected to the 1203-GU6 with a combination of a 1761-CBL-PM02 (MicroLogix to PC cable), a 1203-SNM (serial null modem adapter) and a 1203-SFC (serial flash cable). The DeviceNet network is connected to the 1203-GU6 modules which are connected to the 1305 drives with SCANport cables. A small 24vdc power supply is used to provide power to the DeviceNet network.



Note that the serial ports on the remaining GU6 modules are free for use with DriveExplorer or DriveTools. Gx5 modules (with firmware version 2.001 or later) or GM6 modules could be used instead of the GU6 modules.

Each 1203-GU6 module should be set to use a unique node address and the correct DeviceNet data rate. The 1203-GU6 connected serially to the MicroLogix 1000 should be configured to use the correct DF1 baud rate. All of this can be accomplished with DeviceNet Manager, RSNetWorx for DeviceNet, DriveExplorer, or terminal emulation software such as HyperTerminal.

The MicroLogix 1000 should also be set to use a unique node address and the DF1 baud rate. This can be accomplished with RSLogix500.



MICROLOGIX EXAMPLE LADDER PROGRAM

The program shown in this section was developed with RSLogix 500 for the MicroLogix 1000. This program would also work with the SLC-500 or PLC-5 with only minor changes.

The first step in controlling the drive is to set the control timeout. Rung #0 (shown below) does this. The message must be sent successfully at least once before N41 can be written (note that the drive's status information can be read from N41 without setting the timeout). The setup screen for the MSG instruction is shown below rung #0.

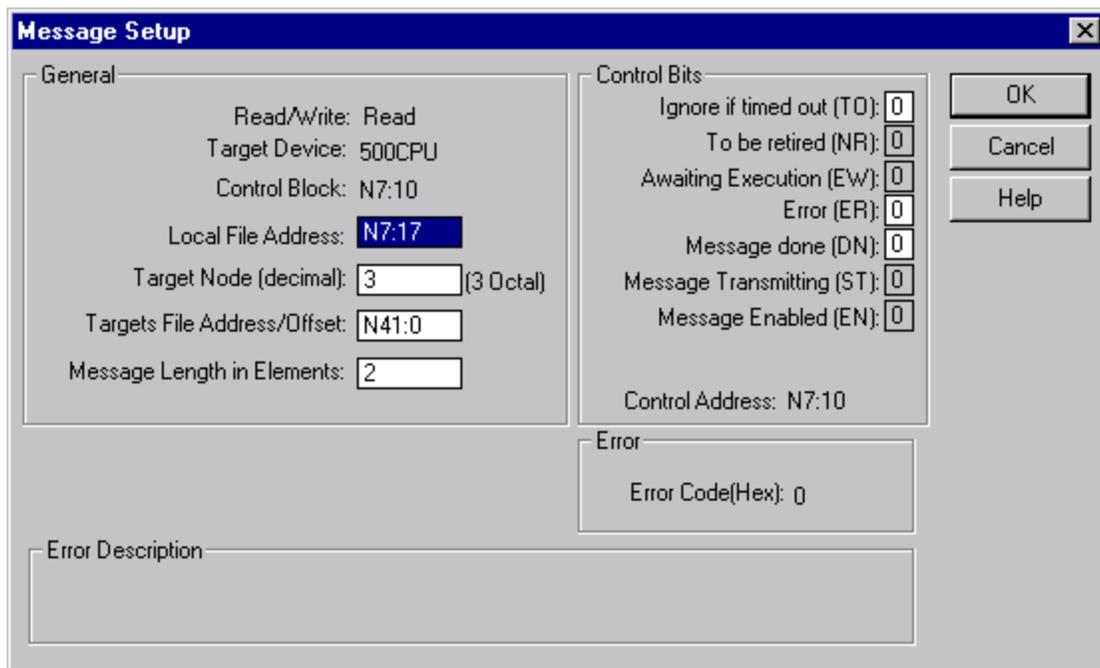
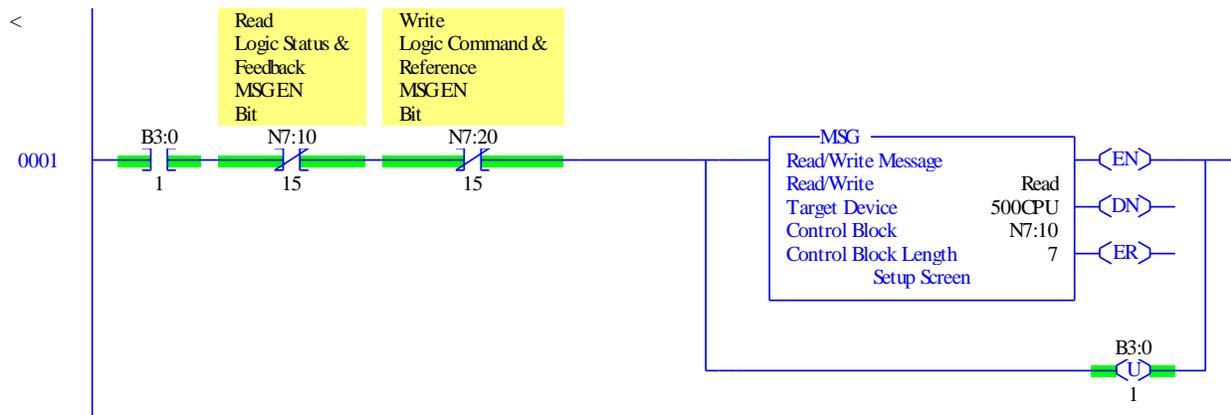


Message Setup [X]

<p>General</p> <p>Read/Write: Write</p> <p>Target Device: 500CPU</p> <p>Control Block: N7:0</p> <p>Our Source File Address: N7:7</p> <p>Target Node (decimal): <input type="text" value="3"/> (3 Octal)</p> <p>Targets Destination File Address: <input type="text" value="N42:3"/></p> <p>Message Length in Elements: <input type="text" value="1"/></p> <p>Error Description: <input style="width: 100%; height: 20px;" type="text"/></p>	<p>Control Bits</p> <p>Ignore if timed out (TO): <input type="text" value="0"/></p> <p>To be retired (NR): <input type="text" value="0"/></p> <p>Awaiting Execution (E'W): <input type="text" value="0"/></p> <p>Error (ER): <input type="text" value="0"/></p> <p>Message done (DN): <input type="text" value="0"/></p> <p>Message Transmitting (ST): <input type="text" value="0"/></p> <p>Message Enabled (EN): <input type="text" value="0"/></p> <p>Control Address: N7:0</p> <p>Error</p> <p>Error Code(Hex): <input type="text" value="0"/></p>
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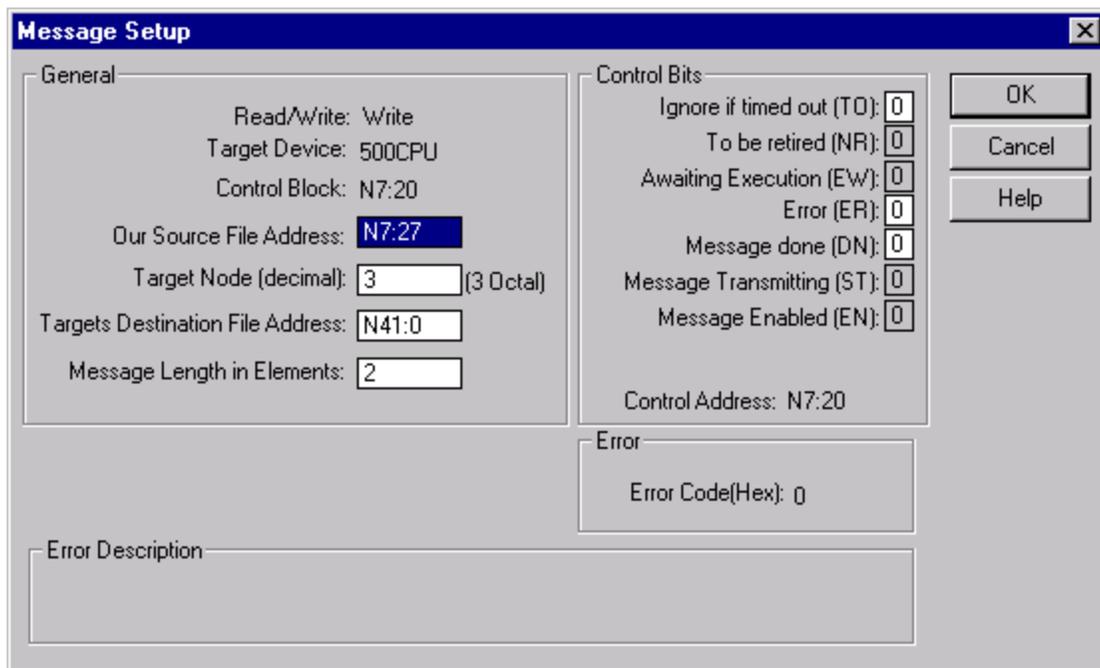
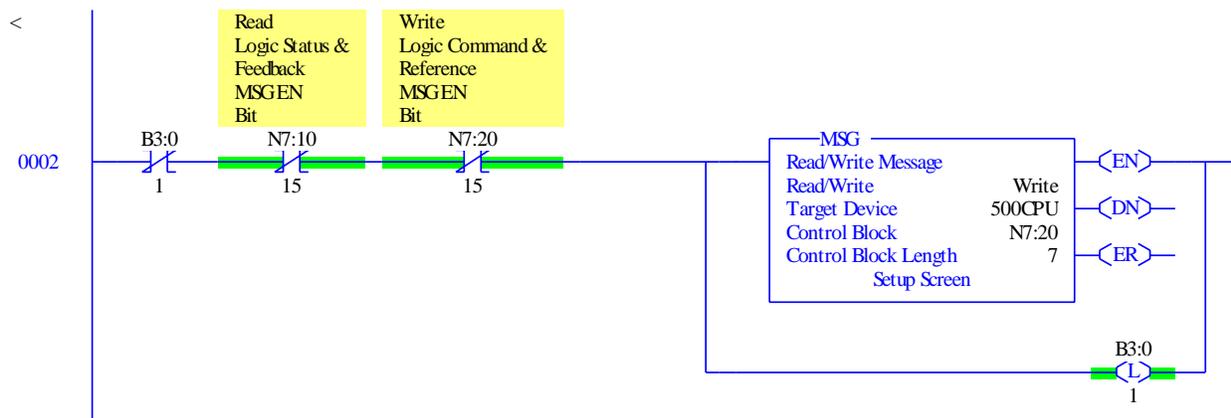


Rung #1 (shown below) reads words 0 and 1 from the N41 file. This obtains the Logic Status (word 0) and Feedback (word 1) from the drive. This rung should be programmed so as to alternate execution with rung #2.





Rung #2 writes words 0 and 1 to the N41 file. This sends the Logic Command (word 0) and Reference (word 1) to the drive. This rung should be programmed so as to alternate execution with rung #1.





Rungs #3 and #4 are a simple means of starting and stopping the drive. Note that the STOP and START inputs must be present long enough for the program to transfer the Logic Command to the adapter before they are removed or the drive will not react to them. This program includes no logic to do this as the logic required will vary based on many factors.

