Toyoda Machine Works

Toyoda Machine Works Toyopuc Ethernet PC3J (TCP/IP) Driver

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- This manual explains how to connect the target machine with devices from other manufacturers. For information about how to use the Pro-Designer software, please refer to the Pro-Designer Online Help.
- The types of target machines that are compatible with Pro-Designer depends on the Pro-Designer version. For information about target machine compatibility, please refer to the Pro-Designer Online Help.

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1 System Structure

The following table describes the basic system setup for connecting the target machine to Toyoda Machine Works PLCs using an Ethernet connection.

Series	CPU	Ethernet Module
TOYOPUC PC3J	PC3J PC3JD	EN-I/F

MEMO

- Use a 10BASE-T connection for PS Series Type G, PS Series Type P, and GP2000 Series target machines.
- Up to 16 PLCs can be connected to the target machine.

2 Supported Device Addresses

The following table lists the device address ranges you can enter from the Device Address keypad. For actual device address ranges supported by the PLC, refer to the corresponding PLC manual. Supported device addresses differ from protocol to protocol and between PLC models.

Device	Bit Address[*1*2]	Word Address[*3]	16 bit	32 bit
Input Relay	1X000-1X7FF	1X00W-1X7FW		
	2X000-2X7FF	2X00W-2X7FW		
	3X000-3X7FF	3X00W-3X7FW		
Output Relay	1Y000-1Y7FF	1Y00W-1Y7FW		
	2Y000-2Y7FF	2Y00W-2Y7FW		
	3Y000-3Y7FF	3Y00W-3Y7FW		
Internal Relay	1M000-1M7FF	1M00W-1M7FW		
	2M000-2M7FF	2M00W-2M7FW		
	3M000-3M7FF	3M00W-3M7FW		
Keep Relay	1K000-1K2FF	1K00W-1K2FW		
	2K000-2K2FF	2K00W-2K2FW		
	3K000-3K2FF	3K00W-3K2FW		
Link Relay	1L000-1L7FF	1L00W-1L7FW		
	2L000-2L7FF	2L00W-2L7FW		
	3L000-3L7FF	3L00W-3L7FW		
Special Relay	1V00-1VFF	1V0W-1VFW		
	2V00-2VFF	2V0W-2VFW		
	3V00-3VFF	3V0W-3VFW		
Edge Relay	1P000-1P1FF	1P00W-1P1FW		
	2P000-2P1FF	2P00W-2P1FW	L/H[*4]	L/H[*4]
	3P000-3P1FF	3P00W-3P1FW		
Timer	1T000-1T1FF	1T00W-1T1FW		
	2T000-2T1FF	2T00W-2T1FW		
	3T000-3T1FF	3T00W-3T1FW		
Counter	1C000-1C1FF	1C00W-1C1FW		
	2C000-2C1FF	2C00W-2C1FW		
	3C000-3C1FF	3C00W-3C1FW		
Data Register	1D0000:0-1D2FFF:F	1D0000-1D2FFF		
	2D0000:0-2D2FFF:F	2D0000-2D2FFF		
	3D0000:0-3D2FFF:F	3D0000-3D2FFF		
Link Register	1R000:0-1R7FF:F	1R000-1R7FF		
	2R000:0-2R7FF:F	2R000-2R7FF		
	3R000:0-3R7FF:F	3R000-3R7FF		
Special Register	1S000:0-1S3FF:F	1S000-1S3FF		
	2S000:0-2S3FF:F	2S000-2S3FF		
	3S000:0-3S3FF:F	3S000-3S3FF		
Current Value Register	1N000:0-1N1FF:F	1N000-1N1FF		
	2N000:0-2N1FF:F	2N000-2N1FF		
	3N000:0-3N1FF:F	3N000-3N1FF		

continued...

Device	Bit Address *1*2	Word Address *3	16 bit	32 bit
File Register	B0000:0-B1FFF:F	B0000-B1FFF	L/H*4	L/H*4
Exp. Input Relay	EX000-EX7FF	EX00W-EX7FW		
Exp. Output Relay	EY000-EY7FF	EY00W-EY7FW		
Exp. Internal Relay	EM0000-EM1FFF	EM000W-EM1FFW		
Exp. Keep Relay	EK000-EKFFF	EK00W-EKFFW		
Exp. Link Relay	EL0000-EL1FFF	EL000W-EL1FFW		
Exp. Special Relay	EV000-EVFFF	EV00W-EVFFW		
Exp. Edge Relay	--	--		
Exp. Timer	ET000-ET7FF	ET00W-ET7FW		
Exp. Counter	EC000-EC7FF	EC00W-EC7FW		
Exp. Special Register	ES000:0-ES7FF:F	ES000-ES7FF		
Exp. Current Register	EN000:0-EN7FF:F	EN000-EN7FF		
Exp. Setting Value Register	H0000:0-H7FF:F	H000-H7FF		
Exp. Data Register	U0000:0-U7FFF:F	U0000-U7FFF		

*1 Read-modify-write. When you write to one of these bit addresses, the target machine reads the entire word address, sets the defined bit, then returns the new word address to the PLC. If the ladder program writes data to this word address during the bit read/write process, the resulting data may be incrorrect.

*2 You can use bit devices for discrete, integer, float, and string data. To use a bit device as a word address, replace the last digit in the bit address with "W."
e.g. 1X0A0 > 1X0AW

*3 You can use word devices for discrete, integer, float, and string data. To use a word device as a bit address, add a colon followed by the bit position (0-F) at the end of the word.
e.g. EN0000:9

*4 16-bit and 32-bit data, High and Low, refer to data as defined in the following examples.

16 bit

Byte				
0	7	...	0	L (Low)
1	15	...	8	H (High)

32 bit

Word				
0	15	...	0	L (Low)
1	31	...	16	H (High)

3 Consecutive Device Addresses

The following table lists the maximum number of consecutive addresses that can be read by each PLC. Refer to this table when using block transfers.

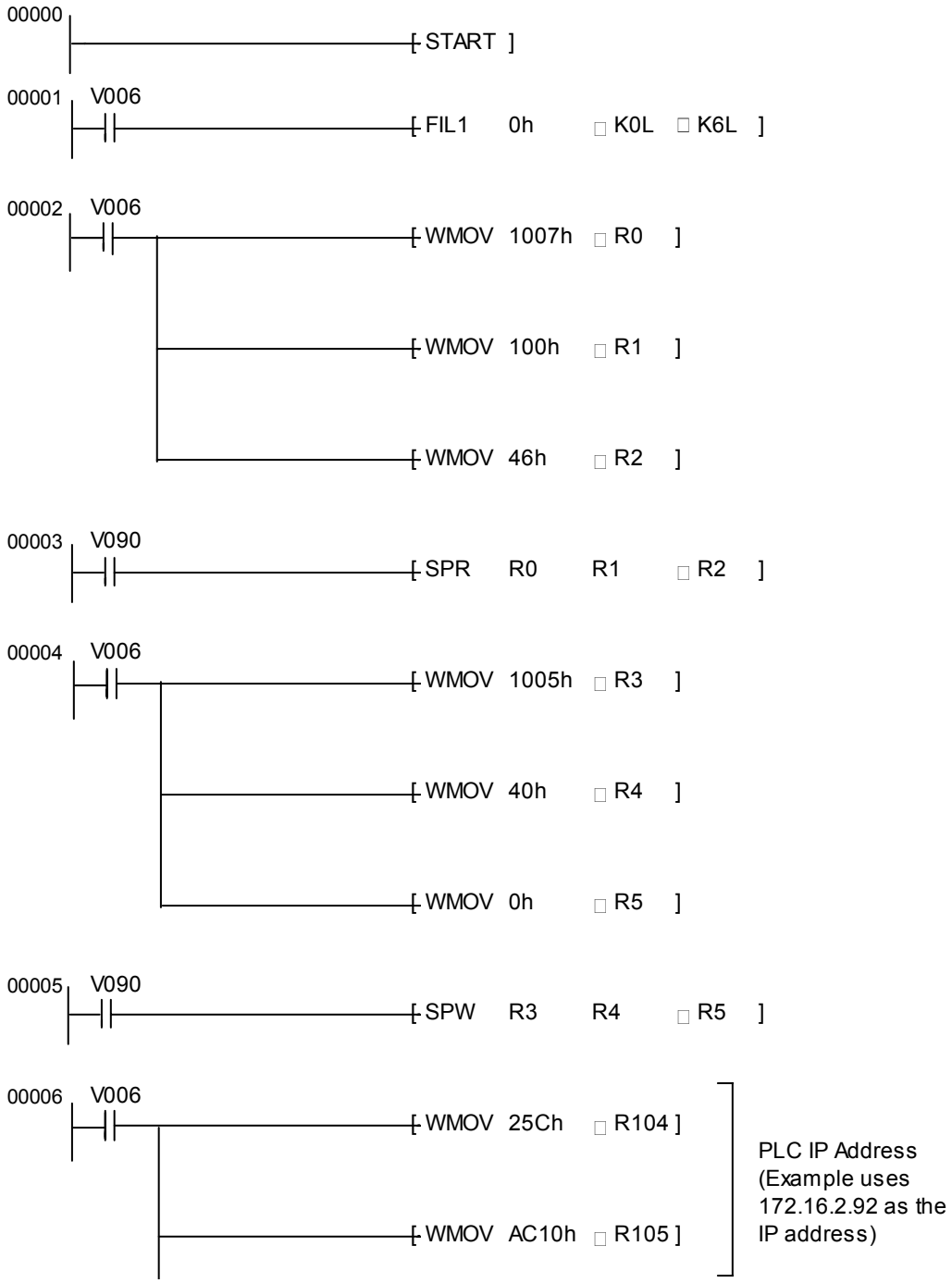
MEMO

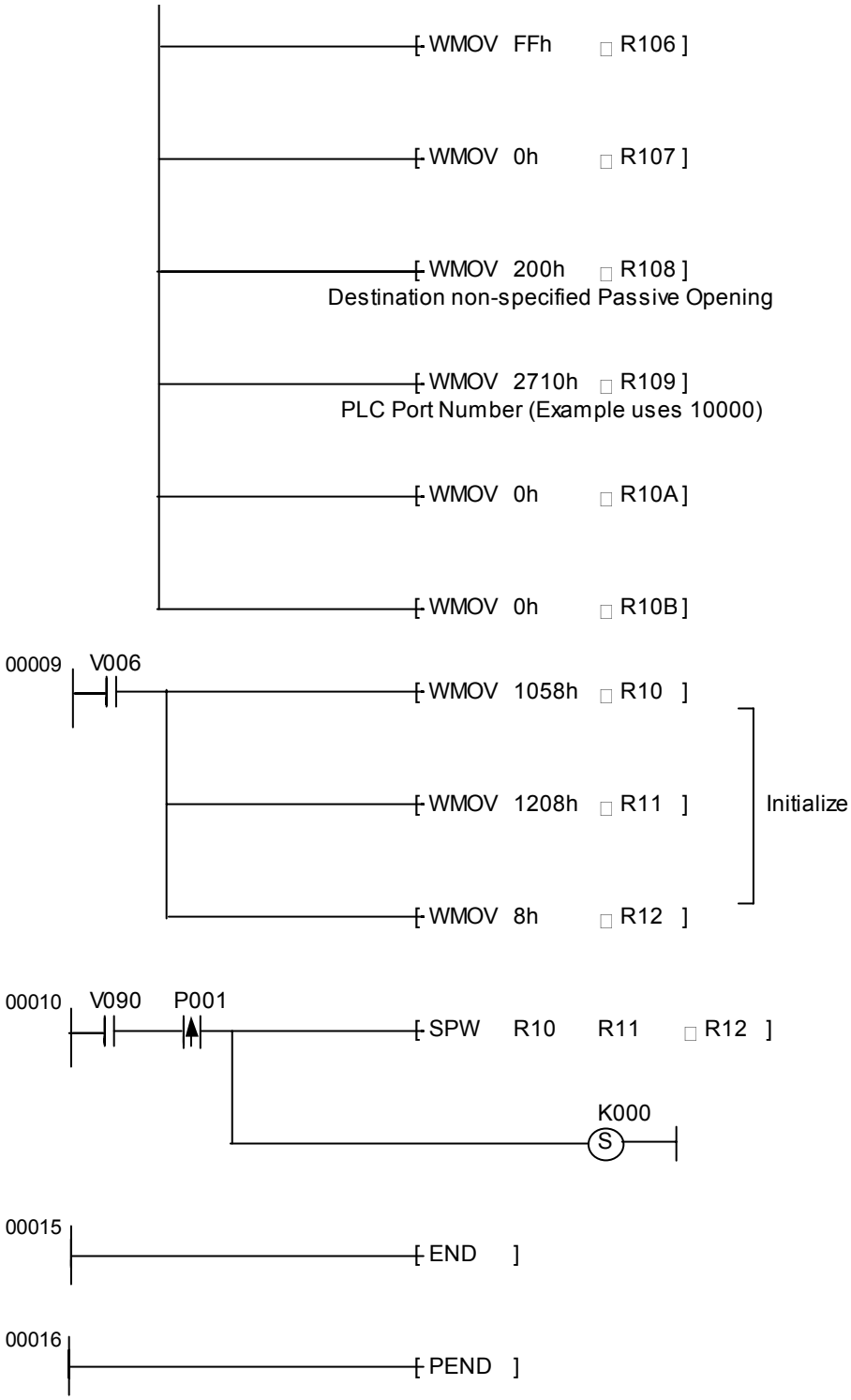
- To speed up data communication, use consecutive device addresses on the same panel screen.
- The following situations increase the number of times that the device is read, and reduces the data communication speed between the target machine and the PLC:
  - when the number of consecutive addresses exceeds the maximum
  - when an address is designated for division
  - when different device types are used

Device	Max. Consecutive Addresses	Gap Span
Input Relay (X)	256 bits	5 bits
Output Relay (Y)		
Internal Relay (M)		
Keep Relay (K)		
Link Relay (L)		
Special Relay (V)		
Edge Relay (P)		
Timer (T)		
Counter (C)		
Data Register (D)	256 words	5 words
Link Register (R)		
Special Register (S)		
Current Value Register (N)		
File Register (B)		
Exp. Input Relay (EX)		
Exp. Output Relay (EY)		
Exp. Internal Relay (EM)		
Exp. Keep Relay (EK)		
Exp. Link Relay (EL)		
Exp. Special Relay (EV)		
Exp. Edge Relay (EP)		
Exp. Timer (ET)		
Exp. Counter (EC)		
Exp. Special Register (ES)		
Exp. Current Value Register (EN)		
Exp. Setting Value Register (H)		
Exp. Data Register (U)		

4 Sample Ladder

The following ladder program illustrates Pro-face's recommended communication settings for the PLC.

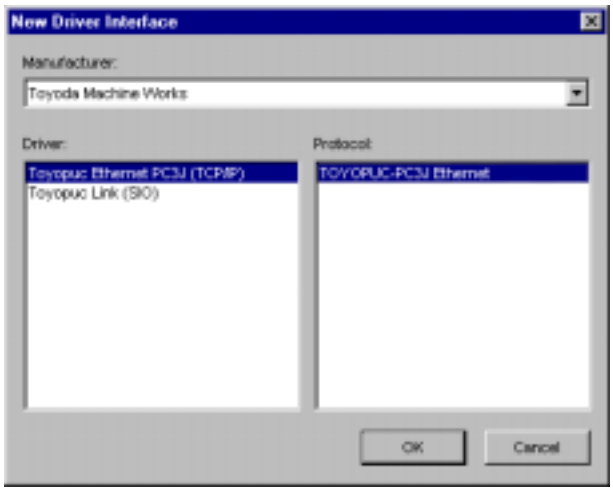



WMOV FFh R106
WMOV 0h R107
WMOV 200h R108
Destination non-specified Passive Opening
WMOV 2710h R109
PLC Port Number (Example uses 10000)
WMOV 0h R10A
WMOV 0h R10B
00009
V006
WMOV 1058h R10
WMOV 1208h R11
WMOV 8h R12
Initialize
00010
V090
P001
SPW R10 R11 R12
K000
S
00015
END
00016
PEND

5 I/O Manager Configuration

The driver and protocol, which enable communication between the target machine and the PLC, depends on the PLC type.

MEMO For information on how to display the [New Driver Interface] dialog box, see the online help.



6 Protocol Configuration

To set up details about the communication process between the target machine and the PLC, use the [Protocol Configuration] dialog box.

MEMO For information on how to display the [Protocol Configuration] dialog box, see the online help.

Destination IP Address
Enter the IP address of the PLC unit.

Destination Port No.
Enter a value to match the PLC's Ethernet port number.

7 Device Address Configuration

To set up a PLC variable in the Variable List, use the Device Address Keypad from the variable properties.
See Section 2 – *Supported Device Addresses*.

MEMO For information on how to display the Device Address Keypad, see the online help.

Device
Lists the PLC's discrete and word device types.

Address
Enter the device address for the PLC variable. The keypad ensures that you enter the correct format for bit and word devices.