1. **Applicable products: Standard V7 drives CIMR-V7AM*) with Ethernet specific software installed (not V74X or V7N). Check V7 monitor U-10 or the PRG # on the V7 nameplate for version 8340 or 8350 software.**

   Note: To order a V7 with Ethernet software, use the following part number format: CIMR-V7AM****1-057.

2. **When using this Kit, it is strongly recommended that no connections be made to the V7 drive's DC Bus terminals (+1 and -) on models CIMR-V7AMxxxx1, where xxxx is 25P5, 27P5, 45P5, or 47P5. A connection for a DC reactor (+1 to +2) or braking resistor (B1 to B2) is allowed.**

3. **Unpack the V7 EtherNet/IP Option Kit and verify that all components are present and undamaged.**
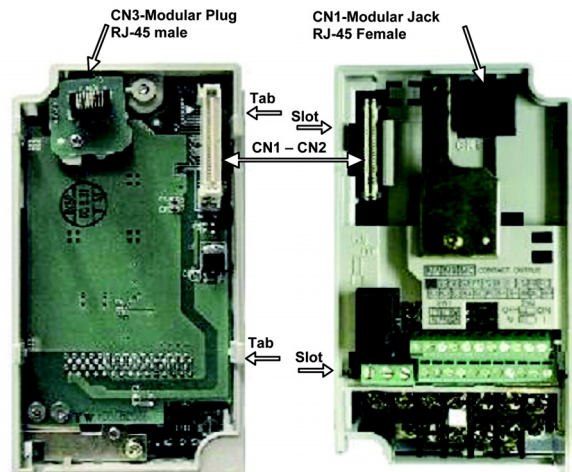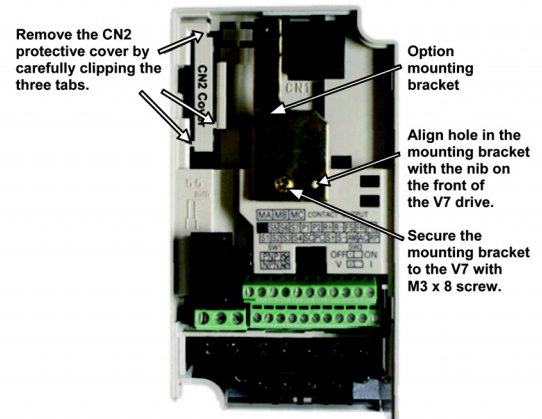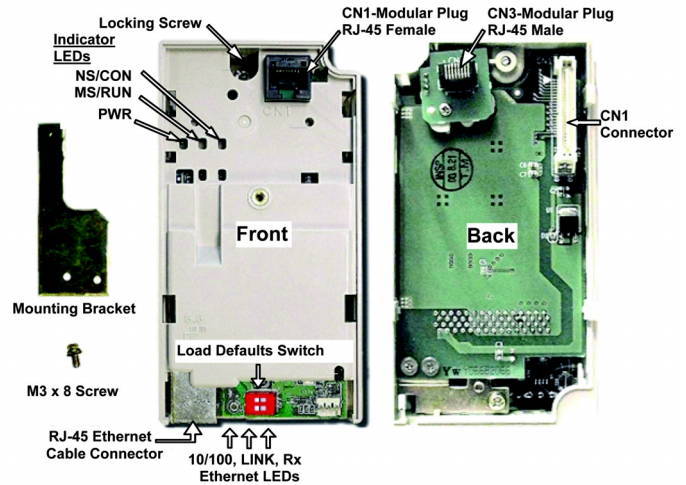
CM093 EtherNet/IP Option Kit Parts	Qty.
V7 EtherNet/IP Option Kit CM093	1
Option Mounting Bracket	1
Mounting Bracket Screw (M3 x 8)	1
Ferrite (Power and Motor Leads)	2
Ferrite (Ethernet Cable)	1
Cable Ties	3
Installation Guide (IG.V7.26)	1

4. **Connect power to the V7 and verify that it functions correctly.** This includes running the V7 from the operator keypad. Refer to the *V7 Technical Manual*, TM.V7.01, for information on connecting and operating the V7 drive.

5. **Remove power from the V7 and wait for the charge lamp to be completely extinguished.** Wait at least five additional minutes for the V7 to be completely discharged. Measure the DC bus voltage and verify that it is at a safe level.

> ### ⚠ WARNING
> Dangerous voltages in excess of 400VDC (230V drives) or 800VDC (460V drives) are present at the DC bus terminals of the drive.

6. **Remove the operator keypad and V7 drive cover.**

   a. Remove the terminal cover by removing the retaining screw and lifting out the cover.

   b. Remove the operator keypad.

7. **Remove the CN2 cover from the V7 terminal housing.** Carefully snip the 3 tabs connecting the CN2 cover on the V7 housing and remove the cover.

8. **Attach the Mounting Bracket.** Align the mounting bracket as shown in the figure to the right. Secure the mounting bracket to the V7 drive's housing using the M3 x 8 screw.

9. **Wire the V7 drive I/O terminals** prior to mounting the V7 EtherNet/IP Option Kit as the option will obscure the power and control terminals when mounted.

10. **Mount the V7 EtherNet/IP Option Kit on the V7 drive.**

   a. Do NOT connect a ground wire to the screw on the back of the option kit.

   b. Align the CN1 connector on the back of the option with its mating CN2 connector on the front of the V7 drive.

   c. Simultaneously align connector CN3 (male RJ-45) on the back of the option with connector CN1 (female RJ-45) on the front of the V7 drive.

   d. Align the tabs on the option with their corresponding slots on the front of the V7 drive.

   e. Press the option and the V7 drive together until the tabs lock into their associated slots.

   f. Secure the option to the V7 drive by tightening the locking screw at the top-center of the option.

   g. Reinstall the operator keypad and all V7 covers.

11. Diagnostic LED power up test sequence

A power-up test is performed each time the V7 drive is powered up after the initial boot sequence. The initial boot sequence may take several seconds. When this sequence is complete, the LEDs will assume normal conditions.

Seq	MS/RUN	NS/CON	Time
1	GREEN	OFF	250ms
2	RED	OFF	250ms
3	GREEN	OFF	250ms
4	GREEN	GREEN	250ms
5	GREEN	RED	250ms
6	GREEN	OFF	

The *EtherNet/IP Option Kit* is successfully initialized after the LEDs have completed the above sequence.

12. LED descriptions

The *EtherNet/IP Option Kit* LED status after the power-up sequence is described below. Please wait at least five seconds for the loading process to complete before verifying the status of the LEDs.

Seq	MS/RUN
MS/RUN	**GREEN – Card Functioning Normally** GREEN BLINK – Standby/Initializing (500ms cycle) RED BLINK – Minor Fault (500ms cycle) RED – Major Fault GREEN/RED BLINK – Module Test (500ms cycle)
NS/CON	**GREEN – Connected** **GREEN BLINK – Waiting for Connections (500ms cycle)** RED BLINK – Connection Timeout (500ms cycle) RED – Duplicate IP Address GREEN/RED BLINK – Network Test (500ms cycle)
10/100	GREEN – 100Mbs Connection Speed
LINK	**GREEN – Link Established**
Rx	GREEN – Message Being Received
PWR	**GREEN – Appropriate Power Supplied to Card**

13. Connect to the *V7 EtherNet/IP Option Kit*

Note: It is strongly recommended that underlined shielded CAT-5 cable be used.

a. Connect to the Ethernet network.

1. **Direct connection:** To connect directly to the *V7 EtherNet/IP Option Kit*, plug one end of a shielded CAT-5 **crossover** cable into the RJ-45 socket on the *V7 EtherNet/IP Option Kit*. Connect the other end to the RJ-45 Ethernet socket on the configuration device, typically a controller, laptop or other PC.

2. **Connection through hub or switch:** To connect through a switch, hub or router, connect *V7 EtherNet/IP Option Kit* to the switch, hub or router using a standard shielded CAT-5 patch cable.

b. Loop the CAT-5 Ethernet cable through the provided ferrite (Intermark RFC-13) and connect the ferrite as close to the RJ-45 connection as possible. Secure the ferrite to the Ethernet cable with the provided cable tie. If the ferrite cannot be mounted in your installation please contact Yaskawa for application assistance. See the figure in the lower right corner of this page.

c. Attach the provided ferrites to the V7 drive motor and power leads as close to the V7 drive terminals as possible (typically within 1 foot). Secure the ferrites to the motor and power leads with the provided cable ties. See the figure to the right.

Indicator LEDs

NS/CON
MS/RUN
PWR

Front

⇧⇧⇧
10/100, LINK, Rx
Ethernet LEDs
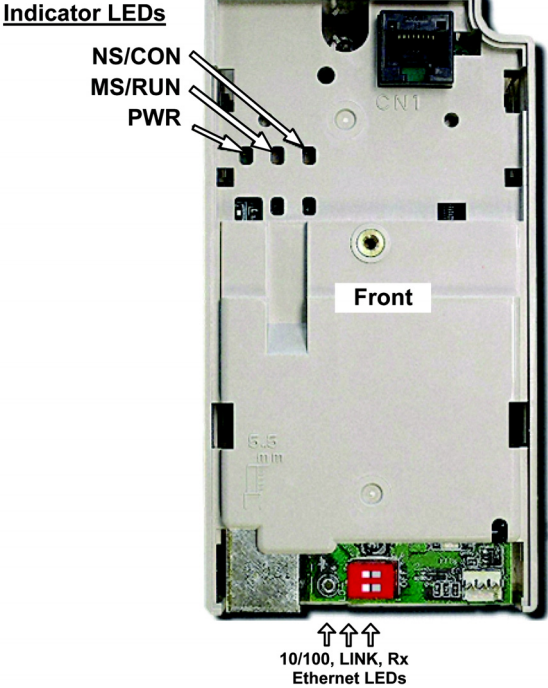
Successful Initialization:

The *V7 EtherNet/IP Option Kit* hardware is installed and operating correctly with the LEDs in the states shown in **bold text** in the "LED Descriptions" table. The LINK LED represents the status of the physical connection to the network and is not indicative of any card state.

Ferrites around power and motor leads

Ferrite around looped CAT5 Ethernet cable
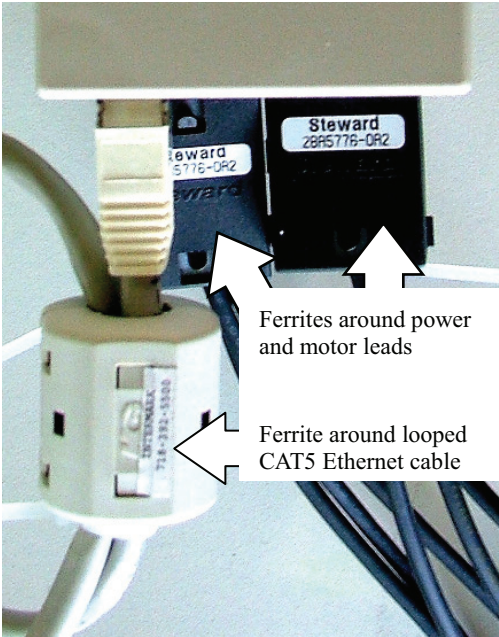
Application of Ferrites:

The *V7 EtherNet/IP Option Kit* includes 3 ferrites which must be mounted to the Ethernet cable, incoming power leads, and motor leads. See Section 13, steps b and c.

14. Configure the EtherNet/IP network

a. The default configuration option for the *EtherNet/IP Option Kit* is DHCP (Dynamic Host Configuration Protocol). Thus there must be a DHCP Server connected to the network in order to have the IP address of the *EtherNet/IP Option Kit* set. For detailed information on how to set up the Rockwell BOOTP/DHCP Server on a PC refer to the appropriate Rockwell document or Yaskawa's Application Note AN.AFD.10.

b. If the network configuration requires that devices have a static IP address, the *EtherNet/IP Option Kit's* configuration can be changed to USER and the appropriate static IP address can be entered via the *EtherNet/IP Option Kit's* web pages as shown below.

Note that the *EtherNet/IP Option Kit* must first have been assigned an IP address via DHCP server before its configuration can be changed.

15. Configuring a PC with a static IP address

a. Select an existing connection or create a new network connection for communication with the *EtherNet/IP Option Kit*.

1. Select **Start** ⇒ **Settings** ⇒ **Network Connections** from the task bar in the Windows OS.

2. Select the network connection to be used.

b. Right click on the network connection and select **Properties** from the drop-down menu.

c. Select **Internet Protocol (TCP/IP)** from the components displayed.

Note: If a TCP/IP selection is not available, it may be installed by selecting Install. Administrator access to the PC and the OS operating system installation CD-ROMs may also be required.

1. Select **Properties**.

Note: If the PC is on a building or office network, disconnect it from that network before proceeding. Record the existing network settings. If the network connection already has an IP address assigned on the EtherNet/IP Local network, ignore the following instructions and just click on Cancel.

2. Select the **Use the following IP address** radio button.

3. Enter the IP address of a vacant IP address on the EtherNet/IP Local Network (**192.168.1.19** in this example).

4. Enter the subnet mask for the EtherNet/IP Local Network (**255.255.255.0** in this example).

5. Check the system network schematic or with your network administrator to ensure that the IP address does not already exist on the network.

6. Once the **IP address** and **Subnet mask** are entered, select **OK**.

Note: It may be necessary to reboot the PC in order for the changes to take effect.

IP address: 192.168.1.19
Subnet mask: 255.255.255.0
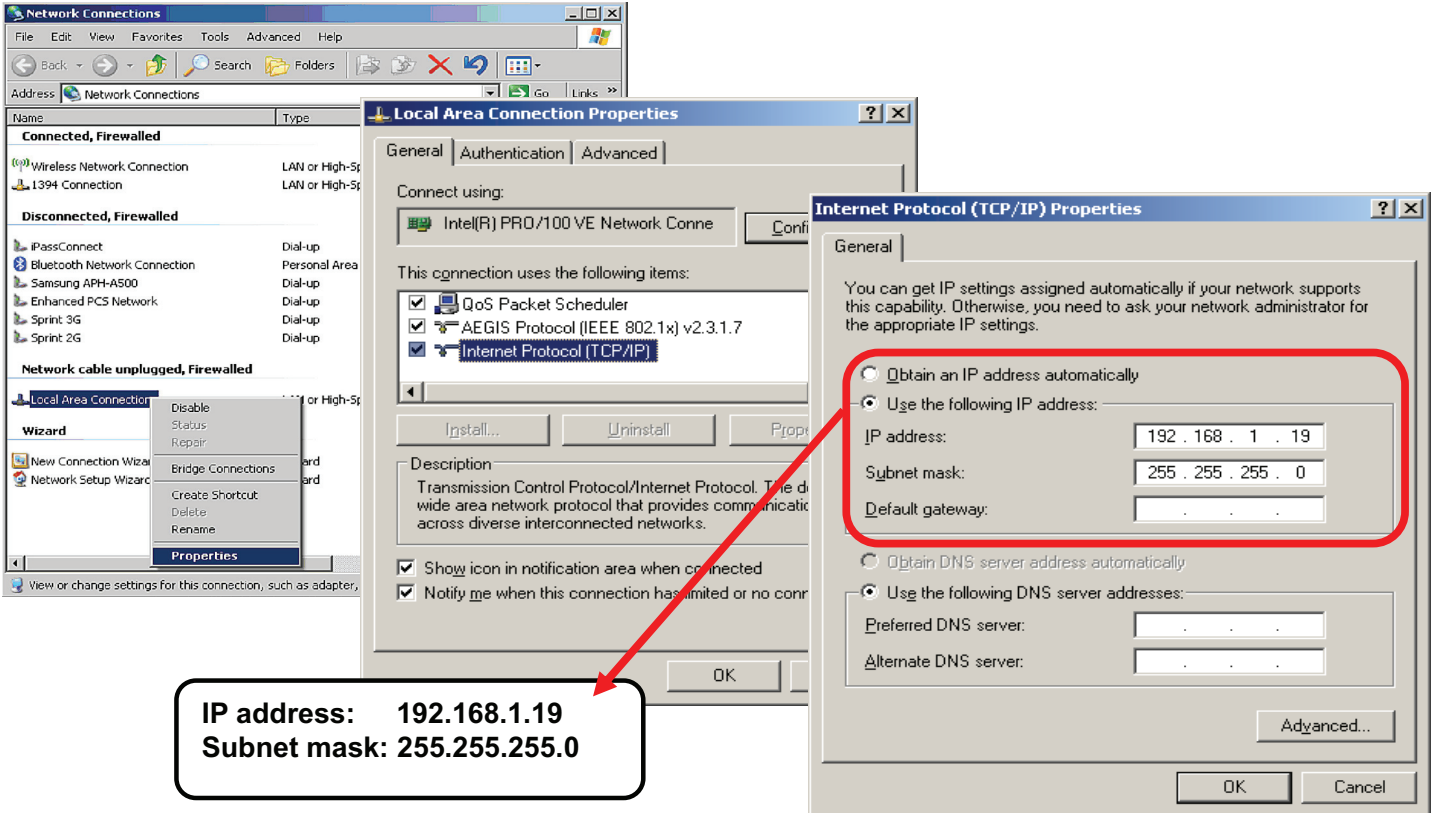
16. Accessing the *EtherNet/IP Option Card* web pages

The browser interface to the *EtherNet/IP Option Kit* can be used for configuring the card or for network and drive information and diagnostics. To access the web pages:

a. Obtain the IP address of the desired drive and enter that IP address in the browser address bar. Hit Enter. The IP address of the desired drive is 192.168.1.20 in this example.

b. The main web page should be displayed.

17. **Configuring the** *EtherNet/IP Option Kit*

   a. Select **Configuration** from the main web page.

   b. After the **Configuration** page has been displayed, select the method in which the *EtherNet/IP Option Kit* will obtain its IP address.

      1. **User:** The *EtherNet/IP Option Kit* will use the network address as entered in the **IP, Subnet** and **Gateway** fields. Check with the system schematic or network administrator to insure that the IP address is valid and unique and that subnet mask and gateway are correct.

         The **USER** radio button is used in this example.

         Enter the new IP address, 192.168.1.20 in this example.

      2. **DHCP**: The *EtherNet/IP Option Kit* will use the network address assigned to it by the DHCP server.

      3. **BOOTP**: The *EtherNet/IP Option Kit* will use the network address assigned to it by the BOOTP server.

   c. Select the **Gateway Usage**. Connectivity to the *EtherNet/IP Option Kit* may be limited or nonfunctional if the gateway usage setting and gateway address do not match the network infrastructure in which it is installed.

      1. **Do not use default gateway in system.** Select this radio button to disable the gateway when there is no external gateway in the system.

      2. **Use default gateway in system.** Select this radio button to enable the gateway when there is an external gateway in the system. Verify and/or update the gateway address as necessary, so that it matches the address of the system gateway.

      3. In all cases the **Gateway** field must contain a valid IP address and must not be blank.

   d. When the new configuration, IP address and subnet mask have been entered, click the **Submit** button.

   e. Verify that the information is correct on the **Submit Results** page.

   f. Power-cycle the drive in order to store the new information on the *EtherNet/IP Option Kit*.

Note: The IP address in the browser address bar will have to be changed to the drive's new IP address and the web page refreshed in order to continue to communicate with the EtherNet/IP Option Kit web pages.
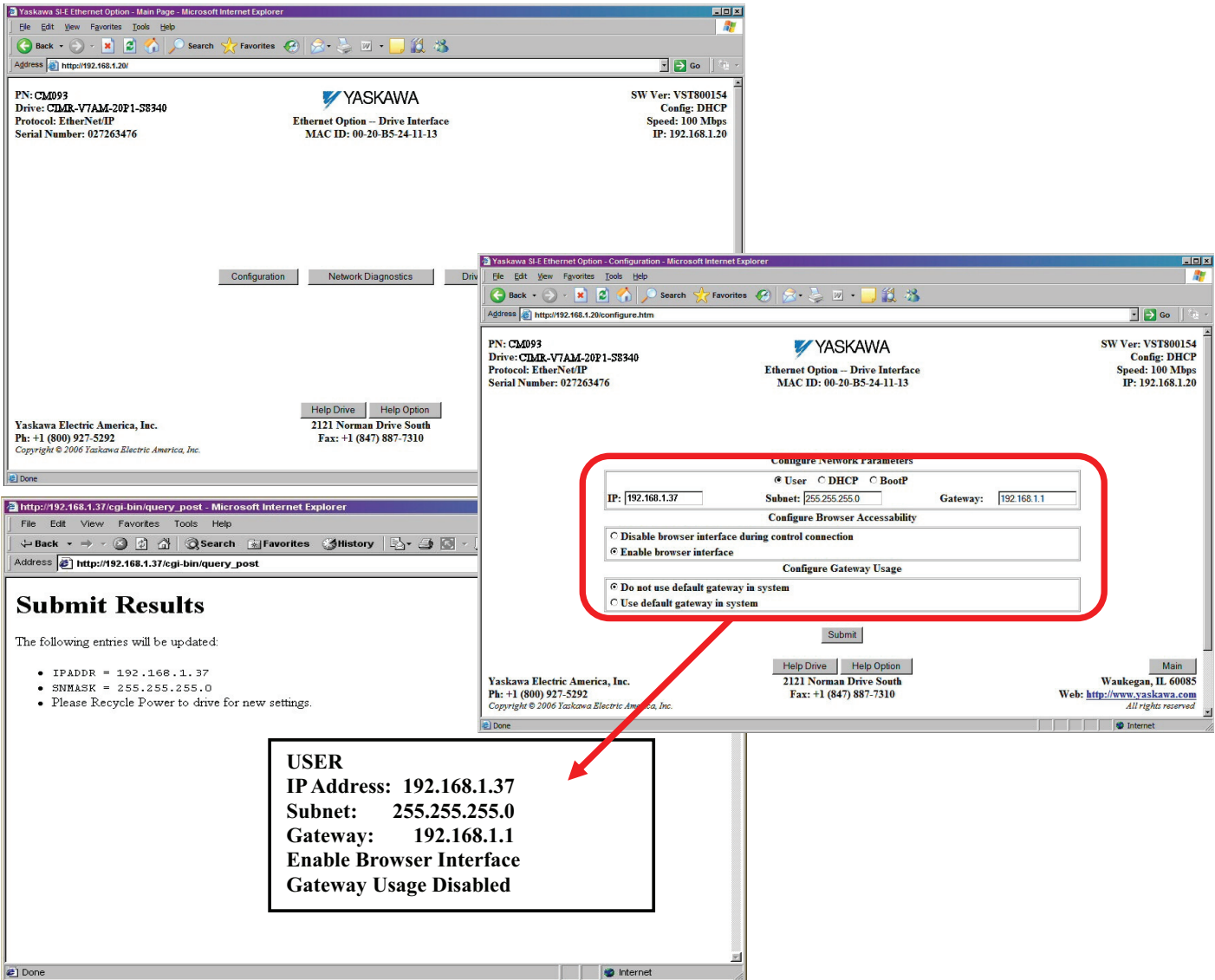
18. **Remove power from the V7 drive** and wait for the charge lamp to be completely extinguished. Wait at least five additional minutes for the V7 to be completely discharged. Measure the DC bus voltage and verify that it is at a safe level.

> ### ⚠ WARNING
>
> Dangerous voltages in excess of 400VDC (230V drives) or 800VDC (460V drives) are present at the DC bus terminals of the drive.

19. **Reinstall the operator keypad and terminal cover.**

20. **Reapply power to the V7 drive.**

21. **Set parameters n003 and n004 to their appropriate values.**

Address	Parameter	Function	Data	Description	Default
103h	n003	Operation Method Selection	0	Operator Keypad	1
			1	Terminal Strip	
			2	Built-in Modbus RTU	
			3	**Option Kit** *(V7 EtherNet/IP Option)*	
104h	n004	Reference Selection	0	Operator Keypad Potentiometer	2
			1	Operator Keypad	
			2	Voltage Reference (0-10VDC)	
			3	Current Reference (4-20mA)	
			4	Current Reference (0-20mA)	
			5	Pulse Train Reference	
			6	Built-in Modbus RTU	
			7	Multi-Function Analog Input (0-10VDC)	
			8	Multi-Function Analog Input (4-20mA)	
			9	**Option Kit** *(V7 EtherNet/IP Option)*	
198h	n152	Display Scaling	0	0.01 Hz	0
			1	0.1 %	
			2-39	RPM (Enter motor poles)	
			40-3999	User Setting	

22. **Resetting the *V7 EtherNet/IP Option Kit* to its defaults**

The factory default settings are as follows:

    Configure Network Parameters: DHCP
    IP Address: 192.168.1.20
    Subnet: 255.255.255.0
    Gateway: 192.168.1.1
    Gateway Usage: Disabled

Symptom: The *V7 EtherNet/IP Option Kit* main web page does not display on the PC web browser screen.

Corrective Action: Check that the PC is set up, properly connected and that an IP address has been assigned to both the node and DHCP server and that they are both on the same local network.

If the web page is still not visible after confirming PC setup, then reset the IP configuration of the *V7 EtherNet/IP Option Kit* to its factory default as follows:

a. Remove power from the V7 drive and wait for the charge lamp to be completely extinguished. Wait at least five additional minutes for the V7 to be completely discharged. Measure the DC bus voltage and verify that it is at a safe level.

> ### ⚠ WARNING
>
> Dangerous voltages in excess of 400VDC (230V drives) or 800VDC (460V drives) are present at the DC bus terminals of the drive.

b. Slide the bottom Load Defaults **(LD)** switch **(SW1)** to the **ON** position.

c. Reapply power to the V7 and wait approximately 10 seconds for the power-up cycle to complete.

> *Note: Additional wait time (approximately two minutes) may be required if utilizing the DHCP feature of this card, and the DHCP server is not available, or it did not respond to the request for an IP address. The V7 EtherNet/IP Option Kit will indicate that the load defaults process is complete when the MS/RUN LED is displaying a steady GREEN status indication after the wait time.*

d. Remove power from the V7 and wait for the charge lamp to be completely extinguished. Wait at least five additional minutes for the V7 to be completely discharged. Measure the DC bus voltage and verify that it is at a safe level. See the warning above.
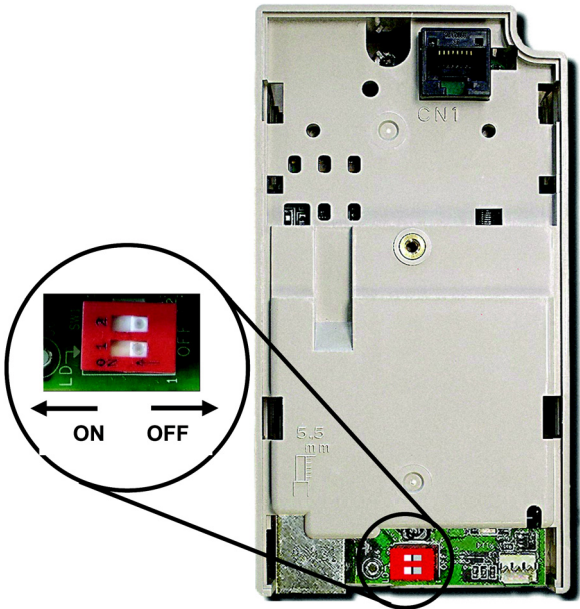
e. Slide the bottom Load Defaults **(LD)** switch **(SW1)** to the **OFF** position.

f. Reapply power to the V7 and wait approximately 10 seconds for the power-up cycle to complete.

23. Notes:

a. **It is strongly recommended that <u>shielded</u> CAT-5 cable be used.** Verify that the shield is continuous to the drive and that it is grounded only at the drive end.

b. Switches implementing IGMP snooping are strongly recommended. When IGMP snooping is used, devices will only receive the multicast packets in which they are interested.

c. To simplify the drive configuration, EDS file can be obtained at **www.yaskawa.com**. Select **Downloads, By Inverter Drives, By Product,** and **Network Comms-Ethernet**. Then select the appropriate EDS file based on the drive series and the latest version from those listed. EDS files for individual drive models are compressed into a single Zip file and need to be unzipped to a temporary directory in order to be installed.

d. The maximum number of connections is 1 for I/O, 4 for Explicit, 2 for DriveWizard.

e. **DriveWizard version 6.1 or later with a custom database is required** for DriveWizard to operate with this option. Install DriveWizard with the "Custom" install option checked and the appropriate databases selected.

24. *V7 EtherNet/IP Option Kit* fault codes

The table of EtherNet/IP fault codes returned by the drive is shown below. See Yaskawa Standard Speed/Torque Output Instance 155 (9Bh) later in the manual for details on where these fault codes can be used. Refer to the V7 manual (TM.V7.01) for drive specific information on the fault returned.

EtherNet/IP Fault Code [hex]	Description	*EtherNet/IP* Fault Code [hex]	Description
0000h	None	5300h	Operator Disconnected (OPA)
2200h	Inverter Overload (OL2)	5300h	Fxx Errors (01,02,03,05,09,10,11)
2220h	Motor Overload (OL1)	7500h	*EtherNet/IP* Communication Error (BUS)
2221h	Overtorque Detection 1 (OL3)	8321h	Undertorque Detection 1 (UL3)
2300h	Overcurrent (OC)	9000h	External Fault on Terminal S3 (EF3)
3210h	DC Bus Overvoltage (OV)	9000h	External Fault on Terminal S4 (EF4)
3220h	DC Bus Undervoltage (UV1)	9000h	External Fault on Terminal S5 (EF5)
4200h	Heatsink Over-temperature (OH)	9000h	External Fault on Terminal S6 (EF6)
4210h	Heatsink Maximum Temperature (OH1)	9000h	External Fault on Terminal S7 (EF7)
4300h	Motor Overheat 1 (OH3)	9000h	External Fault Through Option Card (EF0)
5110h	Control Power Undervoltage (UV2)	–	–

V7 EtherNet/IP Option Kit Supported Class Structure

01 – Identity Object	06 – Connection Manager Object	2A – AC Drive Object	F5 – TCP/IP Object
02 – Message Router Object	28 – Motor Object	64 – Yaskawa Command Object	F6 – Ethernet Link Object
04 – Assembly Object	29 – Control Supervisor Object	65 – Yaskawa Status Object	

Supported Output Instances for Assembly Object Class 04

♦ Basic Speed Control Output Instance 20 (14h)

Output	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Instance	0h	–	–	–	–	–	Fault Reset	–	Run Forward
20 (14h)	1h	–							
	2h	Speed Reference (Low Byte) [Scaled by parameter n152]							
	3h	Speed Reference (High Byte) [Scaled by parameter n152]							

♦ Extended Speed Control Output Instance 21 (15h)

Output	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Instance	0h	–	Network Speed Reference	Network Run Command	–	–	Fault Reset	Run Reverse	Run Forward
21 (15h)	1h	–							
	2h	Speed Reference (Low Byte) [Scaled by parameter n152]							
	3h	Speed Reference (High Byte) [Scaled by parameter n152]							

♦ Speed and Torque Control Output Instance 22 (16h)

Output	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Instance	0h	–	–	–	–	–	Fault Reset	–	Run Forward
22 (16h)	1h	–							
	2h	Speed Reference (Low Byte) [Scaled by parameter n152]							
	3h	Speed Reference (High Byte) [Scaled by parameter n152]							
	4h	Reserved							
	5h	Reserved							

♦ Extended Speed and Torque Control Output Instance 23 (17h)

Output	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Instance	0h	–	Network Reference	Network Run Command	–	–	Fault Reset	Run Reverse	Run Forward
23 (17h)	1h	–							
	2h	Speed Reference (Low Byte) [Scaled by parameter n152]							
	3h	Speed Reference (High Byte) [Scaled by parameter n152]							
	4h	Reserved							
	5h	Reserved							

♦ Yaskawa Standard Speed/Torque Control Output Instance 101 (65h)

Output	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Instance	0h	–	Terminal S7	Terminal S6	Terminal S5	Terminal S4	Terminal S3	Run Reverse	Run Forward
	1h	Terminal P2-PC	Terminal P1-PC	Terminal MA-MC	–	–	–	Fault Reset	External Fault
101 (65h)	2h	Speed Reference (Low Byte) [Scaled by parameter n152]							
	3h	Speed Reference (High Byte) [Scaled by parameter n152]							
	4h ~7h	Reserved							

♦ **Yaskawa Extended Speed/Torque Control Output Instance 115 (73h)**

Output	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Instance	0h	–	Terminal S7	Terminal S6	Terminal S5	Terminal S4	Terminal S3	Run Reverse	Run Forward
	1h	Terminal P2-PC	Terminal P1-PC	Terminal MA-MC	–	–	–	Fault Reset	External Fault
115 (73h)	2h	Speed Reference (Low Byte) [Scaled by parameter n152]							
	3h	Speed Reference (High Byte) [Scaled by parameter n152]							
	4h ~ Fh	Reserved							
	10h	Digital Output Terminal MA~MC (Low Byte)							
	11h	Digital Output Terminal P1-PC (High Byte)							
	12h ~ 13h	Reserved							
	14h ~ 15h	Network Control (bit 0: Network Speed Reference, bit 1: Network Run Command)							
	16h ~ 27h	Reserved							

Supported Input Instances for Assembly Object Class 04

♦ **Basic Speed Control Input Instance 70 (46h)**

Input	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Instance	0h	–	–	–	–	–	Running Forward	–	Fault
70 (46h)	1h	Reserved							
	2h	Output Frequency (Low Byte) [Scaled by parameter n152] [U-02]							
	3h	Output Frequency (High Byte) [Scaled by parameter n152] [U-02]							

♦ **Extended Speed Control Input Instance 71 (47h)**

Input	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Instance	0h	Speed Agree	Net Reference	Net Run/Stop	Drive Ready	Running Reverse	Running Forward	Alarm	Fault
71 (47h)	1h	Reserved							
	2h	Output Frequency (Low Byte) [Scaled by parameter n152] [U-02]							
	3h	Output Frequency (High Byte) [Scaled by parameter n152] [U-02]							

♦ **Speed and Torque Control Input Instance 72 (48h)**

Input	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Instance	0h	–	–	–	–	–	Running Forward	–	Fault
72 (48h)	1h	Reserved							
	2h	Output Frequency (Low Byte) [Scaled by parameter n152] [U-02]							
	3h	Output Frequency (High Byte) [Scaled by parameter n152] [U-02]							
	4h	Motor Torque (Low Byte) [0.1%] [U-08] [Available in OLV control mode only (n002 = 1)]							
	5h	Motor Torque (High Byte) [0.1%] [U-08] [Available in OLV control mode only (n002 = 1)]							

♦ **Extended Speed and Torque Control Input Instance 73 (49h)**

Input	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Instance	0h	Speed Agree	Net Reference	Net Run/Stop	Drive Ready	Running Reverse	Running Forward	Alarm	Fault
73 (49h)	1h	Reserved							
	2h	Output Frequency (Low Byte) [Scaled by parameter n152] [U-02]							
	3h	Output Frequency (High Byte) [Scaled by parameter n152] [U-02]							
	4h	Motor Torque (Low Byte) [0.1%] [U-08] [Available in OLV control mode only (n002 = 1)]							
	5h	Motor Torque (High Byte) [0.1%] [U-08] [Available in OLV control mode only (n002 = 1)]							

♦ **Yaskawa Standard Speed/Torque Input Instance 151 (97h)**

Input	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Instance	0h	Fault	Alarm	Drive Ready	Speed Agree	Fault Reset Active	Running Reverse	–	Running Forward
	1h	–	–	Terminal P2-PC	Terminal P1-PC	Terminal MA~MC	Local Mode	Undervoltage	OPE Error
151 (97h)	2h	Output Frequency (Low Byte) [Scaled by parameter n152] [U-02]							
	3h	Output Frequency (High Byte) [Scaled by parameter n152] [U-02]							
	4h	Motor Torque (Low Byte) [0.1%] [U-08] [Available in OLV control mode only (n002 = 1)]							
	5h	Motor Torque (High Byte) [0.1%] [U-08] [Available in OLV control mode only (n002 = 1)]							
	6h	Output Current (Low Byte) [0.1A] [U-03]							
	7h	Output Current (High Byte) [0.1A] [U-03]							

♦ **Yaskawa Extended Speed/Torque Input Instance 155 (9Bh)**

Input	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Instance	0h	Fault	Alarm	Drive Ready	Speed Agree	Fault Reset Active	Running in Rev	–	Running Fwd
	1h		–	Terminal P2-PC	Terminal P1-PC	Terminal MA~MC	Local Mode	Undervoltage	OPE Error
155 (9Bh)	2h	Output Frequency (Low Byte) [Scaled by parameter n152] [U-02]							
	3h	Output Frequency (High Byte) [Scaled by parameter n152] [U-02]							
	4h	Motor Torque (Low Byte) [0.1%] [U-08] [Available in OLV control mode only (n002 = 1)]							
	5h	Motor Torque (High Byte) [0.1%] [U-08] [Available in OLV control mode only (n002 = 1)]							
	6h ~ 7h	Reserved							
	8h	Frequency Reference (Low Byte) [Scaled by parameter n152] [U-01]							
	9h	Frequency Reference (High Byte) [Scaled by parameter n152] [U-01]							
	Ah	Output Frequency (Low Byte) [Scaled by parameter n152] [U-02]							
	Bh	Output Frequency (High Byte) [Scaled by parameter n152] [U-02]							
	Ch	Output Current (Low Byte) [0.1A] [U-03]							
	Dh	Output Current (High Byte) [0.1A] [U-03]							
	Eh ~ Fh	Reserved							
	10h	Main Circuit DC Voltage (Low Byte) [1VDC] [U-05]							
	11h	Main Circuit DC Voltage (High Byte) [1VDC] [U-05]							
	12h	Error Alarm 1 (Low Byte) [See Page 10 for a list of fault codes]							
	13h	Error Alarm 1 (High Byte) [See Page 10 for a list of fault codes]							
	14h	Error Alarm 2 (Low Byte) [See Page 10 for a list of fault codes]							
	15h	Error Alarm 2 (High Byte) [See Page 10 for a list of fault codes]							
	16h	Error Alarm 3 (Low Byte) [See Page 10 for a list of fault codes]							
	17h	Error Alarm 3 (High Byte) [See Page 10 for a list of fault codes]							
	18h ~ 1Fh	Reserved							
	1Ah	Digital Input Terminal Bit Field (Low Byte) [Terminals S1 ~ S7] [U-06]							
	1Bh	Digital Input Terminal Bit Field (High Byte) [Terminals S1 ~ S7] [U-06]							
	1Ch ~ 27h	Reserved							

♦ **Yaskawa Extended Speed/Torque Input Instance 155 (9Bh)**

(Details for bytes 10 through 23, Error Alarm Signals 1, 2, and 3)

Bytes 12 (Low) and 13 (High) - Error Alarm Signal 1		Bytes 14 (Low) and 15 (High) - Error Alarm Signal 2		Bytes 16 (Low) and 17 (High) - Error Alarm Signal 3	
Bit	**Fault**	**Bit**	**Fault**	**Bit**	**Fault**
0h	PUF DC Bus Fuse Open	0h	EF3 External Fault - Terminal S3	0h	CE Modbus Communication Error
1h	UV1 DC Bus Undervoltage	1h	EF4 External Fault - Terminal S4	1h	BUS Bus Fault
2h	UV2 Control Circuit Undervoltage	2h	EF5 External Fault - Terminal S5	2h	Not Used
3h	UV3 Main Circuit Contactor Answerback Fault	3h	EF6 External Fault - Terminal S6	3h	Not Used
4h	Not Used	4h	EF7 External Fault - Terminal S7	4h	CF Out of Control Fault No Determination of Motor Speed
5h	GF Ground Fault	5h	EF8 External Fault - Terminal S8 (F7U/G7U Only)	5h	SVE Zero Servo Fault (F7U, G7U and G5M in Closed-loop flux vector mode (FVC) only)
6h	OC Overcurrent Fault	6h	FAN Drive Cooling Fan Fault (models with internal cooling fans only)	6h	EF0 External Communications Fault
7h	OV Overvoltage Fault	7h	OS Overspeed Fault	7h	Not Used
8h	OH Heatsink Over temperature Fault	8h	DEV Speed Deviation Fault	8h	Not Used
9h	OH1 Drive Overheat Fault	9h	PGO PG Open, Encoder (Pulse Generator open circuit)	9h	Not Used
Ah	OL1 Motor Overload Fault	Ah	PF Input Phase Loss Fault	Ah	Not Used
Bh	OL2 Drive Overload Fault	Bh	LF Output Phase Loss	Bh	EF9 External Fault - Terminal S9 (G7U)
Ch	OL3 Overtorque Fault 1 (L6-02)	Ch	Not Used	Ch	EF10 External Fault - Terminal S10 (G7U)
Dh	OL4 Overtorque Fault 2 (L6-05)	Dh	OPR Operator Disconnected	Dh	EF11 External Fault - Terminal S11 (G7U)
Eh	RR Dynamic Braking Transistor Failure	Eh	ERR Eprom R/W Error	Eh	EF12 External Fault - Terminal S12 (G7U)
Fh	RH Dynamic Braking Resistor Overheat	Fh	Not Used	Fh	CPF Control Circuit Fault/Peripheral Fault

Copies of this Installation Guide along with all technical manuals in ".pdf" format and support files may be obtained from either the CD supplied with the V7 drive or from www.yaskawa.com. Printed copies of any Yaskawa manual may be obtained by contacting the nearest Yaskawa office. Information on MODBUS TCP/IP may be obtained from www.odva.org.

Reference documents:

V7 Technical Manual – TM.V7.01

V7 EtherNet/IP Technical Manual – TM.V7.26

Application Note – Using the Yaskawa AC Drive "EtherNet/IP" Option with Controllogix / Compactlogix Programmable Controllers – AN.AFD.09

Application Note – Commissioning the Yaskawa Drive EtherNet/IP Option with the Rockwell BOOTP/DHCP Server – AN.AFD.10

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