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# YRC 1000 Ethernet IP Device Setup – SMC EX600

Feb 28, 2023 Yaskawa America, Inc. Motoman Robotics Division

#### **YRC EtherNet IP Device Setup**

Assumptions

- Robot IP address is setup (192.168.1.31) for Lan2
- Robot Ethernet/IP CPU board is enabled (Yaskawa Mode)



## **YRC EtherNet IP Device Setup**

- Define device attributes
- Add device to device list
- Add device to scan list
- I/O allocation
- Set device IP address
- Verify hardware connection
- Verify device communication
- Test I/O
- Files
- Device Communication Status



## YRC ethernet IP Device Setup – Define Device

- See device manuals for information
  - EDS contains this information
- Required information
  - Input instance
  - Input size
  - Output instance
  - Output size
  - Configuration Instance
  - Configuration Size
- Additional Information
  - Manufacturer ID
  - Device ID
  - Revision

What is an assembly instance? An assembly instance is a group of I/O and configuration data.

There are 3 types of assembly instances

- Input
- Output
- Configuration

For example, A Yaskawa V1000 drive has many Output assembly instances.

- Output Instance 20 basic speed control
- Output Instance 21 extended speed control
- Output Instance 22 speed and torque control

#### Add device to device list – SMCEX600 Example

		<b>.</b>		<i>B</i>
SYSTEM FILE CONTROL GROUP APPLICATION OPTION BOARD IO MODULE CMOS MEMORY DATE/TIME OFTION FUNCTION REMOTE PENDANT OPTION FUNCTION	SYSTEM OPTION FUNCTION   FILE CORED DETACHMENT   CAXES DETACHMENT CAXES DETACHME	DETAIL DETAIL DETAIL DETAIL DETAIL DETAIL DETAIL DETAIL USED USED USED USED CLK.) 1 DETAIL DETAIL DETAIL DETAIL DETAIL	SYSTEM SYSTEM FILE FILE EX. MEMORY SD MotoPlus APL. DISPLAY SETUP A REMOTE PENDANT MotoPlus APL. CAR	J Board) : DETAIL TION LIST : DETAIL
Main Manu .Simple Manu I/F Panel Maintenance mode	Main Menu - Simple Menu - I/F Panel - Maintena	nce mode	Main Menu Simple Menu I/F Panel	Maintenance mode

- Reboot controller to maintenance mode
- Select option function
- Select EtherNet/IP (CPU Board)

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• Select device information list – Detail



## YRC ethernet IP Device Setup – Add device to device list

- Select an open space
- Enter the device Information from manufacture
  - Registration name name to appear in scanlist
  - Connection RPI Device Update rate, system dependent. A good starting point is 30ms. More devices is system may require larger rates per device
  - Connection type Exclusive owner
  - Input instance
  - Input size EX600 configuration dependent (1 input module in this example)
  - Output instance
  - Output size
  - Configuration Instance
  - Configuration Size

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A device input instance is the scanner's output Instance.

#### YRC ethernet IP Device Setup – Add device to scanlist

			<b>.</b>
SYSTEM SYSTEM SETUP LANGUAGE CONTROL GROUP APPLICATION OPTION BOARD IO MODULE CMOS MEMORY DATE/TIME OPTION FUNCTION OPTION FUNCTION	SYSTEM OPTION FUNCTION   Image: Stream of the stre	EtherNet/IP(CPU Board) EtherNet/IP(CPU Board) : DETAI EtherNet/IP(CPU Board) : DETAI DEVICE INFORMATION LIST : DETAI DISPLAY SETUP TAR REHOTE PENDANT PAR	
Main Manu Simple Manu I/F Panel Maintenance mode	Main Menu Simple Menu I/F Panel Maintenance mode	Main Menu Simple Menu I/F Panel Maintenance mo	ode

- Reboot controller to maintenance mode
  - Change security mode to Safety Mode
  - Password 55555555555555555
- Select option function
- Select EtherNet/IP (CPU Board)

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• Select EtherNet/Ip (CPU Board)

#### YRC ethernet IP Device Setup – Add device to scan list

SYSTEM FILE EX. MEMORY SD DISPLAY SETUP CA REMOTE PENDANT	EtherNet/IP(CPU Board) EtherNet/IP(CPU Board) IO SIZE(IN/OUT) ADAPTER SCANNER TERMINAL OUTPUT FUNCTION M REGISTER TERMINAL OUTPUT SETTING OC TRIGGER EtherNet/IP Safety SAFETY IO SIZE VIRTUAL COMM	SYSTEM FILE EX. MEMORY SD MotoPius APL. SD DISPLAY SETUP A REMOTE PENDANT C C C C C C C C C C C C C	SCANNER No REGISTRATION NAME IP 01*Op-Station 19 03 04 05 06 07 07 08 09 10 11 12 13	SYSTEM FILE EX. MEMORY SD MotoPlus APL. SD DISPLAY SETUP CA REMOTE PENDANT CA	SCANNER No REGISTRATION NAME IP ADD 01#0p=Station 03 MODIFY 04 DELETE (PACK) 05 06 07 08 09 10 11 12 13	SYSTEM FILE EX. MEMORY SD MotoPlus APL. SD DISPLAY SETUP CA REMOTE PENDANT CA	SCANNER No REGISTRATION 0140p-Station 02 WeldTool 03 04 05 06 07 08 09 10 11 12 13	NAME IP ADDRESS IN /OUT OC COMMENT 192.168. 1. 76 4 4 - Op-Station_1 0. 0. 0. 0 2 4 - SMC EX600 Valve
Main Menu Simpl	e Menu I/F Panel Maintenance mo	Main Menu Simple	Menu I/F Panel Maint	Main Menu Simpl	e Menu   I/F Panel   Maintenand	Main Menu Simpli	e Menu I/F Panel	Maintenance mode

- Select scanner
- Select scanner slot for device (1-16)
- Select Insert
- Pick device from device list
- Set Ip Address for device (and quick connect if functionality is required/available)

## YRC ethernet IP Device Setup – Add device scanlist

- After a device is in the scan list, the device detail can be changed.
  - Change comments for multiple devices with the same configuration (WeldTool1, Weldtool2)
  - Change offset for inputs. This removes status in most cases from the inputs. For example – VIPA 40I/O
- When device detail are change from the device list, an \* appears next to the name. In this case the comment was changed to Sta1WeldTool



## YRC ethernet IP Device Setup – I/O allocation

- Allows assignment of device to specific external inputs / outputs.
- Devices mapping
  - Device1 starting at In/Out 201
  - Device2 starting at In/Out 401
  - Device3 starting at In/Out 601
- Select manual allocation mode
- Select external IO allocation detail
- Initialize input allocation if required
  - Select an ext input address, then Init
    - 20280 starts at general input 201
    - 20530 starts at general input 401
    - 20780 starts at general input 601



## YRC ethernet IP Device Setup – I/O allocation

- Assign Sta1WeldTool Outputs
  - Select dashes in front of Sta1WedITool
  - Select insert
  - Enter 30280 (for general Output 201)
    - Notice there are now two entries for Weld fixture 1. Select the top entry and enter the rest of the inputs. In this case, change the byte to 4.



#### YRC ethernet IP Device Setup – I/O allocation

Flash Reset





#### YRC ethernet IP Device Setup – Set Device IP Address

- SMCEx600 Set Dip Switches
  - Settings1 8 On, 1-7 Off
  - Settings2 1,2,5,6 On 3,4,7,8 Off
- 192.168.1.101
- Plug in ethernet / power cables
- Cycle power on the device



#### Setting and Adjustment

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Settinge1 Setti

#### IP address setting switch

Settingst									
	1	2	3	4	5	6	7	8	P accrete
OFF	ON	OFF	192.108.0.1						
	;	;	:	. :	=	:	:	:	
OFF	OFF	ON	192.108.0.254						
ON	ON	OFF	192.108.1.1						
-	;	;		- ÷	1.1		- ÷	:	:
ON	OFF	ON	192.108.1.254						
ONOFF	ON	DHOP mode							
ONOFF	OFF	Remote Control mode							

HOLD/CLEAR switch: Sets the cutput status when the fieldbus has a communication error or is in idling state.

Settings1	Contract
100	Content
OFF	Output is OFF. (default cetting)
ON	Holds the culput.

This switch can be enabled and disabled by parameter

latings1	Node	Content	Diagnostic size set for the input
2	10000		
OFF	0	input data only (default setting)	Obyte
ON	1	Input data + System diagnosis + Unit diagnosis	4 byte

## **EtherNet IP Device Setup – Verify Hardware Connection**

- Change security mode to management mode
- Under system info, select the network utility
- Enter device IP address in the HOST box
- Press the execute button
- Hardware connection is good when there is an "OK" result
- Verify Ethernet cable to device when "NG" result is displayed.

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MOVE 1	VERSION	RETWORK SERVICE	DATA	EDIT	DISPLAY	UTILITY	222 🕑 📶 ਓ	👌 🔟 🖵 🕀 🕷	
ARC WELDING	Se MONITORING TIME	DI LOGDATA	EX. MEMORY	NETW PING	ORK UTILIT	IY STOP			
VARIABLE B001	CONTROLLER INFORMATION	USER DEFINITION MENU	PARAMETER	HOST TEST	TIMES	192.168.1 4	.101		
	ALARM HISTORY	👰 CPU RESET		1st 2nd 2rd		OK OK			
ROBOT	ALM CONT. CUSTOMIZE	R CODE		4th		OK OK			
SYSTEM INFO	I/O MSG HISTORY	NETWORK UTILITY	SAFETY FUNC.						
	1/F PANEL SETUP	HI-SPEED ETHER.ERR LOG.	PM	£0.					
Main Menu Simple	a Menu   I/F Pane I	WIRE FAILURE	MotoPlus APL.	\$9.					
				ŀ	EXECUTE				
			Main Menu Simpl	le Menu	1/F Panel	<b>b</b> 1	WIRE FAILURE		



Similar to using a PC cmd prompt to ping a device

## **EtherNet IP Device Setup – Verify Device Communication**

- Change security mode to management mode
- Under In/Out, select communication monitor
- Select ST# 15 Ethernet/IP CPU
- Device Scanlist is displayed





## **EtherNet IP Device Setup – Verify Device Communication**

- Communication status is displayed in the STS column
- If NG, curser to the device and press select for diagnostic information

Troubleshooting: Verify device I/O size in setup, ensure power is on all components in the device (both inputs and outputs)



## **EtherNet IP Device Setup – Test I/O**

- From the In/Out menu, select general purpose inputs
- Select an input number and type 201
- Indicator will be solid when input is on

DATA	EDIT	DISPLAY	UTILITY	22	L 🛛 🗞 🔞 L	} 🗄 🚳	Þ
ARC WELDIN ARC WELDIN VARIABLE BOOT IN/OUT IN/OUT ROBOT SYSTEM INFI		RAL PURPOSE OUP #0201 #002 #0203 #002 #0203 #002 #0205 #002 #0206 #002 #0207 #002 #0208 #002	INPUT IG#026 68 60 62 68 64 63 64 64 65 66 66 67 5		44:HEX. #F1-UTC1-FULLEXT #F1-SPARE #F1-SPARE #F1-LTC2-FULLEXT #F1-SPARE #F1-LTC2-FULLEXT #F1-SPARE		
					PAGE		
Main Menu s	imple Menu	1/F Panel	s s	afety g	ward is open		

## **EtherNet IP Device Setup – Test I/O**

- From the In/Out menu, select general purpose outputs
- Select an output number and type 201
- Curser to indicator
- Press pendant interlock and select buttons at the same time in teach mode to turn on/off output.





## **EtherNet IP Device Setup – Files**

- IPNETCFG Stores IP address of the robot
- EIOALLOC Stores I/O allocation
- ETHERIP Stores the scanlist and device info
  - Can not load an ETHERIP to a new controller without having the same size as the file to be loaded.
  - Create a sample device on robot controller that is the same size as the one being loaded.



## **EtherNet IP Device Setup – Device Com Status**

- Terminal output function assigns com status of scanner slots to M registers.
- YAS2.43.00A-00 or later software
- Com fault is on / Com Ok is off



Scanner Slot Number





#### Manual 178651-1CD Section 4.10







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