
Application Note #1195: GPro EX to Fanuc Robot R30iA (R-J3iC) via Ethernet

Introduction

Many Fanuc Robotics controllers have a built-in GE Fanuc Series 90 PLC engine. Using this capability, Pro-face HMIs can be used to communicate to the Robot controller with either serial or Ethernet connections using the GE Series 90 SNPX protocol. Earlier models such as the R-J3iB only allowed SNPX support via RS232.

This document gives details of tested connections to a Fanuc Robot Controller via Ethernet.

Fanuc Robotics provides a HMI Device Setup and Operations Manual and a supplemental HMI Users Manual (MARUIBHMI03031E) which details the addressing and setup of system variables for these Controllers.

Note: In some markets, an optional item which provides an “unlock code” is required to enable the Controller to communicate via Ethernet to an HMI. Check with your local Fanuc Robotics supplier for details and pricing.

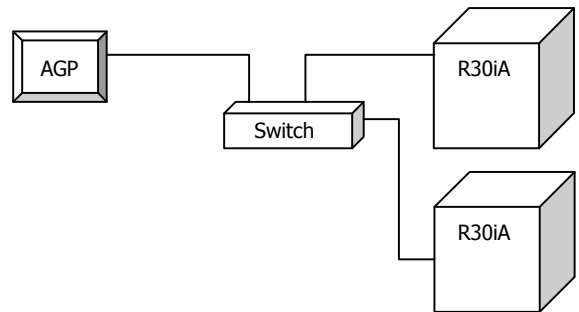
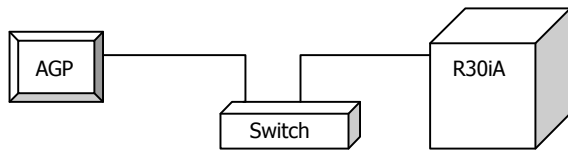
Fanuc Robotics Item #	Description
RTL-R553-HT	HMI Device (SNPX)

Equipment used for testing:

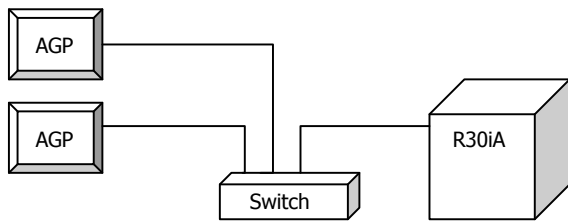
Fanuc Robotics Controller	R30iA (R-J3iC System)
Fanuc Robotics Option #	RTL-R553-HT. HMI Device (SNPX)
Pro-face HMI	AGP3650T (Any GP with Ethernet or WinGP should work.)
AGP Programming Software	GP-PRO-EX V2.10.100 and V2.60.000
Communication Driver	GE Fanuc Automation, Series 90 Ethernet V1.11.02

Note: The above controller is used to power a wide range of Fanuc Robots for different applications and Industries.

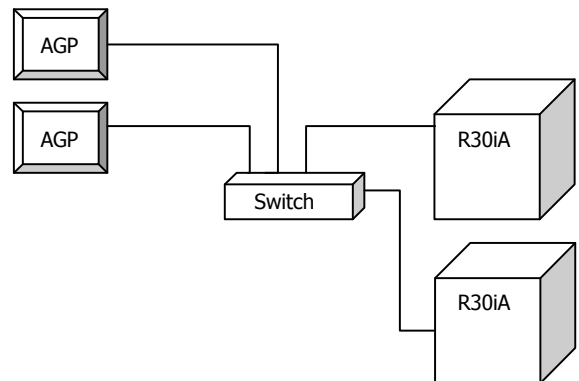
Tested Configurations:



2 x AGP : 1 x R30iA Connection



2 x AGP : 2 x R30iA Connection



Note: The tested configurations do not represent the maximum number of units in a single connection. GP-PRO-EX allows you to configure up to 16 nodes, although this is no guarantee that the response time will be acceptable. The maximum number of Ethernet connections that the R30iA will accept is not known at the time of writing.

Robot Controller Set Up:

The R30iA has two individually configured Ethernet ports. On the controller they are labelled A & B. On the teach pendant they are referred to as #1 and #2. The AGP can connect to either port. The only settings are IP Address and Subnet Mask. The following settings were used for testing..

Robot 1	
Port#1 IP Address:	192.168.0.10
Subnet mask:	255.255.255.0
Robot 2	
Port#1 IP Address:	192.168.0.11
Subnet mask:	255.255.255.0

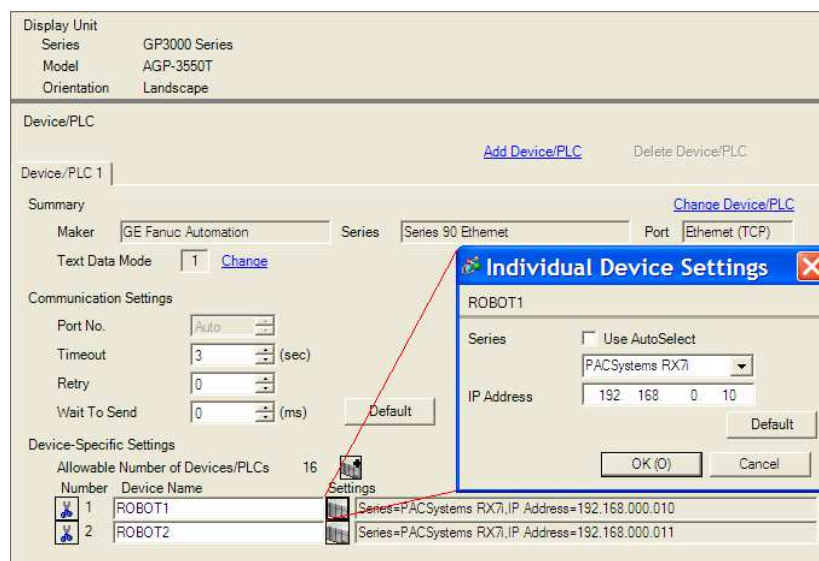
The local host settings are not necessary. However, if you add the AGPs to this list then you can test the Ethernet connection to them by using the Ping command on the teach pendant.

GP-Pro EX Communication Set Up:

Device/PLC Settings in GP-PRO EX

Disabling “Use AutoSelect” in the “Individual Device Settings” window allows you to select the relevant series. Select “PACSystems RX7i” from the list when connecting to the R30iA robot controller. You must also enter the IP address of the controller you wish to connect to.

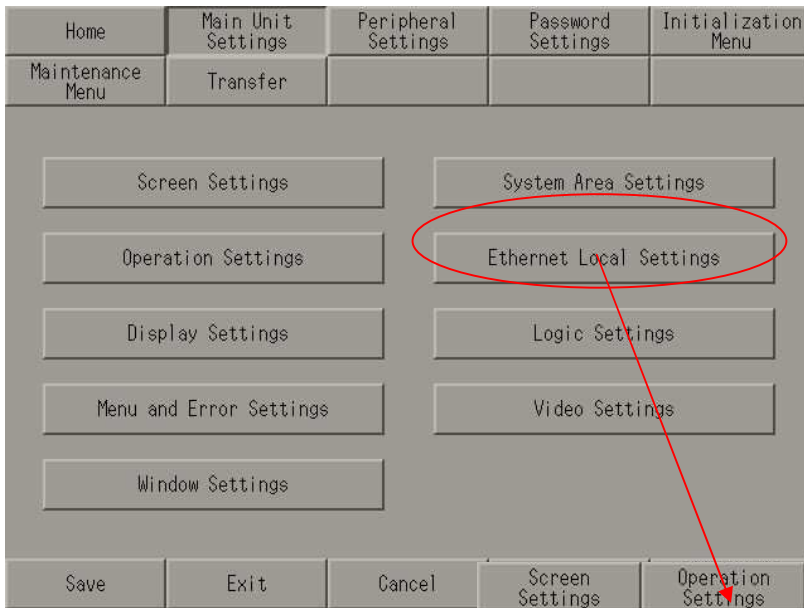
Add more devices to configure more than one Robot controller.



GP Ethernet Communication Set Up:

The Ethernet settings for each AGP screen are set in the offline menus.

To enter offline mode, press the top left hand corner followed by the bottom right hand corner (or vice versa) of the touch screen within 0.5S of each other but not simultaneously. Then select Offline from the menu bar at the bottom of the screen.

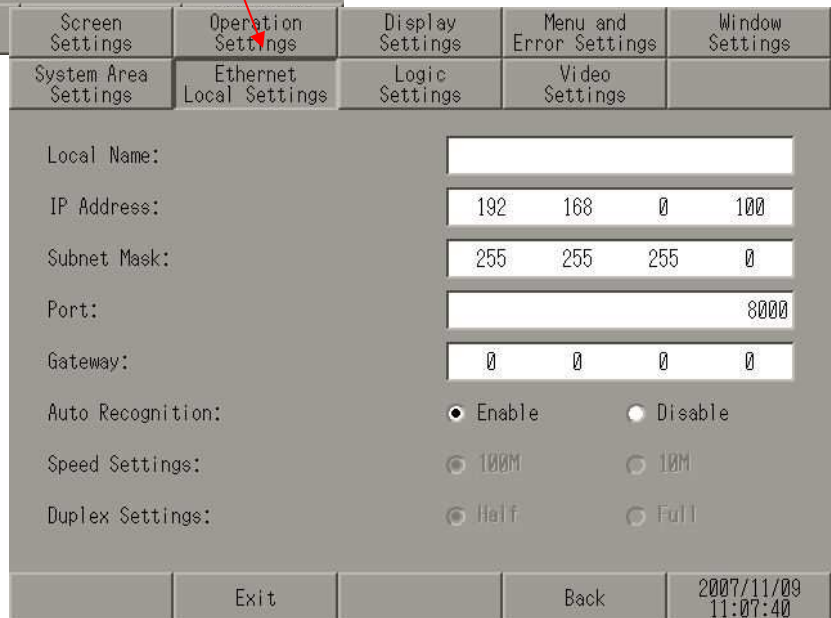


In Offline mode select “Main Unit Settings”, then “Ethernet Local Settings” and Setup the IP address and Subnet Mask.

The settings used for testing were..

AGP 1
IP Address: 192.168.0.100
Subnet mask: 255.255.255.0

AGP 2
IP Address: 192.168.0.24
Subnet mask: 255.255.255.0



Robot Controller Addresses in GPRO-EX:

The robot controller’s data memory can be configured from the teach pendant. It comprises of Internal registers (R) which can be configured as 16 or 32 bit integers or Strings, Inputs (Q) and Outputs (I).

Device	Device Type	Data Types	Action
R_****	Internal Registers	16 Bit Integer, 32 Bit Integer*, String**	Read/Write
I_****	Outputs	Discrete	Read/Write
Q_****	Inputs	Discrete	Read only

Notes:

**** Represents a numeric value

* 32 bit Integer addressing is different in the Robot controller is different to the AGP. The robot uses one R register per 32 bit Integer, whereas the AGP uses 2. Eg. For a block of 5 x 32 bit integers from R200, the following addressing would apply.

Robot Address	AGP Addressing
R_200	R_200
R_201	R_202
R_202	R_204
R_203	R_206
R_204	R_208

** Strings occupy 40 x R registers.

Error Codes:

RHAA083 Socket Error 8[8H]

This error has been observed when using more than one screen to talk to one Robot Controller. If this error occurs:

1. Clear out the Ethernet settings for that controller using the teach pendant.
2. Restart the controller to save the empty Ethernet settings
3. Re-enter the Ethernet settings via the teach pendant
4. Restart the controller to save the new settings.

Alternatively, you can use the second Ethernet port. If you do this make sure that you clear out the configuration on the original port first of all.

For more information on Pro-face and our full line of HMI, Operator Interface and Industrial PC products please visit our web site at www.profaceamerica.com.

For technical support email: support@profaceamerica.com or call: 800.289.9266.

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