

## HMI to IO Modules via Modbus – sample application

### Hardware required for testing

1. HMI 605-S, Make: Brainchild, Modbus master
2. At least one IO Module say IO-8DIO, Make: Brainchild, Modbus slave
3. HMI to PC cable

### Software required

HMI Studio, Version 1.11, Update May3,2007 and later versions  
Application program: HMI\_IO2\_R1.pzm

### IO Module setting:

Dip Switch1: ON, All other dip switches: OFF

That means, address of IO module is set to 1 and default communication settings as follows..

BAUD RATE	9600
DATA BITS	8
PARITY	NONE
STOP BITS	1

### Connection scheme (RS485)



### HMI Side (DB9 Male connector):

1 & 4 shorted  
8 & 9 shorted

## Checking of sample program

1. Download “HMI\_IO2\_R1.pzm” application + firmware from PC to HMI 605 via COM1
2. Connect the communication cable between COM2 of HMI 605 and IO Module
3. Restart HMI and make sure that “Communicating with Modbus PLC on Port 2” message appears in HMI at power up. If any error, then check cable between HMI and IO, Dip switch at IO Module.
4. If you want to change communication settings of the IO module, you can set from the HMI (Screen 1)

## Reference manuals:

UMIOA: <http://www.brainchild.com.tw/bc/images%5CUMIOA.pdf>

## HMI 605-S Modbus driver configuration

(This is already done in sample application program-all the following pages is for user information only)

Software: HMI studio

Open new project with 605-S

Open network configuration

Port: COM2, Protocol: Modbus (Master), Model: Modbus Generic, Address:1

Default values: Inter frame delay: 10, Response time out: 800, Retry count: 3

Port settings: Select Baud rate, parity, data bits, stop bits same as IO Module default settings.

**Network Configuration**

Node address	Com1	Com2	Ethernet	Name	HMI / PLC	Blocks
000	000	-----		Operator Panel	HMI 605	00028

Port:

Protocol:

Model:

Node

Address:  [ 0 to 255 ]

Name:  ( Max 15 )

Inter frame delay:  [ 0 to 3000 ]

Response time out:  [ 10 to 6000 ] ms

Retry count:  [ 0 to 5 ]

Ethernet PLC

IP Address:  . .

PLC Port:  [ 0 to 65535 ]

**Port communication settings**

Baud Rate: 9600

Parity: None

Data Bits: 8

Stop Bits: 1

Ok Cancel

**Network Configuration**

Node address			Name	HMI / PLC	Blocks
Com1	Com2	Ethernet			
000	000	----	Operator Panel	HMI 605	00031
----	001	----	Com2 : Node1	Modbus ( Unit as Master ) ( MODBUS GENERIC )	00037

Port: Com2 Port settings

Protocol: Modbus ( Unit as Master )

Model: MODBUS GENERIC

Node

Address: 01 [ 0 to 255 ]

Name: Com2 : Node1 ( Max 15 )

Inter frame delay: 10 ( 0 to 3000 )

Response time out: 800 ( 10 to 6000 ) ms

Retry count: 3 ( 0 to 5 )

Ethernet PLC

IP Address: . . .

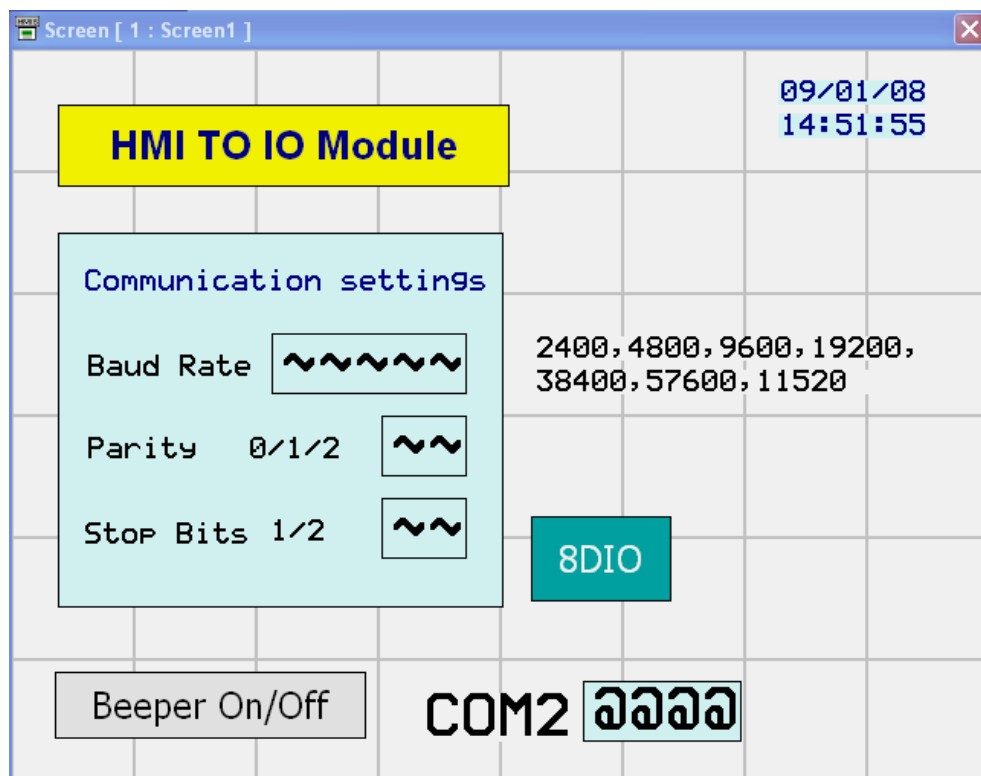
PLC Port: ( 0 to 65535 )

PLC specific settings

Add Delete Change

Close Help

## Sample screens



### How to use IO modules information in HMI ladder?

Please note that HMI ladder program allows only HMI internal memory and it is not possible to access IO module tags directly. So, it requires to “Copy” information between HMI internal memory to IO tags and vice versa. Special “COPY” functions are available which can be used in the global tasks or screen tasks

There are two ways

#### 1. Copy the DI/DO coils to HMI internal memory and vice versa in global tasks/screen tasks

For IO-8DIO module,

Digital input1, DI1 address = 10001,  
 Digital output1, DO1 address = 00017  
 Digital input status = 30002

For ex: Copy 10001 to B101. That means, digital input1 status will be copied to HMI internal memory coil B1. Now, you can use B1 in ladder applications.

Note: You can use Copy function either in global tasks or screen tasks as per your application requirements.

### HMI : Task-lists of Screen [ 2 : 8DIO ]

Screen Preview

**8DIO**
09/01/08  
14:54:23

DI		DI		DO		DO	
10001		10005		00017		00021	
10002		10006		00018		00022	
10003		10007		00019		00023	
10004		10008		00020		00024	

Give DI1 and check status of DO1
Check "While showing"screen task

Back
Next

Select a Task to add

Close
Help

☒ 'Before showing' Tasks

↑  
↓  
✖

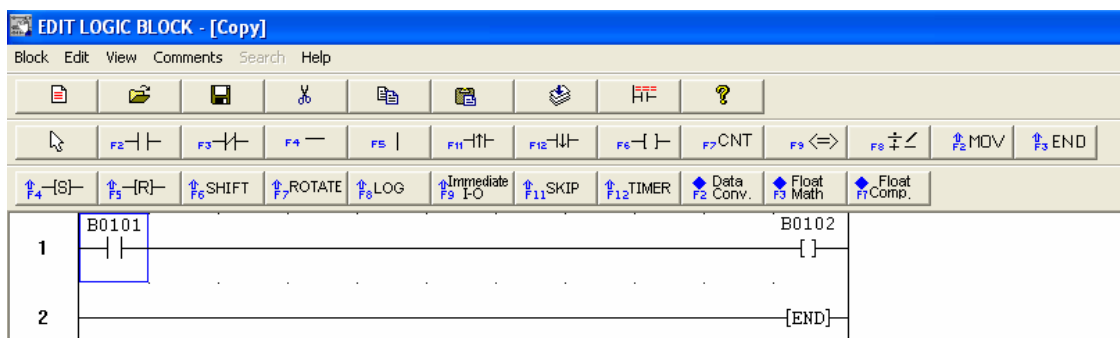
☐ 'While showing' Tasks

Copy Tag 100001 ( COM2 ) to Tag B0101  
Execute PLC Block Copy  
Copy Tag B0102 to Tag 000017 ( COM2 )

←  
→  
✖

☐ 'After hiding' Tasks

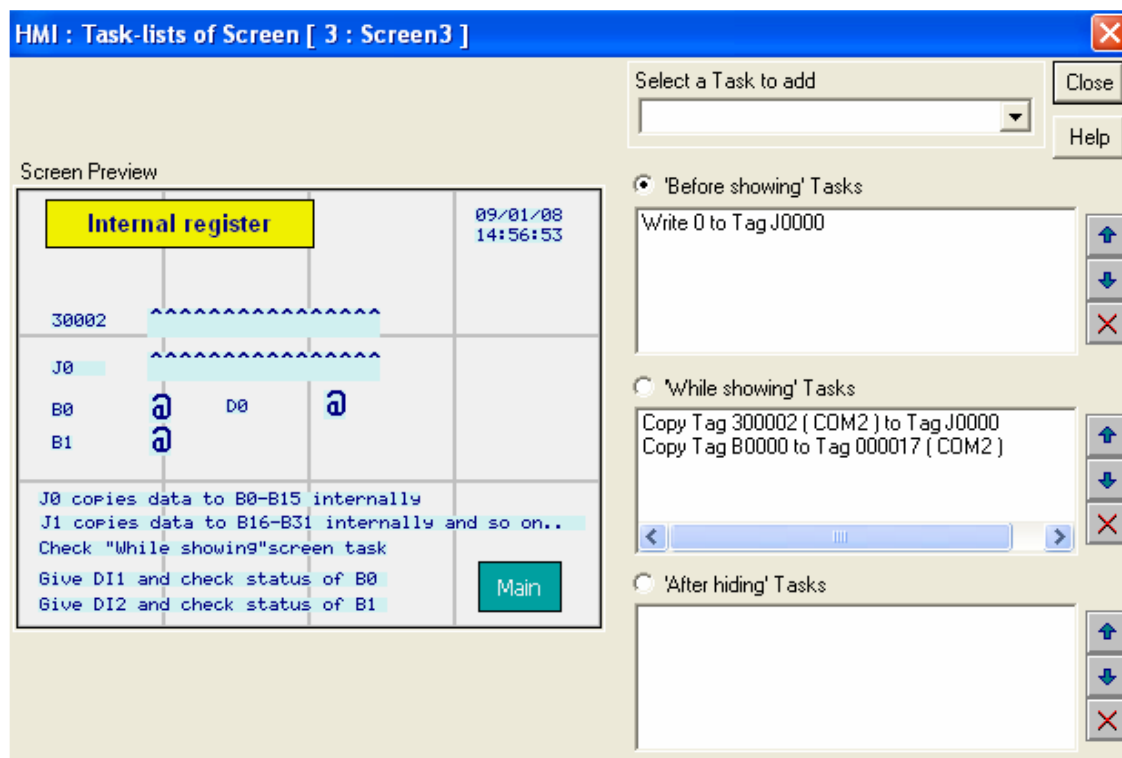
↑  
↓  
✖



## 2. Usage of HMI internal register, J type

Copy Digital input status to HMI internal register J type. Then it will be linked with HMI internal memory coil B type memory internally. Now, you can use B type memory in ladder applications.

For IO-8DIO module, digital input status address = 30002. This register contains information about all the digital inputs



Ex: Copy 30002 to J0, then 16 nos. digital inputs information shall be copied to HMI internal memory B0 to B15. Now you can use HMI internal memory B type in the ladder program.

J0 = B0 to B15

J1 = B16 to B31 and so on..

# BrainChild

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