

M GPI Box for Project 68

M GPI Box for Project 68.....	1
Change History.....	1
General	1
LED Operation	1
Hardware changes	1
Connections.....	2
DIP SWITCHES.....	2
SWITCH1:	2
SWITCH2:	3
SWITCH3:	3
Relay Messages	3
Set Aux[00]	4
Request GPI Status[02] and Send GPI Status[03]	4

Change History

REVISION	CHANGE	REASON
1.00		Initial Release

General

PG51-0031-0100 Firmware release part
IC51-0014-0100 Programmed device
BH51-0014-0100 Binary/Hex file
FW00-0122-0100 Firmware Source Code

The relay box has 64 relays or 8 GPI addresses.

The relay box at startup will wait to be turned on line by the Bus Master. Once turned on line, the relay box will wait 15 seconds for the System Master address to be sent by the bus master before assuming there is no System Master. After this time, the dip switches are used to configure the beginning GPI number.

If the System Master address is provided, the relay box will query the System Master for the relay range it should be using. It will continue to query the System Master every 15 seconds until an answer is provided and is not configured until an answer (ACK or NACK) comes back from the System Master.

If a NACK comes back from the System Master to the request for GPI range then the default relay range is used. This in effect says “I do not have the capability to provide your relay range so use your default”.

LED Operation

The right side of the front panel includes the red data LED light. This light continually flashes on and off at a regular rate (about 1 second intervals) until the unit is “on line” and communicating with the CM6800. Once “on line”, the LED will remain lit. If, for any reason, communication is lost the LED will again flash until communication is re-established.

Hardware changes

In order to implement 485 using pins 1,2 and 7,8 the following changes must be made to the board:

U6:	Lift pins 3 and 4.
Jumper:	U6 pin 3 to U15 pin 1
	U6 pin 4 to U15 pin 9

This change ties the TX485Enable line to the transmitter at U6 and ties the 485DRIVESELECT line to the receiver at U6. The 485DRIVESELECT now doubles as a RX485Enable line.

Connections

Connector P2 is used for connecting to the M protocol bus.

Pin 1	Tx+
Pin 2	Tx-
Pin 7	Rx-
Pin 8	Rx+

Connector P3 is used for diagnostics. This is an EIA 232 port with a DB9 connector.

If Switch 2 dip 10 is up, P3 is then used for diagnostics and is a standard DB9 EIA232 connection. The diagnostic port is set for 19200 N, 8, 1.

DIP SWITCHES

SWITCH1:

1,2,3	4,5,6	7	8	9	10
BAUD1	Begin Relay	1-16 NO	17-32 NO	33 – 48 NO	49-64 NO

where:

BAUD1 = PORT1 Baud rate

DIP 1	DIP 2	DIP 3	BAUD
OFF	OFF	OFF	1200
ON	OFF	OFF	2400
OFF	ON	OFF	4800
ON	ON	OFF	9600
OFF	OFF	ON	19200
ON	OFF	ON	38400
OFF	ON	ON	57600
ON	ON	ON	115200

Begin Relay Range

DIP 4	DIP 5	DIP 6	BEGINNING RELAY	BEGINNING GPI
OFF	OFF	OFF	1	1
ON	OFF	OFF	65	9
OFF	ON	OFF	129	17
ON	ON	OFF	193	25
OFF	OFF	ON	257	33
ON	OFF	ON	321	41
OFF	ON	ON	385	49
ON	ON	ON	449	57

1-16 NO to 49-64 NO:

Normally Closed if ON, Normally Open if OFF.

SWITCH2:

1,2,3,4,5,6,7,8	9	10
ADDR	Not Used	DIAGS_ON

where:

ADDR = local device address of the GPI box 0 – 253 (254 and 255 invalid - default to 253).

DIP 1	DIP 2	DIP 3	DIP 4	DIP 5	DIP 6	DIP 7	DIP 8	ADDRESS
OFF	OFF	OFF	OFF	OFF	OFF	OFF		1
ON	OFF	OFF	OFF	OFF	OFF	OFF		2
OFF	ON	OFF	OFF	OFF	OFF	OFF		3
ON	ON	OFF	OFF	OFF	OFF	OFF		4
OFF	OFF	ON	OFF	OFF	OFF	OFF		5
ON	OFF	ON	OFF	OFF	OFF	OFF		6
OFF	ON	ON	OFF	OFF	OFF	OFF		7
...
ON	ON	OFF	ON	ON	ON	ON	ON	252
OFF	OFF	ON	ON	ON	ON	ON	ON	253
ON	OFF	ON	ON	ON	ON	ON	ON	253
OFF	ON	ON	ON	ON	ON	ON	ON	253
ON	ON	ON	ON	ON	ON	ON	ON	253

Not Used

Means the dips are not used or configured and should be left in the OFF position.

DIAGS_ON:

Diags on port 0 if ON, otherwise nothing on port 0

SWITCH3:

1,2	3	4	5	6	7,8,9,10
Not Used	1-16 MEM	17-32 MEM	33 – 48 MEM	49-64 MEM	Not Connected

where:

Not Used

Means the dips are not used or configured and should be left in the OFF position.

1-16 MEM, 17-32 MEM, 33-48 MEM, 49-64 MEM

If OFF these relays will be initialized on power up, if ON they will remain in the last state.

Not Connected

These dip switches are physically not connected to the processor, leave them in the OFF position.

Relay Messages

The GPI box uses the following M protocol relay messages. The command byte for each message is GPI [06].

- Set Aux [00]
- Clear Aux [01]
- Request GPI Status[02]
- Send GPI Status[03]
- Request GPI Range [10]

Set Aux[00]

The Set Aux command has a time included in the command. The Set Aux command will by default latch the aux, however if the time is non-zero the aux will timeout and clear itself. The time is a word that allows for 0 – 65535 seconds, 0 being a latch forever (or until a Clear Aux command is received). The relay box contains a word that is decremented every 100 milliseconds or 1/10 of a second for each auxiliary. This means that the maximum time a relay can be set for is 6553 seconds ($6553 * 10 \approx 65535$) or 109 minutes and 21 seconds. Any value 6553 or larger in the command will be set equal to 6553.5 seconds.

Request GPI Status[02] and Send GPI Status[03]

It is possible to request the status of a GPI from the GPI Box. When a Request GPI Status command is received, a Send GPI Status command will be issued to the requesting device.

The Request GPI Status[02] command is only possible if we know the status of the relays. For this reason, if the dip switches indicate that relay memory is ON for any group of relays, we cannot know for sure the state of the relays. The software has no way of reading which relays have retained their memory when the power came back on. When the relay memory is OFF, all relays are initialized to a known state (OFF).

If relay memory is ON, the Send GPI Status[03] command will always indicate the relays are OFF.

A Send GPI Status command is sent any time the status of a relay changes as an ALL CALL message.