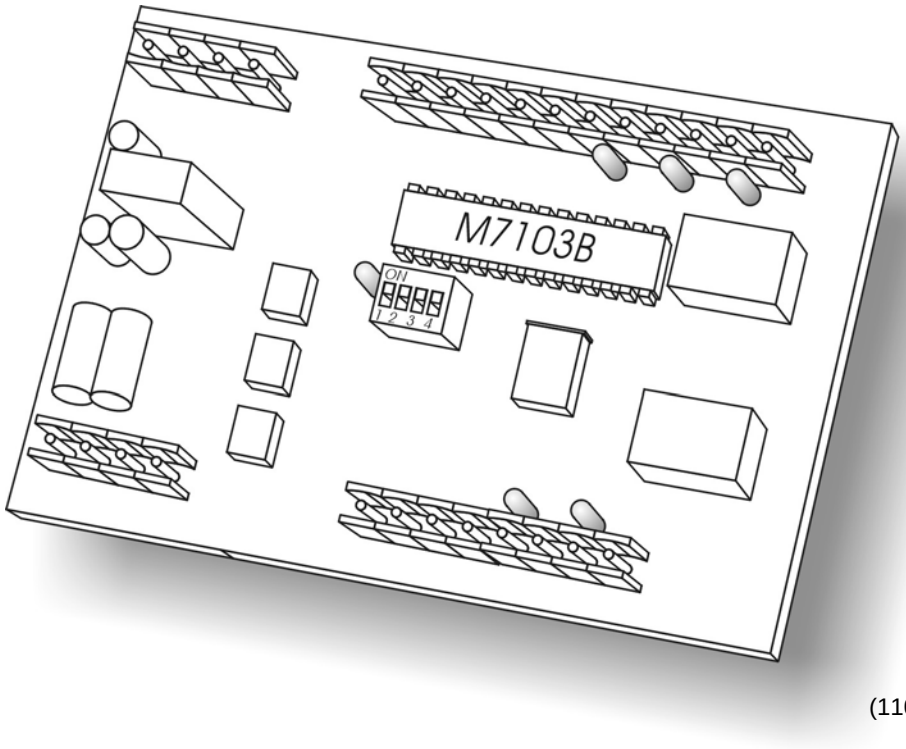
# Product Engineering Guide

## ZIP Module 7103B

## *Introduction*

With the decrease of large programmable controllers and the increase of 'fixed function' controllers being used in buildings there is a growing need for a cost effective way of picking up extra inputs and outputs. ZiP is a modular data acquisition system. It is designed to operate either within a control panel or stand-alone.

A 'ZIP System' is a collective term for the connection of ZIP Modules, ZIPNet, and a ZIPMaster. Some ZIP Modules link together in a 'daisy chain' style using PowerZIP connectors, while others have power and ZIPNet connections built in. A module with built in power and ZIPNet connections is the M7103B.




(110mm x 72mm)

## *ZIP M7103B*

The ZIP M7103B is a 5 Monitored Input, 2 Digital Input, 1 Thermistor Input, 2 Digital Output module. The M7103B is designed to be used to monitor up to 4 'zones' and create a switched output based on fault or alarm. It can also monitor 2 additional 'zones' but these are not associated with the switched output. When the module is connected with power running through it, the green LED beside the Address Switch should be permanently on or flashing. The flashing shows the module is working properly, and as soon as the master has started to communicate with the module the LED will remain continuously lit.

# *Engineering*

## *Step 1 – Power down ZIP System*

Before connecting the ZIP M7103B to the ZIPNet, turn off the power to the Zip System.

## *Step 2 – Set the ZIP Module's Address*

Set the ZIP Module's unique address using the Address Switch. The address of a module must be in the range of 0-15.

## *Step 3 – Connecting the 12V power supply*

Connect a 12VDC @ 250mA power supply to one side of the ZIP M7103B. See section ***'Power Supply and Network'***

### *Step 4 – Connecting the ZIP Net*

Using the appropriate cable connect the ZIP M7103B to your ZIPMaster. See section ***'Power Supply and Network'***

## *Step 5 – Connect External Hardware*

Connect the required inputs / outputs to the Zip Module.

### *Step 6 – Power up ZIP System, including the M7103B*

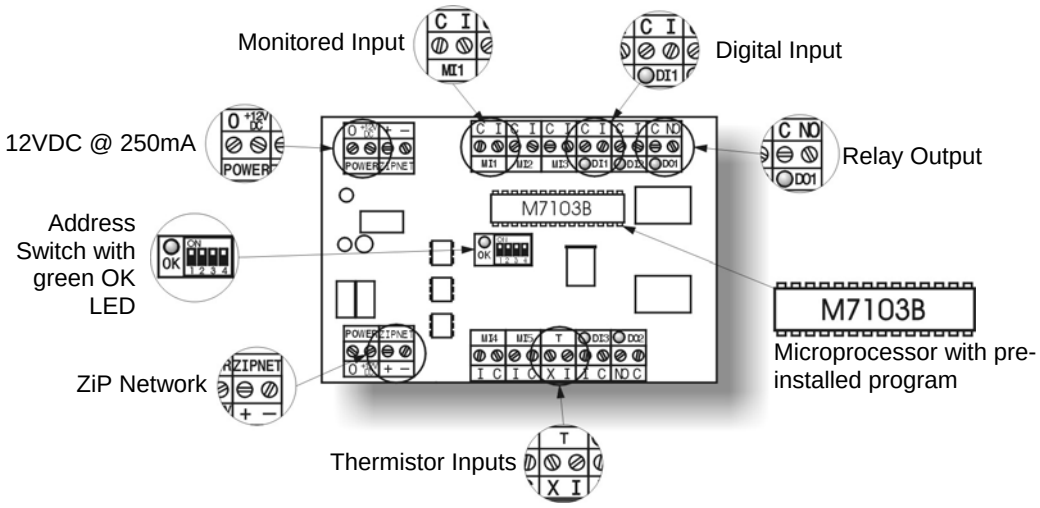
When power is re-applied, the green LED beside the address switch should flash on and off to show the module is working properly. As soon as the master is communicating with the module, the LED will remain continuously lit. If the module fails to communicate with the master the LED will continue to flash.

### *Step 7 – Object Engineering*

Use object-engineering software to access your ZIPMaster and set up the objects within the M7103B.

For greater detail see the relative sections in ***'M7103B Objects'.***

Data from your ZIP Module can now be accessed to test that it is functioning correctly.



## *Address Switch*

The Address Switch allows the module address to be set. There are 16 different addresses available, set with different combinations of the 4 switches labelled 1 to 4. Up is on and down is off.

| Module Address | Switch Position | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| 0 | Off | Off | Off | Off |
| 1 | On | Off | Off | Off |
| 2 | Off | On | Off | Off |
| 3 | On | On | Off | Off |
| 4 | Off | Off | On | Off |
| 5 | On | Off | On | Off |
| 6 | Off | On | On | Off |
| 7 | On | On | On | Off |

| Module Address | Switch Position | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| 8 | Off | Off | Off | On |
| 9 | On | Off | Off | On |
| 10 | Off | On | Off | On |
| 11 | On | On | Off | On |
| 12 | Off | Off | On | On |
| 13 | On | Off | On | On |
| 14 | Off | On | On | On |
| 15 | On | On | On | On |

Examples


With the Address Switch set with 1=on, 2=off, 3=on, 4=off, the modules address will be 5.

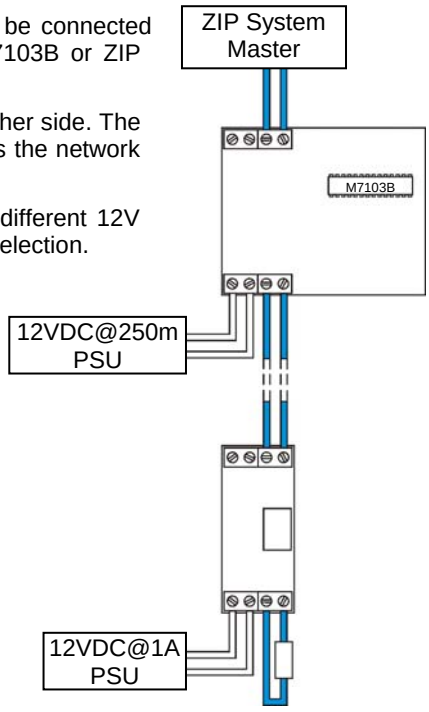

With the Address Switch set with 1=on, 2=off, 3=off, 4=on, the modules address will be 9.

## *Power Supply and Network*

The ZIP M7103B must have a power supply of 12VDC @ 250mA, which can be connected from either side. The 12V-power supply can also be linked to further ZIP M7103B or ZIP NetCards on the ZIPNet, but each card must have 1A.

Like the power supply, the ZIPNet from the ZipMaster can be connected from either side. The last ZIP module on the ZIPNet may require a terminator of 125ohms that across the network connectors.

With the ZIPNet having a maximum length of 1000m, ZIP modules can have different 12V power supplies. The ZIP M7103B's ZIPNet is isolated, simplifying power supply selection.



## *M7103B Objects*

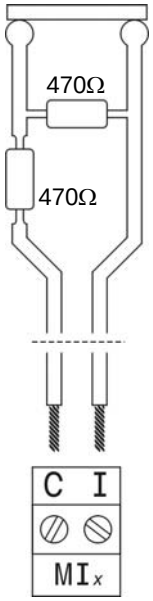
Once the M7103B has been linked to the ZIP Network and the 12VDC power has been connected to the ZIP System, access your ZIP Master using Object Engineering software and set up the objects within the M7103B.

## *Monitored Inputs*

The M7103B has 5 monitored inputs (Z*x*), which are designed to be wired to a normally closed volt-free switch. Two 470Ω resistors, one in parallel and one in series, are required for the connections between the input and the switch to be monitored, and the input to work correctly. The two resistors should be as close to the volt-free as possible.

When the switch has been wired correctly it will report three different states. 'Ok' when the switch is closed, 'Alarm' when the switch is open and 'Fault' if the wiring is cut or disconnected.

Normally Closed Switch



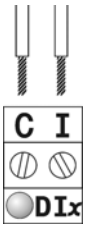

Z*x*

The two terminals are labelled:

- C '*common'*
- I '*input*'

## Digital Inputs

The three digital-inputs are labelled DI1…DI3.



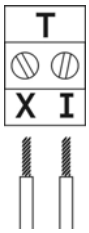

Each digital input is designed to connect directly to a volt-free switch. The digital input's red LED is lit when the volt-free switch is closed

The two terminals are labelled:

- C '*common'*
- I '*input'*

## Thermistor Inputs (10K3A)

The Thermistor input (T) on the M7103B can have a 10K3A thermistor temperature sensor connected to it.



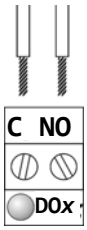

- X *'excitation'*
- I '*input'*

The ZIPMaster takes the input value from the thermistor and calculates the value into a useful engineering unit, ($C^{o}$). This value can then be used elsewhere on the ZiP System.

## Digital Outputs

The two relay outputs are labelled as DO1…DO2.

The relay is capable of handling 125VAC@2A or 30VDC@0.5A. Each output has a red LED that is lit when the output is on. The three terminals are labelled:




- C *'common'*
- NO *'normally Open'*

## Operation

The M7103B is a fixed function ZiP Module, therefore an understanding of how all the inputs and outputs interact with each other is require before use. Since the M7103B is all about monitoring and generating alarms there are two states the module can be in, armed and disarmed. The arming and disarming of the M7103B is controlled by a volt free switch connected to digital input 2 (DI2) known as System Armed Input. When the switch is closed the module is armed, and disarmed when the switch is open.

## M7103B Disarmed.

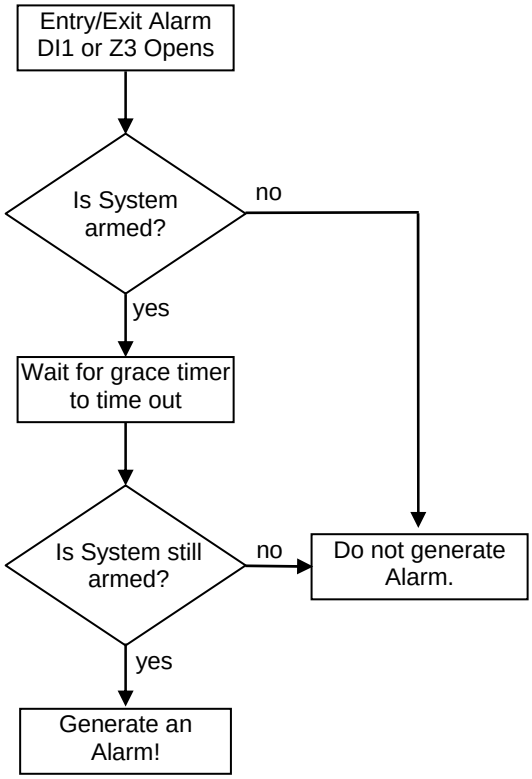
With digital input 2 open and the module in the disarmed state, other inputs will only generate fault alarms.

Monitored inputs 1 to 3 (labelled Z1 to Z3 on the circuit board) must be wired with 2 470Ω resistor as mention early in this document (*see the section Monitored Inputs*). If the switch opens or closes then no alarm is generated, however if the connection from the switch to the monitored input is tampered with, cut or disconnected, then a fault alarm is generated and sent to the ZiPMaster, and 'Alarm Detected' (labelled DO1 on the circuit board) is turned on. Digital output 1 will remain on until fault has been physically repaired.

## M7103B Arming.

When digital input 2 closes a grace timer is activated.

The closing of digital input 2 activates monitored inputs 1 and 2 for change of state alarms. However during this arming period if monitored input 3 and digital input 1 detect a change of state they will wait for the grace timer to finish counting down to give time for any occupants to leave the vicinity. After this timer has counted down monitored input 3 and digital input 1 will generate change of state alarms.




## M7103B Armed.

With digital input 2 closed and the module in the armed state, other inputs will not only generate fault alarms, but also generate change of state alarms.

Monitored inputs 1 and 2 (labelled Z1 and Z2 on the circuit board), which have a normally closed switch attached to them, will generate an alarm and pass it to the ZiPMaster as soon as the switch changes state. They will still generate fault alarms as when then module is disarmed. In addition to alarms being generated for fault and change of state the output 'Alarm Detected' (labelled DI1 on the circuit board) will latch and remain on until the module is disarmed regardless of how many alarms are generated.

## M7103B Disarming.

Monitored input 3 and digital input 1 wait for the grace timer.

When monitored input 3 and digital input 1 detect a change of state they will wait for a period of time (set up in Entry/Exit Grace Time in software) to see if the module is going to be disarmed (digital input 2 being turned off). If the module is not disarmed then they will latch Alarm Detected' (labelled DI1 on the circuit board) and it will remain on until the module is disarmed regardless of how many alarms are generated.