

Product Engineering Guide

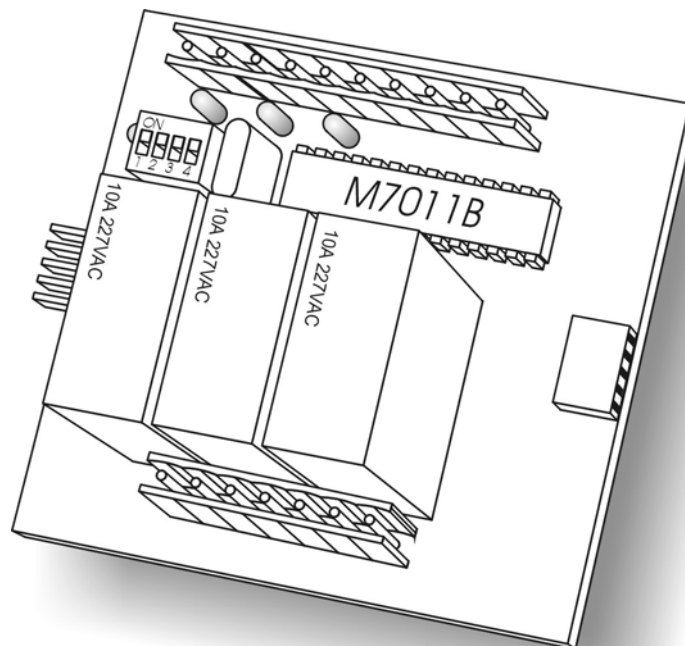
ZIP Module 7011B

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. One of the modules in the 'daisy chain' is the M7011B.

ZIP M7011B



(87mm x 72mm)

The ZIP M7011B is North Communication's domestic boiler controller module. 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 M7011B 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 @ 1A power supply to one side of the ZIP M7011B. See section **'Power Supply and Network'**

Step 4 – Connecting the ZIP Net

Using the appropriate cable connect the ZIP M7011B to your ZIPMaster. See section **'Power Supply and Network'**

Step 5 – Connect External Hardware

Wire the Space Air Temperature Sensor, the Space Air Request, the Water Temperature Sensor, the Water Request, the Pump Enable, the Boiler Enable and the Valve Select to the ZIP Module.

Step 6 – Power up ZIP System, including the M7011B

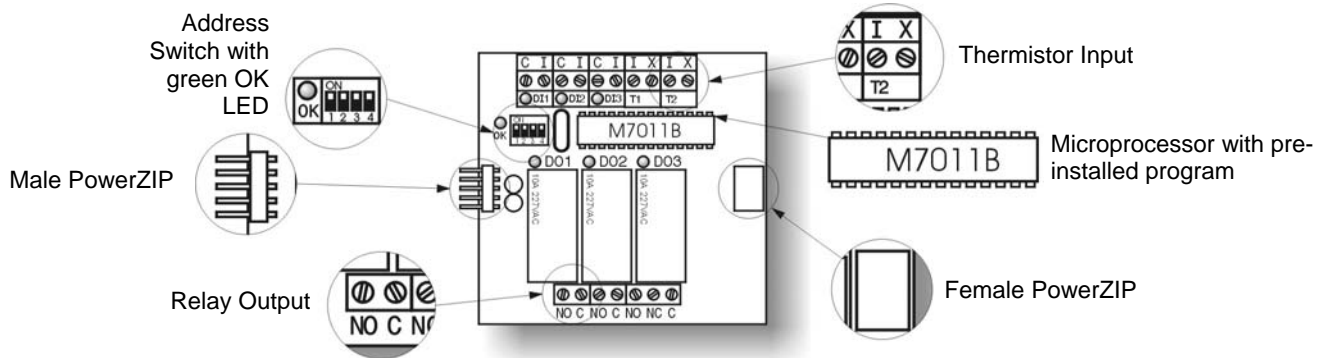
When power is re-applied, the green LED beside the address switch should flash on and off to show the module is working properly. As soon as the master is communicating with the module, the LED will remain continuously lit. If the module fails to communicate with the master the LED will continue to flash.

Step 7 – Object Engineering

Use object-engineering software to access your ZIPMaster and set up the objects within the M7011B.

For greater detail see the relative sections in **'M7011B 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.



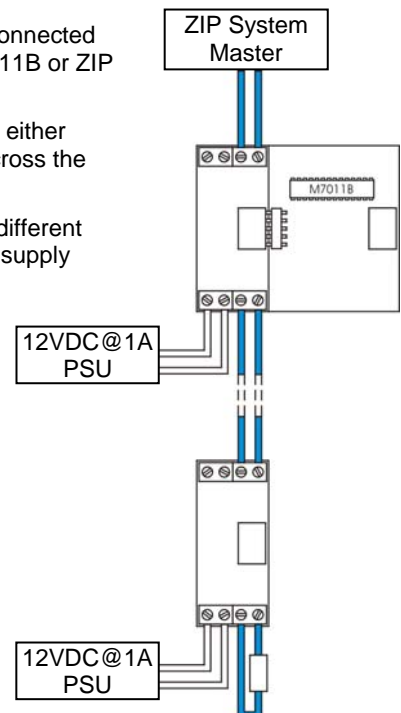
With the Address Switch set with 1=on, 2=off, 3=off, 4=on, the modules address will be 9.

Power Supply and Network module

The ZIP M7011B must have a power supply of 12VDC @ 1A, which can be connected from either side. The 12V-power supply can also be linked to further ZIP M7011B 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 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 M7011B's ZIPNet is isolated, simplifying power supply selection.



M7011B Objects

Once the boiler hardware has been correctly wired in to the module 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 M7011B.

Overall Control Enable CE

The Overall Control Enable is used to enable/disable the ZIP Module. If the Module is disabled then all inputs are ignored and all outputs set to the 'off' condition. If the module is enabled then the following Objects are utilised as documented. The Overall Control Enable Object has the following objects that require engineering:

Label: The label is used in alarm generation.

Enable: This can be written to by the user to enable/disable the ZIP Module.

Current Room Temp SC

The Current Room Temp provides the M7011B with the current Space Air Temperature (requires temperature sensor input) to compare with the Required Room Temp in order to calculate the Space Air Demand for the central heating. If the Space Air Temperature is lower than the chosen Required Room Temp, then there is a Space Air Demand.

The Current Room Temp Object has the following objects that require engineering:

Label: The label is used in alarm generation.

Destination Object: The Destination Object doesn't require engineering for the operation of the M7011B, but if an object reference is applied the value will be sent upon any change.

Alarm Priority: Alarm Priority has a scale from 1 to 9 (1 being the highest, 9 being the lowest). If no priority is set then an alarm will not be generated.

Alarm Delay: The period of time (in seconds) that a value has had to remain in the alarm condition before an alarm is generated.

Alarm High/Low Limit: The Current Room Temp can be set up to generate alarms using this object. If set to High then alarms will be generated if the value exceeds the Alarm High Limit. If set to Low then alarms will be generated if the value goes below the Alarm Low Limit. If set to None then an alarm will not be generated.

Manual Heating SR

The Manual Heating provides the M7011B with a physical override (requires switch input) in order to calculate the Space Air Demand. If the Space Air Demand is required to be 'on' even though the current Space Air Temperature is above the chosen Space Air Setpoint, then this can be used to force it. If this is set to off, then the current Space Air Temperature and the chosen Space Temp Setpoint calculate the Space Air Demand.

The Manual Heating Object has the following objects that require engineering:

Label: The label is used in alarm generation.

Destination Object: The Destination Object doesn't require engineering for the operation of the M7011B, but if an object reference is applied the value will be sent upon any change.

Alarm Priority: Alarm Priority has a scale from 1 to 9 (1 being the highest, 9 being the lowest). If no priority is set then an alarm will not be generated.

Alarm Delay: The period of time (in seconds) that a value has had to remain in the alarm condition before an alarm is generated.

Alarm Condition On/Off: Text labels used in alarm generation.

Heating Enable SE

The Heating Enable is used to enable/disable the Space Air Demand. For example, they may be periods during the day that even though there may be a Space Air Demand, the user does not want the heating to come on, such as during the middle of the night. The Heating Enable could be controlled in such cases by a Time Switch.

The Heating Enable Object has the following objects that require engineering:

Label: The label is used in alarm generation.

Enable: This doesn't require engineering but can be written to by other objects to enable/disable the Space Air Demand.

Required Room Temp 1 S1 and Required Room Temp 2 S2

The Required Room Temp 1 and the Required Room Temp 2 are Space Air Temp Setpoints. The current Room Temperature is measured against the enabled Setpoint to calculate the Space Air Demand. There are two Setpoints as different temperatures may be required for different times of the day or year. For example, a relatively high Setpoint may be used during the day when people are more aware of the temperature, although during the night it need not be so high. Also, one Setpoint could be used as a minimum temperature for winter periods to prevent the pipes from freezing.

The Required Room Temp Objects have the following objects that require engineering:

Label: The label is used in alarm generation.

Value: allows user or other objects to adjust required setpoint

Override Enable: This object is used to enable the override of a Setpoint value and can be written to by other objects.

Override Value: This object becomes the Setpoint Value when the override is enabled.

Required Setpoint Selector SS

The Required Setpoint Selector is used to select which of Setpoint 1 and Setpoint 2 is the Required Setpoint that the current Room Temperature is measured against.

The Required Setpoint Selector Object has the following objects that require engineering:

Label: The label is used in alarm generation.

Selector: This can be written to by the user or other objects to select the chosen Setpoint.

Current Water Temp WC

This object provides the M7011B with the current Water Temperature (requires temperature sensor input) to compare with the Water Temp Setpoint in order to calculate the Water Demand for the water heating. If the Water Temperature is lower than the Water Temp Setpoint, then there is a Water Demand.

The Current Water Temp Object has the following objects that require engineering:

Label: The label is used in alarm generation.

Destination Object: The Destination Object doesn't require engineering for the operation of the M7011B, but if an object reference is applied the value will be sent upon any change.

Alarm Priority: Alarm Priority has a scale from 1 to 9 (1 being the highest, 9 being the lowest). If no priority is set then an alarm will not be generated.

Alarm Delay: The period of time (in seconds) that a value has had to remain in the alarm condition before an alarm is generated.

Alarm High/Low Limit: The Current Water Temp can be set up to generate alarms using this object. If set to High then alarms will be generated if the value exceeds the Alarm High Limit. If set to Low then alarms will be generated if the value goes below the Alarm Low Limit. If set to None then an alarm will not be generated.

Manual Water WR

The Manual Water provides the M7011B with a physical override (requires switch input) in order to calculate the Water Demand. If the Water Demand is required to be 'on' even though the current Water Temperature is above the Water Temp Setpoint, then this can be used to force it. If this is set to off, then the current Water Temperature and the Water Temp Setpoint calculates the Water Demand.

The Manual Water Object has the following objects that require engineering:

Label: The label is used in alarm generation.

Destination Object: The Destination Object doesn't require engineering for the operation of the M7011B, but if an object reference is applied the value will be sent upon any change.

Alarm Priority: Alarm Priority has a scale from 1 to 9 (1 being the highest, 9 being the lowest). If no priority is set then an alarm will not be generated.

Alarm Delay: The period of time (in seconds) that a value has had to remain in the alarm condition before an alarm is generated.

Alarm Condition On/Off: Text labels used in alarm generation.

Water Enable WE

The Water Enable is used to enable/disable the Water Demand. For example, they may be periods during the day that even though there may be a Water Demand, the user does not want the water heating to come on, such as during the middle of the night. The Water enable could be controlled in such cases by a Time Switch.

The Water Enable Object has the following objects that require engineering:

Label: The label is used in alarm generation.

Enable: This can be written to by the user or other objects to enable/disable the Water Demand.

Water Temp Setpoint W1

The current Water Temperature is measured against the Water Temp Setpoint in order to calculate the Water Demand.

The Water Temp Setpoint Object has the following objects that require engineering:

Label: The label is used in alarm generation.

Value: allows user or other objects to adjust required setpoint

Override Enable: This object is used to enable the override of a Setpoint value and can be written to by other objects.

Override Value: This object becomes the Setpoint Value when the override is enabled.

Pump Enable PE

The Pump Enable provides the M7011B with a physical output (on-board relay) that can control the status of a pump. The Pump Enable is initially 'on' when there is a Space Air Demand and/or a Water Demand. This will start the pump allowing the water to flow into the boiler. When the demand ceases, the Pump Enable will go to the 'off' condition after the period specified by the Pump Off Delay. This is to use the water that has been heated by the boiler but has yet to pass into the system.

The Pump Enable Object has the following objects that require engineering:

Label: The label is used in alarm generation.

Destination Object: The Destination Object doesn't require engineering for the operation of the M7011B, but if an object reference is applied the value will be sent upon any change.

Alarm Priority: Alarm Priority has a scale from 1 to 9 (1 being the highest, 9 being the lowest). If no priority is set then an alarm will not be generated.

Alarm Delay: The period of time (in seconds) that a value has had to remain in the alarm condition before an alarm is generated.

Alarm Condition On/Off: Text labels used in alarm generation.

Boiler Enable BE

The Boiler Enable provides the M7011B with a physical output (on-board relay) that can control the status of a boiler's firing mechanism. The Boiler Enable is initially 'on' when there is a Space Air Demand and/or a Water Demand **and** the period specified by the Boiler On Delay has elapsed. This will start the boiler heating the water that is being pumped through it. When the demand ceases **and** the period specified by the Boiler Min On has elapsed, the Boiler Enable will go to the 'off' condition.

The Boiler Enable Object has the following objects that require engineering:

Label: The label is used in alarm generation.

Destination Object: The Destination Object doesn't require engineering for the operation of the M7011B, but if an object reference is applied the value will be sent upon any change.

Alarm Priority: Alarm Priority has a scale from 1 to 9 (1 being the highest, 9 being the lowest). If no priority is set then an alarm will not be generated.

Alarm Delay: The period of time (in seconds) that a value has had to remain in the alarm condition before an alarm is generated.

Alarm Condition On/Off: Text labels used in alarm generation.

Valve Select VS

The Valve Select provides the M7011B with a physical output (on-board relay) that can control the status of a valve. The Valve Select allows the flow of heated water to go in one of two directions, to the water system or to the heating system. If there is a Water Demand then the Valve Select is set to 'water'. If there is a Space Air Demand the Valve Select is set to 'heating'. If there is a demand for both water and heating then water takes priority. This is because a body of water takes a shorter period of time to heat than Space Air.

The Valve Select Object has the following objects that require engineering:

Label: The label is used in alarm generation.

Destination Object: The Destination Object doesn't require engineering for the operation of the M7011B, but if an object reference is applied the value will be sent upon any change.

Boiler On Delay BD

The Boiler On Delay is the period of time after the initial demand (and pump is enabled) that the boiler will come on. This allows a flow of water through the boiler before heating occurs, so that stationary water is not being heated causing possible damage to pipes.

The Boiler On Delay Object has the following objects that require engineering:

Label: The label is used in alarm generation.

Time: The delay in seconds.

Boiler Min On BM

The Boiler Min On is the minimum period of time after the boiler is enabled that it will remain enabled for. This prevents the boiler firing mechanism being over used when a temperature is on the cusp of the setpoint.

The Boiler Min On Object has the following objects that require engineering:

Label: The label is used in alarm generation.

Time: The delay in seconds.

Pump Off Delay PD

The Boiler Min On is the period of time after the demand has ceased (and boiler is disabled) that the pump will stop. This enables the water that has been heated by the boiler but has yet to pass into the system to be used.

The Pump Off Delay Object has the following objects that require engineering:

Label: The label is used in alarm generation.

Time: The delay in seconds.

Once the M7011B Objects have been engineered, data from your ZIP Module can be accessed to test that it is functioning correctly.