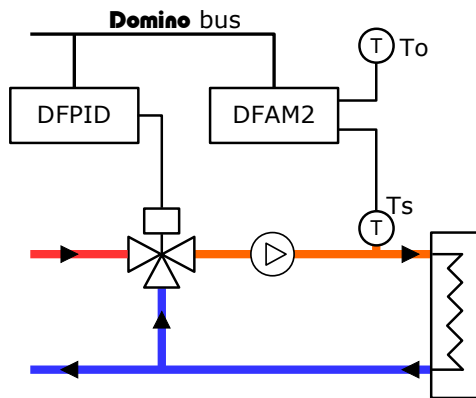


DFPID: 0-10V analog output PID regulator and 2 generic power relay outputs

DFPID module is a temperature regulator of the supply fluid, typically in a heating system. The regulation controls a 0-10V servo-assisted valve. DFPID is a climatic type regulator as it is possible to link the supply temperature set point to the external temperature.

The control system requires, in addition to the DFPID module, a temperature probe on the supply pipe and an outdoor temperature probe, in addition of course to the servo-assisted mixing valve with 0-10V input.

The two temperature probes (supply and outdoor) will be connected to one or more **Domino** DFAM2 modules. The following figure shows a typical regulation situation of the supply fluid temperature (T_s) with outdoor temperature compensation (T_o).



The DFPID module can be however set so that the regulation is independent of the external temperature, in which case only the supply temperature probe will be required.

The module also features two power relay outputs for general uses which can therefore be managed by programming to implement the desired functions.

A 2-way terminal block allows the module to be connected to the bus; the bus itself also carries the power supply for the module operation.

Near to the bus terminal block, the module features a small pushbutton with double function (see the related paragraph) and a green LED that shows the operating status; the same green LED normally flashes every 2 seconds about to signal that the module is properly supplied and operating. Removing the cover of the bus terminal block, a small connector (PRG) can be accessed; this one allows the connection to the optional tester/programmer.

On the other side of the module, a terminal block allows the connection to the contacts of the internal relays and to the 0-10V control analog output. DFPID housing is a standard DIN 3M module.

Note: this data sheet applies DFPID module equipped with firmware 1.0 or higher.

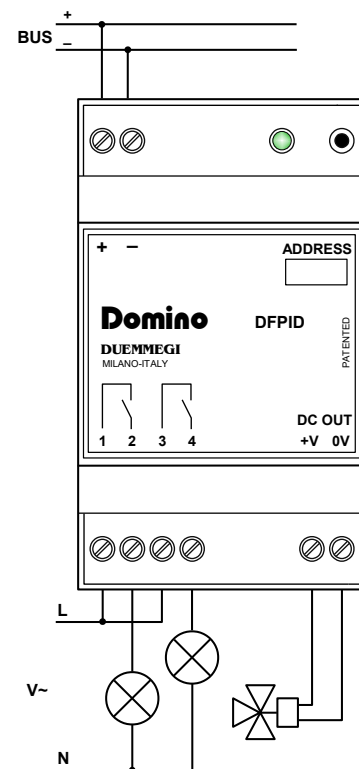


Address programming

The DFPID module takes one output address and optionally two input addresses. A white label on the front panel allows to write the assigned base address for an immediate visual identification.

Wiring

The following schematic diagram shows the connections between DFPID module, the **Domino** bus, two generic electrical loads (e.g. lamps) and a servo-assisted valve or other device with 0-10V input.



Information on the bus

The two input addresses of DFPID module, if enabled, report the following information:

IN		
Point	n	n+1
1	Out 1	PID output value (0-100%)
2	Out 2	
3	-	
4	-	
5	-	
6	-	
7	-	
8	-	
9	Ts fail	
10	To fail	
11	-	
12	-	
13	-	
14	-	
15	-	
16	-	

Out 1 and Out 2 are the status of the two relay outputs of the module. The two points Ts fail and To fail will be activated when DFPID module cannot receive the supply and/or the outdoor temperature, for instance due to a fault to the probes or to the modules to which these probes are connected.

The output address of DFPID module reports:

OUT	
Point	n
1	Command Out 1
2	Command Out 2
3	-
4	-
5	-
6	-
7	-
8	-
9	Set PID value (0-100%)
10	
11	
12	
13	
14	Disable PID
15	
16	

Points 1 and 2 allows to control, through the bus, the two relays inside the module.

Activating point 16, the regulator will be disabled and the 0-10V output can be set to any value in the range 0.. 100%.

By deactivating point 16 the analog output returns under the control of the PID and points 9..15 will be aligned to the current value. These commands may be useful to carry out maintenance and setting up operations.

Outputs 1 and 2 related to the two relays of the module (1 = relay contact closed) support all the typical functions of the **Domino** system, as here below listed:

- Logic combinations (& | !)
- Set/Reset (S R)
- Toggle (T S R, included actuation timeout)
- Timer (max 8 for module)
- Scheduler
- Analog threshold

Point 16, on the other hand, cannot be programmed by means of equations but only controlled via the bus.

For more details on programming the ON-OFF outputs, refer to the general **Domino** programming manual.

Module type statement

When using DFPID modules in a **Domino** bus, it is mandatory to declare the type of module.

When using **DCP IDE**, it is enough to declare the modules in the Configuration tab. If DFCP controller is not installed, and thus **BDTools** is used, the declaration must be added to the "program body".

In both cases, the syntax is the same and it is described here below. Also keep in mind that the statement **does not** configure the module, but simply it "declares" its presence and the occupied addresses.

Assuming that the base address assigned to a DFPID is 1, the syntax of the statement is as follows:

$$DFPID = (I1, I2, O1)$$

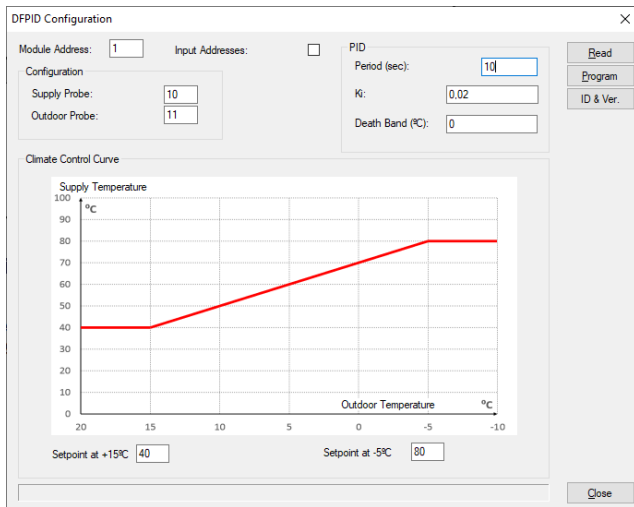
If the two input addresses have not been enabled (if they are not used), then they will be omitted as follows:

$$DFPID = (O1)$$

DFPID configuration panel

The DFPID configuration panel available in DCP IDE and BDTools allows to configure the module as desired. The configuration of the module is performed through the **Domino** bus as described below.

From the main menu of BDTools or DCP IDE select Configuration, Temperature and finally DFPID; the following window will appear:



Mapping

BDTools and DCP Ide allow to display the map of DFPID module as shown in the following figure.



Module Address: is the address of DFPID module to be set or read.

Input Addresses: enabling this check box, the two optional input addresses of DFPID will be enabled (the value of the first address will be the same one assigned to the output).

Supply Probe: enter the address of the module to which the supply probe is connected.

Outdoor probe: enter the address of the module to which the outdoor probe is connected.

Period: it is the integral time (how often the controller compares the setpoint and temperature and calculates the output value); optimal value 10s.

Ki: integral coefficient of the regulator; the value 0.02 should be suitable for most cases, possibly it can be varied taking into account that a higher Ki makes the response fast but could generate oscillations, while a lower Ki slows down the response but the regulation is more precise.

Dead band: temperature range around the set point within which the PID output remains unchanged; for best regulation leave this value to zero.

Setpoint at +15°C e Setpoint at -5°C: are the values that the setpoint must assume respectively at temperatures greater than or equal to 15°C and less than or equal to -5°C; within this temperature range, the regulator setpoint varies as indicated by the straight line in the graph.

Read and Program: read or transfer the current settings.

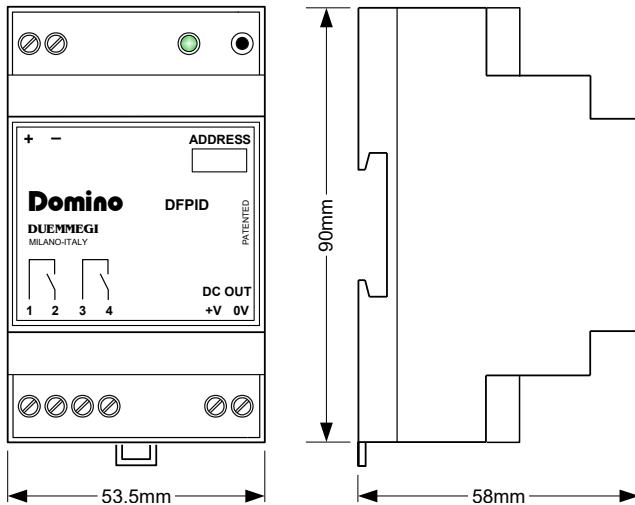
ID & Ver.: ask for the firmware version of DFPID module.

Close: exit the configuration panel.

Technical characteristics

Power supply (bus side)	By specific centralized power supply mod. DFPW2
Current consumption	Equivalent to 2 standard Domino modules
Voltage output controlled by PID regulator	0-10V / 10mA
Setpoint setting range	0 ÷ +100 °C
Outdoor temperature compensation	Linear in the range -5 ÷ +15 °C
MAX Contact rating (each output)	<ul style="list-style-type: none"> Resistive load (cosfi = 1): 12A at 250V~ (3000VA) Inductive load (cosfi = 0.5): 3.6A at 250V~ (900VA) Incandescent lamps: 8A at 250V~ (2000VA) Fluorescent lamps: 350W with 42uF MAX power factor correction capacitor
MAX switching voltage	250V~
Housing	DIN standard 3M for DIN rail
Operating temperature	-5 ÷ +50 °C
Storage temperature	-20 ÷ +70 °C
Protection degree	IP20

Outline dimensions



Correct disposal of this product



(Waste Electrical & Electronic Equipment) (Applicable in the European Union and other European countries with separate collection systems). This marking on the product, accessories or literature indicates that the product should not be disposed of with other household waste at the end of their working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources. Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take these items for environmentally safe recycling. This product and its electronic accessories should not be mixed with other commercial wastes for disposal.

Installation and use restrictions

Standards and regulations

The design and the setting up of electrical systems must be performed according to the relevant standards, guidelines, specifications and regulations of the relevant country. The installation, configuration and programming of the devices must be carried out by trained personnel.

The installation and the wiring of the bus line and the related devices must be performed according to the recommendations of the manufacturers (reported on the specific data sheet of the product) and according to the applicable standards.

All the relevant safety regulations, e.g. accident prevention regulations, law on technical work equipment, must also be observed.

Safety instructions

Protect the unit against moisture, dirt and any kind of damage during transport, storage and operation. Do not operate the unit outside the specified technical data.

Never open the housing. If not otherwise specified, install in closed housing (e.g. distribution cabinet). Earth the unit at the terminals provided, if existing, for this purpose. Do not obstruct cooling of the units. Keep out of the reach of children.

Setting up

The physical address assignment and the setting of parameters (if any) must be performed by the specific softwares provided together the device or by the specific programmer. For the first installation of the device proceed according to the following guidelines:

- Check that any voltage supplying the plant has been removed
- Assign the address to module (if any)
- Install and wire the device according to the schematic diagrams on the specific data sheet of the product
- Only then switch on the 230Vac supplying the bus power supply and the other related circuits

Applied standards

This device complies with the essential requirements of the following directives:

- 2014/30/UE (EMC)
- 2014/35/UE (Low Voltage)
- 2011/65/UE (RoHS)

Note

Technical characteristics and this data sheet are subject to change without notice.