

DFIGLASS/T: Glass keypad with touch commands, backlight and ambient temperature probe

DFIGLASS/T is a “touch” keypad available with 6, 4 and 2 commands, specifically developed for **Domino** bus system. The front panel is made by glass. The available standard colors are white with white backlight and black with blue backlight; under request, version of different colors and with customized icons can be provided. DFIGLASS/T also features an ambient temperature probe.

Each keypad, regardless of the number of buttons, features an array of 6 LEDs; these LEDs are seen as generic output points of the **Domino** bus, therefore the operation of the backlight can be freely defined using the functions of the **Domino** system. The keypad can be configured to generate a beep at any touch of the buttons.

The housing of keypad DFIGLASS/T is suitable for the mounting in standard wall boxes (mod. 503 or similar); it is recommended to check the compatibility with boxes for plasterboard walls.

The power supply needed for the module operation is carried by the bus itself. On the rear side of the keypad, a removable terminal block allows the connection to **Domino** bus; a small pushbutton near to this terminal block allows the address programming and a green LED shows when the module is ready to receive the address itself; the same LED normally flashes every 2 seconds about to signal that the module is properly operating. A small connector (PRG) allows the connection to the optional DFPRO tester/programmer.

DFIGLASS/T keypad takes 1 or 2 input and 1 output address; the second input address is related to the ambient temperature probe and, if not used, it can be disabled. A label on the rear side allows the writing of the assigned address for an immediate visual identification. For more details about the address assigning, refer to the related documentation.

Note: this technical sheet refers to DFIGLASS/T equipped by firmware 3.0 or higher; this firmware is not back-compatible with the previous versions 1.x and 2.x.

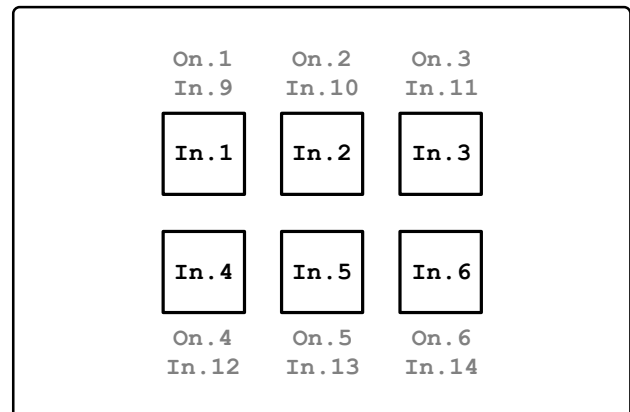
Operation

DFIGLASS/T keypad takes 1 input address and 1 output address having the same value; if the ambient temperature probe is needed, the second input address has to be enabled. The input points at the base address report the status of the keys (In. 1 ÷ In. 6), while the output points control the LEDs (On. 1 ÷ On. 6) and some other functions as described later. The status of the 6 LEDs is also reported in the input section by points In. 9 ÷ In. 14 so that the status of the LEDs can be used by other equations of the **Domino** bus system.

Regarding the output section, in addition to points On. 1 ÷ On. 6 related to the LEDs, some other points are available as described later.



The following figure shows the relationship between the keys, the LEDs and the related bus points (DFIGLASS/T oriented as shown by the label on the back).



The following table resumes all available input and output points:

Point	IN n	OUT n	IN n+1
1	Key 1	Command LED 1	Ambient Temperature (°K x 10)
2	Key 2	Command LED 2	
3	Key 3	Command LED 3	
4	Key 4	Command LED 4	
5	Key 5	Command LED 5	
6	Key 6	Command LED 6	
7	-	-	
8	Proximity	-	
9	Status of LED 1	Calibration (*)	
10	Status of LED 2	-	
11	Status of LED 3	Cleaning (*)	
12	Status of LED 4	Night backlight	
13	Status of LED 5	BL on proximity (*)	
14	Status of LED 6	Backlight	
15	-	Buzzer enable (*)	
16	-	-	

(*) These point cannot be controlled by equation

DFIGLASS/T

In details:

Inputs

- **In. 1 ÷ In. 6** (Keys): reports the status of the related key (1=active)
- **In. 8** (Proximity): activated when detecting proximity (e.g. the hand at about 3cm away from the keypad)
- **In. 9 ÷ In. 14** (Status of LED): reports the status of the related LED (1=ON)
- **I (n+1)** (Ambient Temperature): value of the ambient temperature detected by the DFIGLASS/T sensor (if available), expressed in °Kx10; for instance, 2980 means: (2980 - 2730) / 10 = 25.0°C. The temperature address may however be disabled by the BDTools or DCP Ide configuration panel.

Outputs

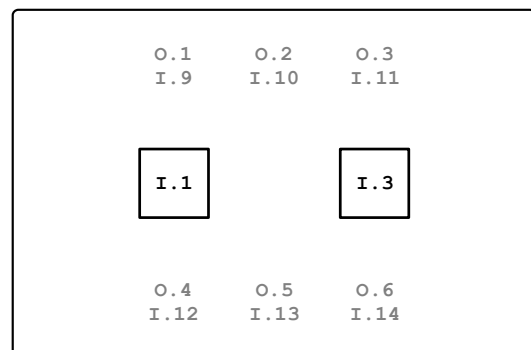
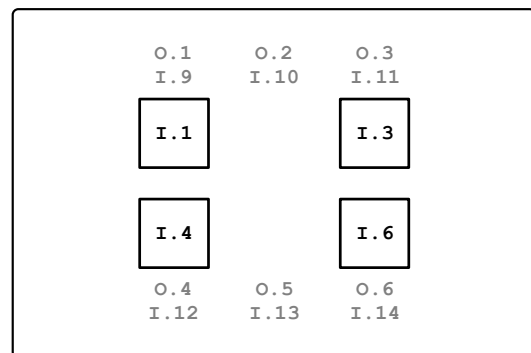
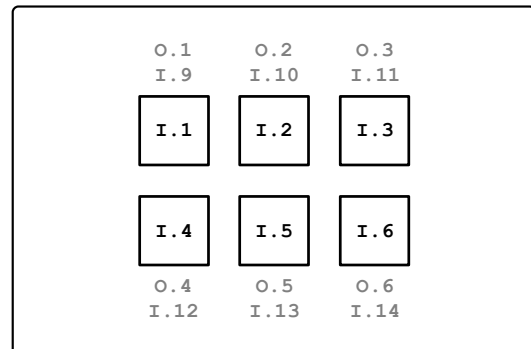
- **On. 1 ÷ IO. 6** (LED): LED control (1=ON); these output points can be programmed by equations as a common Domino output module
- **On. 9** (Calibration): force the calibration of the keys; normally this recalibration is not necessary, anyway this point must not be left active. This point cannot be controlled by equations
- **On. 11** (Cleaning): force the “Cleaning” mode, allowing to clean the glass without the risk of unintentional detection of the keys, resulting in possible switching of outputs. The “Cleaning” function is indicated by the flashing of the backlight. This point cannot be controlled by equations
- **On. 12** (Night backlight): the configuration panel allows to define two different levels of backlight which, to simplify, we call Day and Night; **On. 12**, when active, forces the Night backlight. This point can be programmed by equations
- **On. 13** (BL on proximity): when activated, it enables the switching ON of backlight when detecting a proximity (regardless of backlight setting in the configuration panel). This point cannot be controlled by equations
- **On. 14** (Backlight): when active, backlighting is switched ON, provided that the backlight has been set as controlled by bus in the configuration panel. This point can be programmed by equations
- **On. 15** (Buzzer enable): when activated, the buzzer will be enabled (provided that the Buzzer has been set as controlled by bus in the Configuration Panel). This point cannot be controlled by equations

Resuming, the output points that can be programmed by equations are:

- the 6 LEDs: **On. 1 ÷ On. 6**
- the Night backlight control: **On. 12**
- the backlight control: **On. 14**

All other points can be only controlled by bus (e.g. supervisor or similar).

The following figures show the assignment of the input and output points for the different available versions in 6, 4 and 2 keys; for all versions, the number of LEDs is always 6.



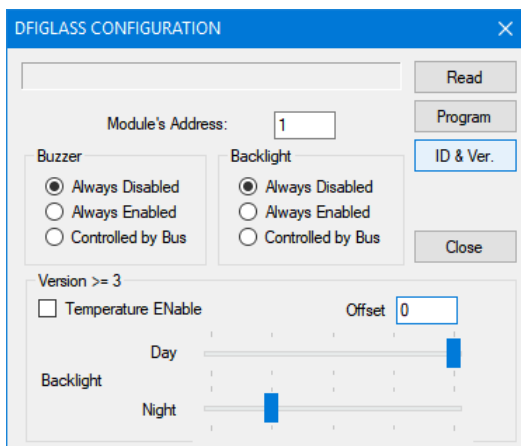
As said before, the operation of the 6 LED outputs can be freely defined by equations using the functions of **Domino** system.

The following paragraphs provide more details about the configuration and operation of DFIGLASS/T.

DFIGLASS/T

Backlight and Buzzer

Each key of DFIGLASS/T can be lighted by a LED (or two LEDs in the case of 2 keys version). There are 2 levels of backlight, one very low and common to all 6 LEDs and one of highest level independent for each one of the 6 LEDs. The “common” backlight keeps illuminated all the keys so that, for example, they can be easily identified in the darkness; this type of backlight is controlled by the DFIGLASS/T configuration panel available in BDTools or DCP Ide. To access to this panel select, from main menu, Configuration, Input Modules and finally DFIGLASS; the following window will be shown:



Module's Address is the address of DFIGLASS/T to be configured; for the backlight, like for the buzzer, 3 options are available:

Always Disabled: this means that the backlight (or the buzzer) is always turned off and it cannot be activated not even by acting on the output point 14 (15 in the case of the buzzer) that will be always OFF

Always Enabled: this means that the backlight (or the buzzer) is always turned on and it cannot be deactivated not even by acting on the output point 14 (15 in the case of the buzzer) that will be always ON

Controlled by Bus: this means that the backlight (or the buzzer) can be controlled (turned on and off) by acting on the output point 14 (15 in the case of the buzzer)

Note: *the output point 14 (Backlight) can be controlled by equations (pointed that the option “Controlled by Bus” in the configuration panel has been activated). The output point 15 (Buzzer), on the contrary, CANNOT be controlled by equations.*

In the case of DFIGLASS/T version 3 or higher, the backlight level, both the common one and that one related to each single key, can be set on two different levels; these two levels can be set in the same configuration panel using the two Day and Night sliders. As described in the previous paragraph, switching between the two levels is controlled by Output Point 12 (Night backlight).

As said before, if the temperature probe is not needed, the second input address can be disabled (by factory configuration it is disabled).

The Offset parameter allows to correct, if required, the temperature value detected by the sensor; for instance, entering +0.2 as offset, DFIGLASS/T will add the value 0.2 to the measured value; if the sensor measures 25.3 °C, then the temperature value reported on the bus will be : 25.3 + 0.2 = 25.5 °C. Setting instead the offset to -0.2, the temperature value sent on the bus will be: 25.3 – 0.2 = 25.1 °C. Once selected the desired options, press the Program button; the Read button allows to see the current settings of the specified DFIGLASS/T, while the button ID & Ver. allows to read the firmware version.

Proximity mode

In some applications, for instance in bedrooms, the backlight always ON is not appreciated, even if at very low level; on the other hand, acting on the keys in the darkness may be a problem.

To answer to this need, the proximity mode can be activated by the point 13 of the output section; the approaching of the finger to the keypad will switch ON the backlight without any key activation, thus allowing to see the keys in the darkness. The backlight of the keypad will remain ON for 2 seconds after the finger removing.

Note: *output point 13 (Proximity) CANNOT be controlled by equations.*

Temperature

DFIGLASS/T features an ambient temperature probe; the measured value is sent on the bus (if the second input address has been enabled) in °Kx10 format, according to the following relationship:

$$T_a = (V_{bus} - 2730) / 10$$

where t_a is the ambient temperature and V_{bus} is the value sent on the bus by DFIGLASS/T. For instance, 2980 means: $(2980 - 2730) / 10 = 25.0^{\circ}\text{C}$.

Cleaning mode

The “cleaning” mode allows to clean the glass avoiding the risk to cause a unwanted detection of the keys, and thus a consequent possible actuation of some outputs. To enter the cleaning mode, press at the same time the keys 1-2-3 or 4-5-6 for 2.5 seconds, or activate point 11 of the output section. For keypad versions without middle key (2 and 4 keys), the same rule applies, therefore the “blank” area between the two outside buttons has to be touched. When the cleaning function is activated, the backlight blinks (0.5s ON and 0.5s OFF). The output point 11 reports the status of the cleaning function (activated when the function is ON).

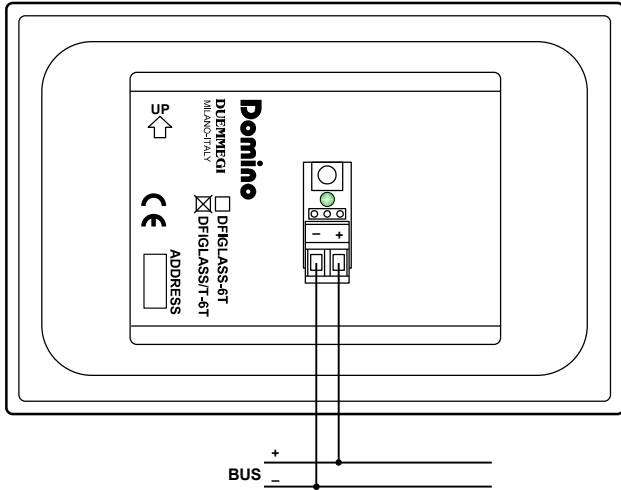
To exit the “cleaning” mode, the same operation must be performed (pressing three points for 2.5 seconds at the same time or disabling the point 11 of the output section).

The cleaning mode will be however automatically deactivated after 2 minutes.

Note: *output point 11 (Cleaning) CANNOT be controlled by equations.*

Module connection

DFIGLASS/T keypad requires only the connection to the **Domino** bus as shown in the following schematic diagram.



Programming examples

As said before, the status of output points related to the 6 LEDs is replicated in the input section (points 9 ÷14). This architecture allows to easily create commands for lighting as shown in the following example.

Suppose to have assigned the address 1 to DFIGLASS/T keypad and that you want to control a lamp (connected for instance to the output O42.1) by the key 1 of DFIGLASS/T. Also assume that the LED related to the key 1 has to follow the status of the lamp.

A possible program can be the following:

```
DFIGLASS = ( I1, O1 ) // DFIGLASS
O1.1 = TI1.1 // toggle LED1
O42.1 = I1.9 // lamp output
```

The key **I1.1** of DFIGLASS/T changes, at each touch, the status of the corresponding LED; the status of the LED1, reported by **I1.9**, is then copied to the output **O42.1** connected to the lamp.

In this way there is the assurance that the lamp and the LED are always aligned because the status of the LED will be always reported to the lamp.

Note the statement **DFIGLASS = (I1, O1)** specifying that address 1 (IN and OUT) is related to the “digital” section of DFIGLASS/T keypad; this statement (one for each DFIGLASS/T) is mandatory and, if omitted, some errors may occur during the program compiling or when attempting to transfer the program to the device.

If the application requires to switch ON the LED when the light is OFF (for example, to locate the key in the darkness), simply modify the previous program as follows:

```
DFIGLASS = ( I1, O1 ) //DFIGLASS
O1.1 = TI1.1 // toggle LED1
O42.1 = !I1.9 // lamp output
```

The status of a LED, of course, can be reported on another LED; this is useful in the case of keypads with 2 keys to turn on both the LEDs below and above that key (however according to the preferences of the user).

If the ambient temperature probe has been enabled, and therefore the related input address is activated, this must be declared as follows:

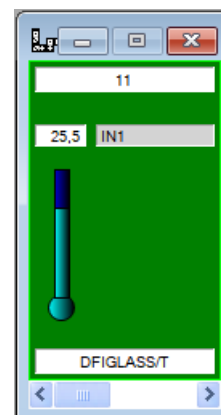
```
DFIGLASS/T = ( I2 )
```

Mapping

DFIGLASS/T keypad is shown in the map of BDTools or DCP Ide as a mixed input/output module, like shown in the following figure.



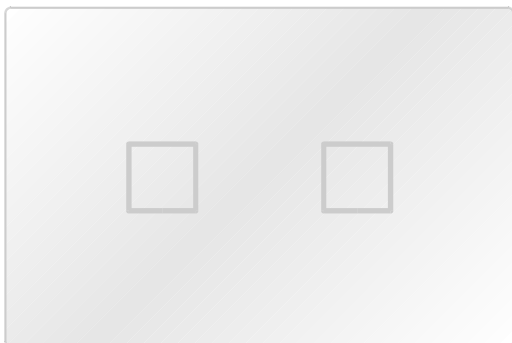
The ambient temperature section, if enabled, will be shown in the map as a separated module having address n+1 and identified as DFIGLASS/T:



As for all **Domino** modules, the background is in green color if the module is connected and properly working, otherwise the background is in red color. The status of input and output points is shown on the map in red or green color depending on the status ON or OFF respectively.

DFIGLASS/T

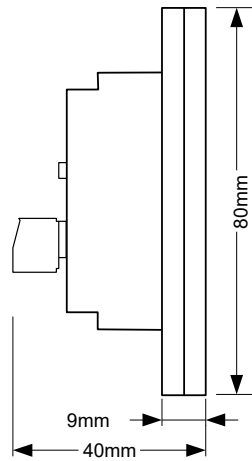
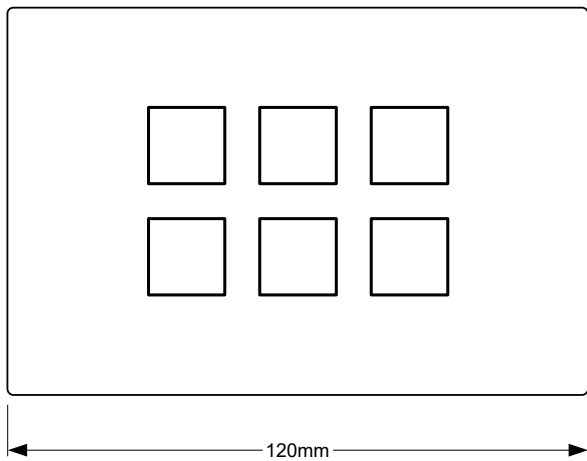
Available versions



Technical characteristics

Power supply (bus side)	By specific centralized power supply mod. DFPW2
Current consumption bus side	Equivalent to 3 standard modules
Number of keys	6, 4 and 2 with LED backlight
Number of LED	6, with dimming of the backlight level
Buzzer	Internal, it can be disabled
Ambient Temperature probe:	
Temper. measurement range	-20 ÷ +50 °C
Temper. measur. resolution	0.1 °C
Temper. measur. Linearity	±0.3 °C
Temper. measur. MAX error	±0.3 °C
Colors	Black with blue LEDs White with white LEDs Custom versions on request
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.