DFGT-03MCXXX Quick Start Guide

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2	December 3, 2019	Team Alpha	Updated chapter Diagnostics
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15	October 29, 2021	Team Alpha	Updated minimum wave height default value

Table of Contents

1 Introduction

1.1 Purpose

This document describes a quick start guide for setting up the *decorative fireplace gas transceiver* (DFGT) for a decorative fireplace. It covers configuring the controller and installation instructions. The DFGT-03MC18 only has Ramses RF communication and the DFGT-03MCB23 has both Ramses RF and Bluetooth Low-Energy communication. Where possible, they are referred to as DFGT.

1.2 Terms, Acronyms and Abbreviations

Below are the terms, acronyms, and abbreviations used within this document. Additional project-specific terms can be found in the project glossary.

Term, Acronym, Abbreviation	Definition
DFGT	Decorative Fireplace Gas Transceiver
DFRC	Decorative Fireplace Remote Control
ESYS	Ignition control for controlling burners
DBI	Direct Burner Ignition
SP	Standing Pilot
BRDG	Device to communicate with Airios RF devices via Modbus (Gateway)
RF PIR Sensor	Radio Frequency Passive Infrared Sensor (motion detector) For example: VMI-02MP03
RF	Radio Frequency
RC	Remote Control
NTC	Negative Temperature Coefficient
BLE	Bluetooth Low-Energy
App	Application for smartphone, tablet or personal computer

1.3 References

Abbreviation	Reference Element	Description
I2C Service Tool	Manual DFGT-03MC18 and I2C servicetool.docx	Manual for configuring the DFGT-03MC18 with the I2C Service Tool PC application

2 System overview

The system is illustrated in Figure 1.

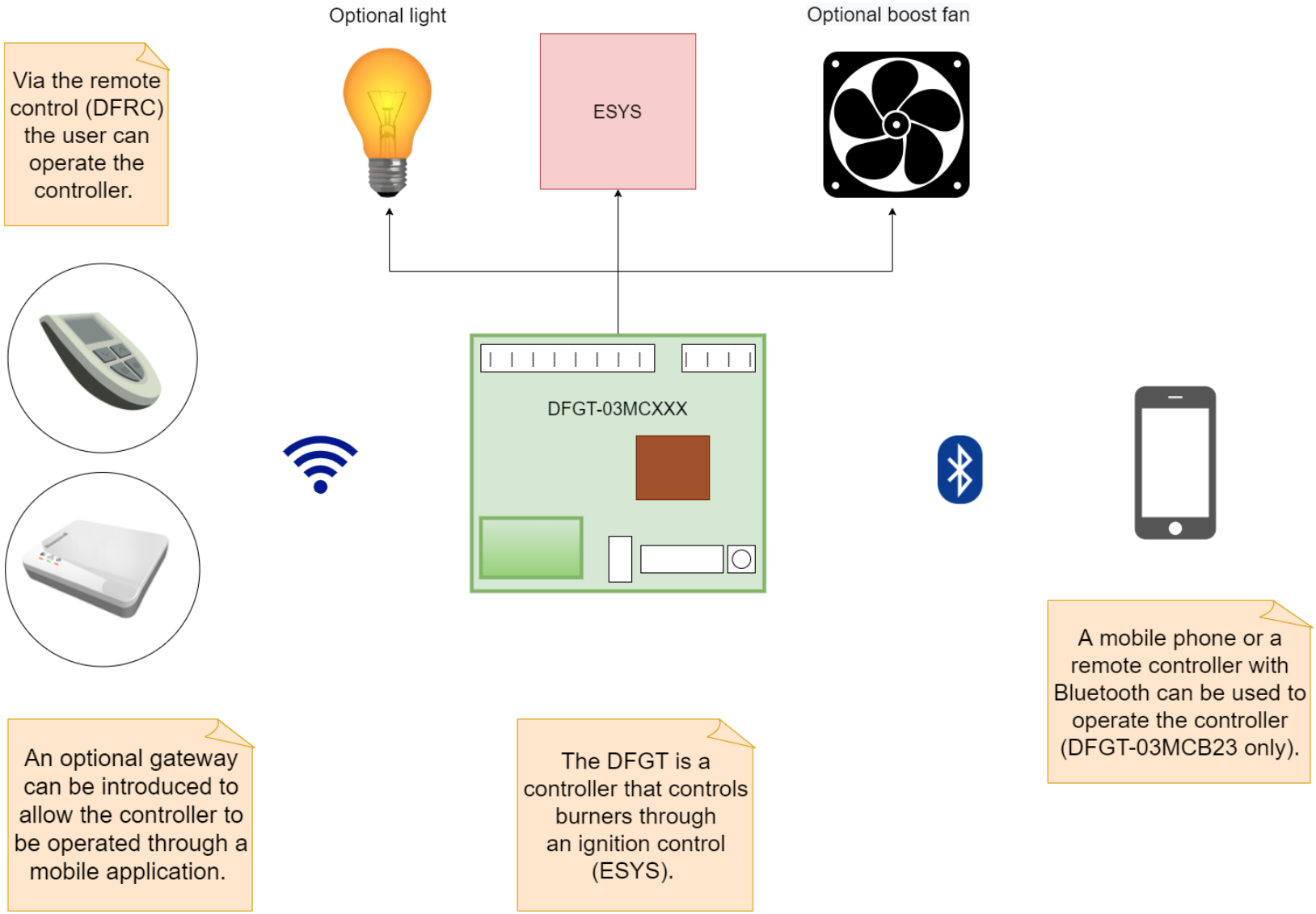


Figure 1. Simplified system overview

3 Wiring

This chapter describes the wiring setup necessary for installing the DFGT in a decorative fireplace.

3.1 Overview connectors

In Figure 2 is illustrated which connectors are accessible from outside the housing of the controller PCB.

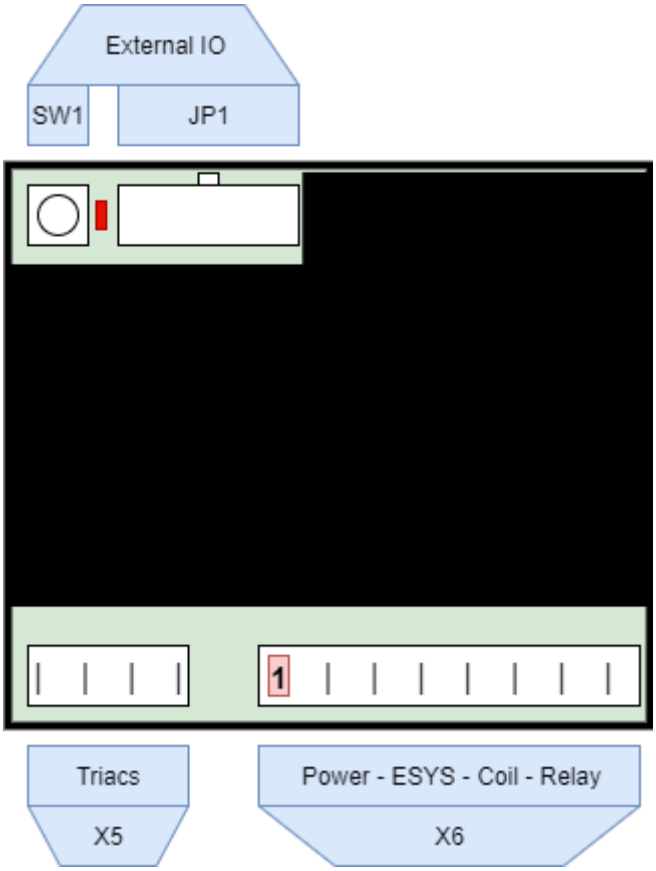


Figure 2. DFGT connectors accessible

3.1.1 Description connections

The connectors shown in Figure 2 are described below.

Connector	Function	Description
X6	Provides: • Configurable relay output • Modulation coil output • ESYS supply output • Power supply input	**Relay:** Output which can be configured for output functionality such as boost or light. See 0. **Coil:** Connect to modulation coil on ESYS **ESYS:** Connect to power supply of ESYS **Power supply:** Connect to mains
X5	Provides Triac outputs	**Triac 1 & 2:** Outputs which can be configured for output functionality such as boost or light. See 0.
JP1	Sensor and communication connections	**I/O 1 to 4:** Inputs and outputs which can be configured for input functionality. See Appendix A. **I2C:** Reserved for future use **ESYS-RX/TX:** Connection for communication with ESYS

3.1.2 Detailed description connectors

The following paragraphs list the connectors described in paragraph 3.1.

3.1.2.1 X6

Below is the connector X6 illustrated.

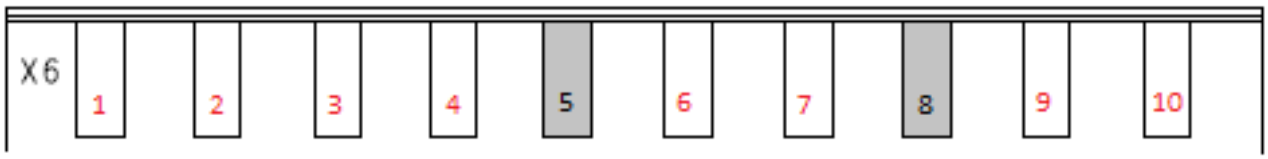


Figure 3. Connector X6

Pin	Function	Description	Note
1	L	Power supply 230VAC	
2	N	Power supply 230VAC	
3	N	Output power 230VAC for ESYS	
4	L Switched	Output power 230VAC for ESYS	2AT fuse
5	NC		
6	Coil +	Output modulation coil PWM output Output current 0-250mA Output voltage >= 15V Frequency	
7	Coil -	Output modulation coil	
8	NC		
9/10	Relay	Potential free switch contact Voltage 230VAC Max. current 1 Ampère	See Appendix B

3.1.2.2 X5

Below is connector X5 illustrated. It is referenced to as triac outputs.

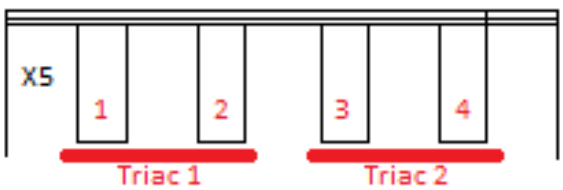


Figure 4. Connector X5

Pin	Function	Description	Note
1	Output Triac	Output Triac 1 Output voltage same as mains voltage Max. output current 0.35A	See Appendix B
2	L	Output Triac 1	
3	L	Output Triac 2	
4	Output Triac	Output Triac 2 Output voltage same as mains voltage Max. output current 0.35A	See Appendix B

3.1.2.3 JP1

Below is connector JP1 illustrated.

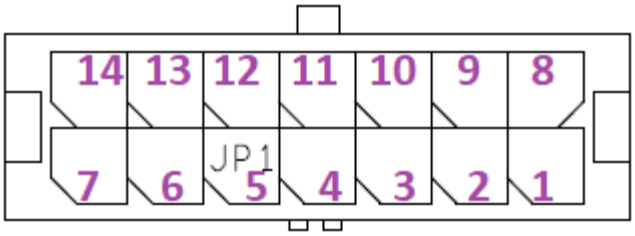


Figure 5. Connector JP1

Pin	Function	Description	Note
1	I2C SCL		Reserved for future use
2	15V	Power output for external devices	
3	I/O 4	Input 4 Switch voltage is 3.3 VDC Switch continuous current is 0.27mA Can be configured as 0-10V input Max input voltage 15V	See Appendix A
4	I/O 3	Input 3 Switch voltage is 3.3 VDC Switch continuous current is 0.27mA NTC type temperature sensors, 10KΩ@25ºC B3435 K	See Appendix A

Pin	Function	Description	Note
5	I/O 2	Input 2 Switch voltage is 3.3 VDC Switch continuous current is 0.27mA NTC type temperature sensors, 10KΩ@25ºC B3435 K	See Appendix A
6	ESYS-RX	Communication with ESYS	
7	GND	Ground	
8	I2C SDA		Reserved for future use
9	GND	Ground	
10	GND	Ground	
11	GND	Ground	
12	GND	Ground	
13	I/O 1	Input/Output 1 Switch voltage is 3.3 VDC Switch continuous current is 7.5mA LED current max 6mA	See Appendix A
14	ESYS-TX	Communication with ESYS	

3.2 ESYS wiring

Below is the wiring illustrated between the DFGT and ESYS.

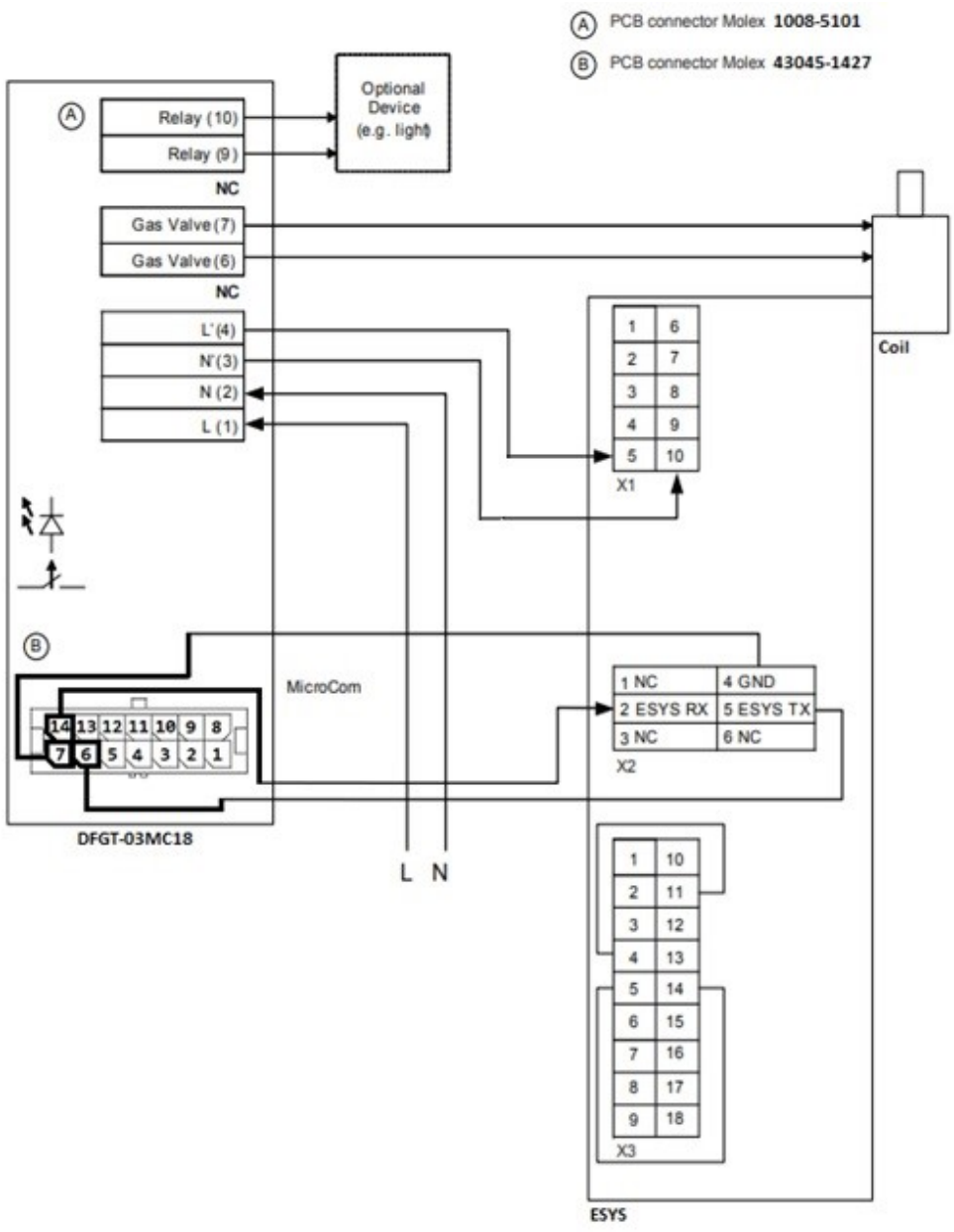


Figure 6. DFGT ESYS wiring

3.3 Ignition and burner configuration

This chapter describes how the ignition of the fireplace can be configured.

3.3.1 Burner settings

The following settings should be configured for the fireplace burner configuration.

Tag	Name	Min	Max	Step	Default	Unit	Remarks
1	Minimum current	45	250	1	45	mA	The current that is needed to set the gas valve in the position according to the required minimum flame height.
2	Maximum current	45	250	1	250	mA	The current that is needed to set the gas valve in the position according to the required maximum flame height.
3	Start current main gas valve	45	250	1	215	mA	The current that is needed to set the gas valve in the ignition position. This current is not limited by the minimum and maximum flame height currents
4	Start current second gas valve	45	250	1	215	mA	The current that is needed to set the gas valve in the ignition position for the second burner. This current is not limited by the minimum and maximum flame height currents
5	Start time main gas valve	0	240	1	30	s	The time it takes to ignite the main burner.
6	Start time second gas valve	0	240	1	10	s	The time it takes to ignite the second burner.
7	Max Time Ignite State	60	240	1	240	s	After ignition, a flame must be detected within the set time. If not, the gas valve will be closed and there will be an error indication on both the user interface of the DFGT and the Remote Control of the decorative fire. The user has to ignite the decorative fire again. The value must be chosen in such a way that the time is sufficient for fireplace to run a complete start cyclus

Tag	Name	Min	Max	Step	Default	Unit	Remarks
8	Post purge time	0	255	1	2	s	The delay time between the switching off and the re-ignition of the decorative fire. The time must be choosen in such a way that the time is sufficiënt for the decorative fire to cool down enough.
22	Open closed	0	255	1	255	-	**0** – Open fireplace **1** – Closed fireplace **255** – Not configured Should be set to 0 or 1 **after** product is configured (settings above)

3.3.2 Ignition type

The DFGT supports two types of ignitions with the ESYS module. These are described in the following paragraphs.

3.3.2.1 Direct Burner Ignition (DBI)

With direct burner ignition, no pilot flame is available. The main burner can be ignited directly. After a configurable time, the second burner can be ignited. The DFGT offers an option to automatically ignite the second burner when the main burner was ignited, and time has elapsed.

This functionality is configurable through the following settings:

Tag	Name	Min	Max	Step	Default	Unit	Remarks
20	Secondary burner available	0	1	1	0	-	For second burner available set to ‘1’
21	Standing pilot available	0	1	1	0	-	For DBI application or Intermittent Pilot operation set to ‘**0**’
23	Enable secondary burner on when main burner on	0	1	1	0	-	0 – On ignition only main is switched on 1 – On ignition main and second are switch on in sequence 2 – On ignition main and second are ignited (even if second is not switched on)

3.3.2.2 Standing pilot (SP)

When a pilot flame is available, the standing pilot setting should be configured. This allows ignition of the main burner through the pilot flame. The pilot flame itself can also be controlled to be on or off. A secondary burner can also be configured.

Tag	Name	Min	Max	Step	Default	Unit	Remarks
20	Secondary burner available	0	1	1	0	-	For second burner available set to '1'
21	Standing pilot available	0	1	1	0	-	For SP application set to '**1**'
23	Enable secondary burner on when main burner on	0	1	1	0	-	0 – On ignition only main is switched on 1 – On ignition main and second are switch on in sequence 2 – On ignition main and second are ignited (even if second is not switched on)

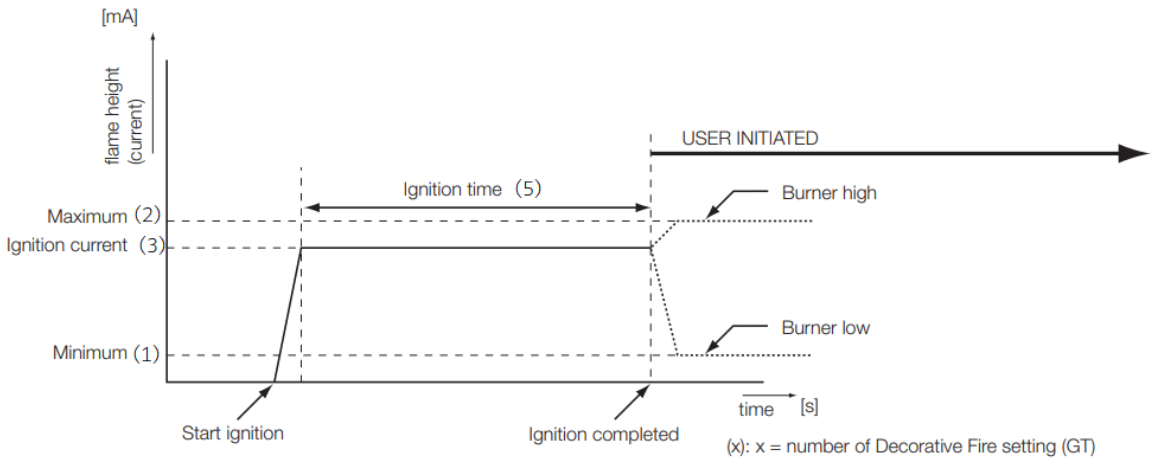


Figure 7: Ignition sequence one burner

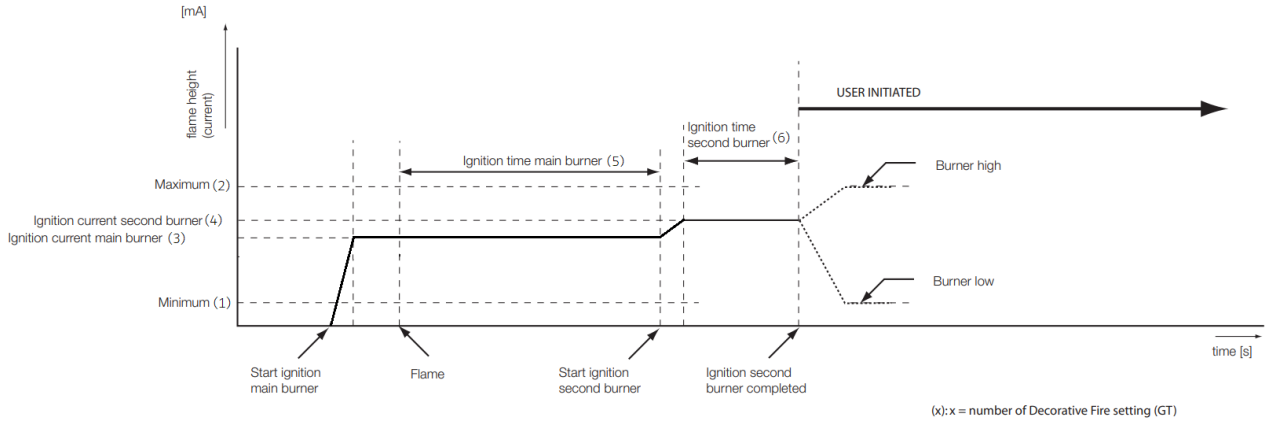


Figure 8: Ignition sequence two burners; second burner ignited when main burner is on

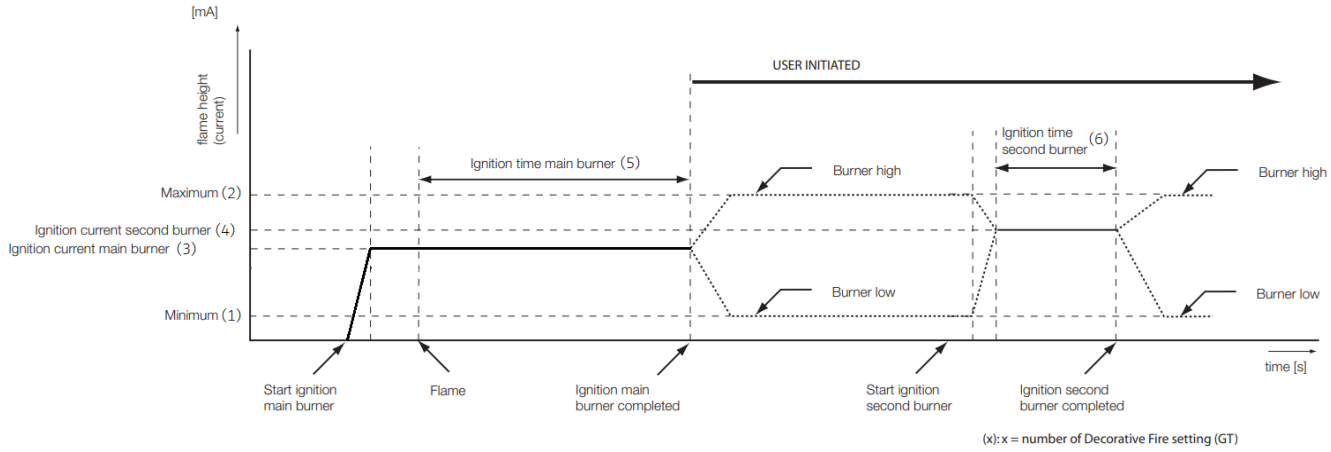


Figure 9: Ignition sequence two burners; second burner is separately ignited. Flame height

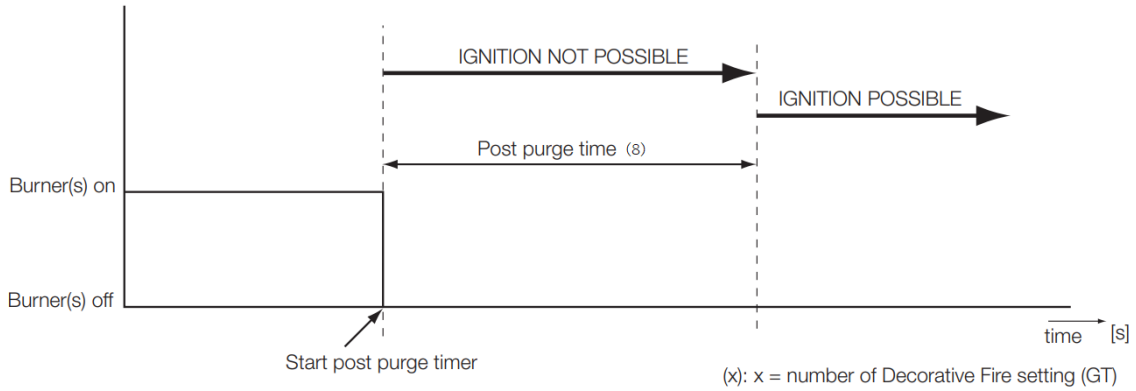


Figure 10: Delay time between burner(s) switching off and a new ignition

The flame height can be adjusted during normal use. The adjustment of the flame is limited between a minimum and maximum value. These minimum and maximum flame height values are set at the factory (see settings). The relation between the pressure and the modulation current of the Moduplus White is shown in the figure below.

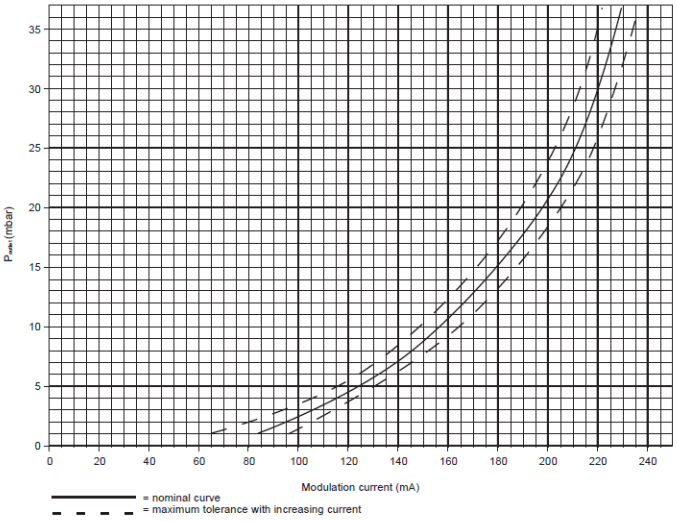


Figure 11: Modulation characteristics of Moduplus White

Notes: The pressure range is 1..37 mbar. Position of the Moduplus is sideward. Modulation current 0..250mA, white coil Inlet pressure 60 mbar. Outlet orifice diameter 4.3 mm

Tag	Name
1	Minimum current
2	Maximum current
3	Start current main gas valve
4	Start current second gas valve
5	Start time main gas valve
6	Start time second gas valve
8	Post purge time

3.4 Second burner

Tag	Name	Min	Max	Step	Default	Unit	Remarks
20	Secondary burner available	0	1	1	0	-	For second burner available set to '1'
23	Enable secondary burner on when main burner on	0	2	1	0	-	0 – On ignition only main is switched on 1 – On ignition main and second are switch on in sequence 2 – On ignition main and second are ignited (even if second is not switched on)

A fireplace can have a second burner next to the main burner.

The second burner can be an extension to the main burner or be placed parallel to create more flames. For this there are some configuration options:

1. Normally only the main burner is ignited when the user ignites the fireplace using the remote or APP (set setting tag 23 to 0)
2. Normally the main and afterwards the second burner is ignited when the user ignites the fireplace (set setting tag 23 to 1). The delay is set with setting tag 6, Start time second gas valve.
3. Normally the main and second burner are ignited simultaneously when the fireplace is ignited. (set setting tag 23 to 2)

4 Control

4.1 Temperature control

Temperature control is not allowed in an open decorative fire.

Tag	Name	Min	Max	Step	Default	Unit	Remarks
22	Open closed	0	255	1	255	-	0 – Open (not allowed) 1 – Closed 255 – Not Configured Should be set to 0 or 1 **after** product is configured (Settings above)
30	Temperature control available	0	1	1	0	-	

Setpoint of temperature control can be set by either the DFRC, Gateway or app (only DFGT-03MCB23).

The measured temperature can be from:

1. Connected NTC sensor. See Appendix A for setting on I/O and par 3.1.1 Description connections for connecting the NTC sensor.
2. DFRC

The DFGT uses its own measured temperature (NTC, connected on I/O2 or I/O3) in case this input (room temp, see setting below)) is selected during configuration and this temperature is valid (0..45°C), otherwise the DFRC temperature is used.

NTC connected to I/O2

Tag	Name	Min	Max	Step	Value	Remarks
42001	Input 2 function	0	19	1	16	Room temp

NTC connected to I/O3

Tag	Name	Min	Max	Step	Value	Remarks
42002	Input 3 function	0	19	1	16	Room temp

4.2 User interface

4.2.1 Push Button

The PCB itself contains the so-called internal push button. An external push button can be connected to the connector terminals (JP1) on the PCB. Both internal and external push button operates in the same way.

The push button has several functions, dependent on the duration of the button press, the state of the Burner Control and the used application (see table 1)

Table 1: Operation of push button related to the duration of the pressed time

Duration	Burner control state	Application	Action
< 1s (short press)	Fault	-	Reset of burner control
< 1s (short press and release button)	No fault	DBI	Off -> On 100% load -> On 0% load -> Off
< 1s (short press and release button)	No fault	DBI + second burner	Off -> On 100% load second on -> On 100% load second off -> On 0% load -> Off
< 1s (short press and release button)	No fault	SP	Off -> On 100% load -> On 0% load -> Pilot on -> Off
< 1s (short press and release button)	No fault	SP + second burner	Off -> On 100% load second on -> On 100% load second off -> On 0% load -> Pilot on -> Off
5 -10s and release button	-	-	RF or BLE binding mode
>10s and release button	-	-	Factory reset
Hold button during power-up			Enable Ramses RF communication. This is not stored in NVM.

4.2.1.1 Factory reset

The following information will be cleared via factory reset:

- BLE bonding information
- RF binding list
- Time schedule switch points
- Roomtemperature setpoint

The following settings will be set to factory default:

- Wave pattern for flame height
- Wave pattern for the light

Tag	Name	Min	Max	Step	Default	Unit	Remarks
55	Person present timeout time	0	480	1	30	min	Time before person present control becomes active

Tag	Name	Min	Max	Step	Default	Unit	Remarks
42021	Min wave height	0	100	1	5	%	For the burner this is the minimal flame height for the wave. This is also applied to the light when configured to follow the **burner wave**
42101	Light wave selection	0	2	1	0	-	0 – Wave for the light disabled 1 – Follow burner wave pattern (in sync with the burner) 2 – Follow light wave pattern
60050	Daylight saving	1	4	1	4	-	1 – None 4 - Europe
60051	Time-zone offset	-840	840	30	60	min	Time-zone offset to UTC in minutes

4.2.2 LED

The PCB itself contains the so-called internal LED. An external LED can be connected to a connector (JP1) on the PCB. The external LED operates the same as the internal LED, with one exception, namely if the push button is pressed, the external LED will be off.

The actual status of the DFGT is indicated by the blinking rate of the LED (see table 2). To visualize the blinking rate more clearly, the same blinking rate is represented by a blinking pattern (see figure 12)

Table 2: Relation between blinking rate and DFGT status

LED indication		Pattern	Status
On Time (ms)	**Off Time (ms)**		
0	Continuous	A	Power not connected or hardware failure
Continuous	0	B	Not configured correctly
100	4900	C	Normal operation (*ESYS OFF*)
1000	4000	D	Normal operation (*ESYS ON*)
100	100	E	No communication with *ESYS*
1000	1000	F	Ignition control failure
800	200	G	No RF communication
100	1900	H	RF Binding mode
100	900	I	Internal failure, like max temperature reached

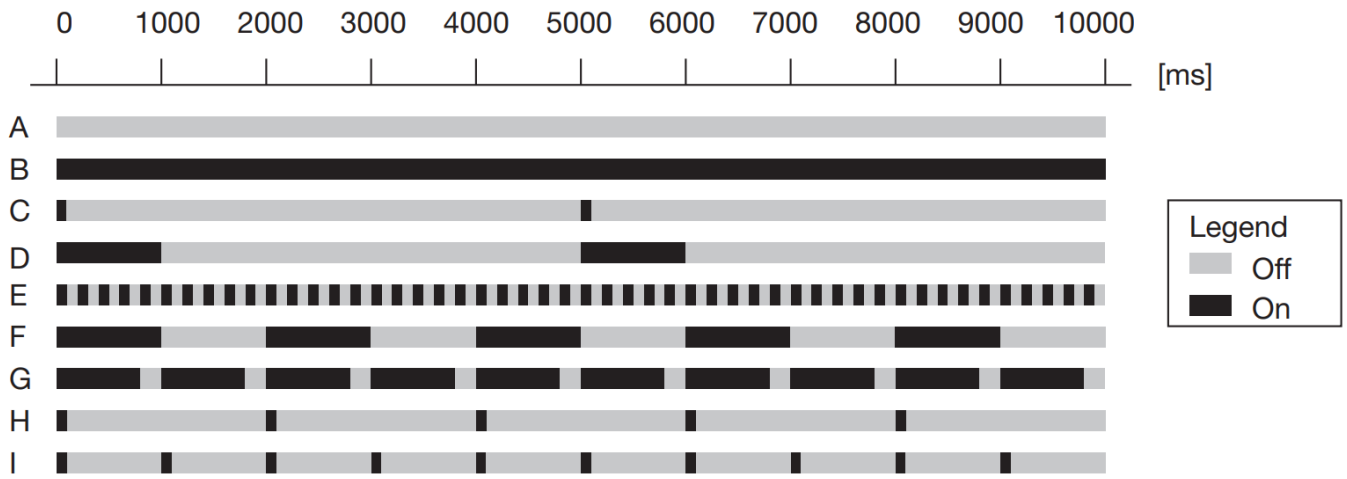


Figure 12: LED blinking pattern according to blinking rate

For connecting external user interface: see Appendix A

4.3 Switch potentiometer (10k)

The potentiometer is used to set the required load (see Figure 13) and has to be connected to connector JP1. To prevent the fireplace from being switched on automatically after a power-up, or a reset, the potentiometer must be switched off first. Once the potentiometer has been switched off, the required load can be set again.

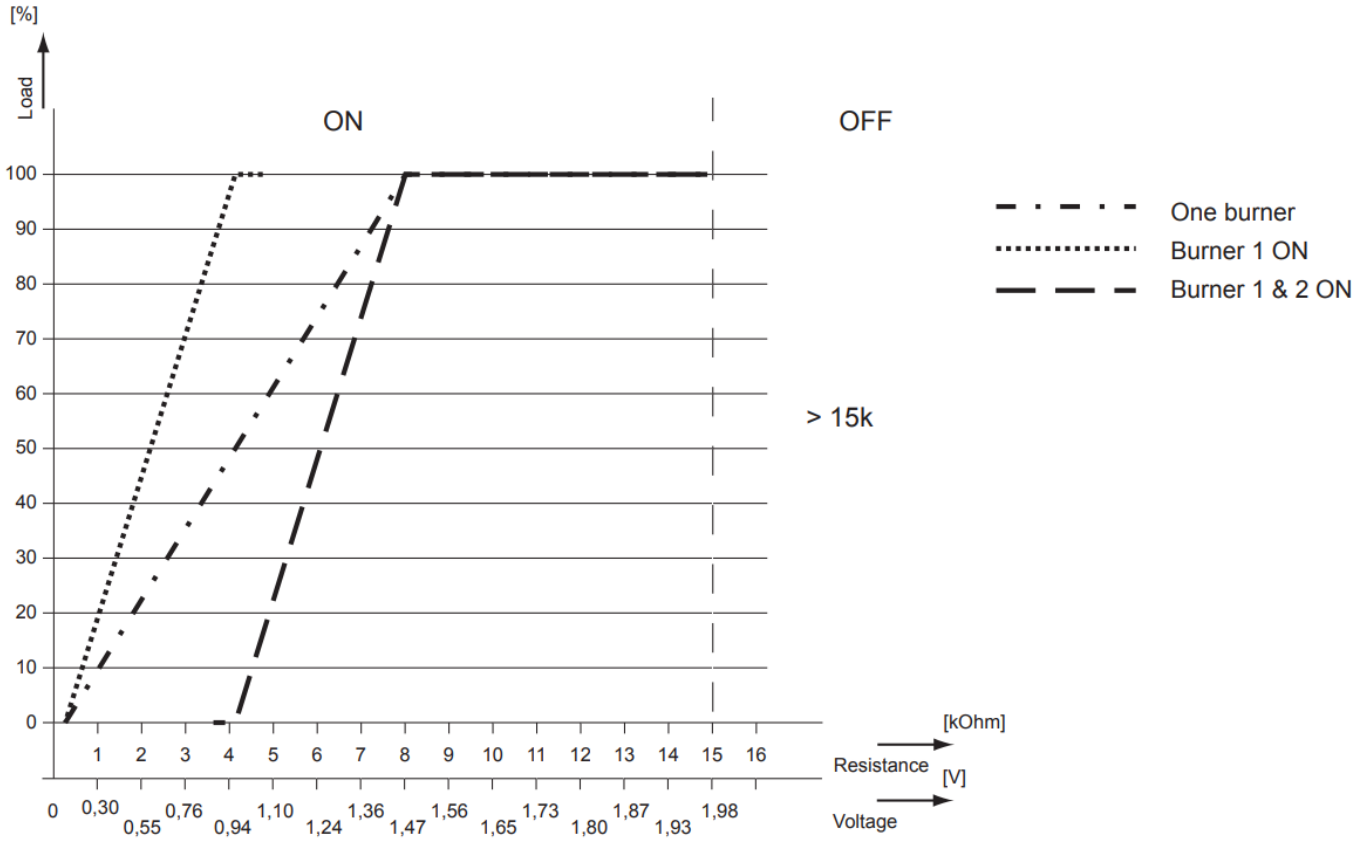


Figure 13: Relation between requested load and resistance of the potentiometer

For connecting external user interface: see Appendix A.

4.4 PIR sensor input

A PIR sensor can be connected, see Appendix A, to control the demand using presence detection. For the time that at least the main burner is on, after a timeout of not noticing a person, the demand is set to 0. Depending on if the system has a pilot flame available, the pilot flame always remains active.

Once the demand was set to 0, only a user action can turn on the burner again. To be able to turn the fireplace back on, person present needs to be detected (someone needs to be in the room) otherwise a fault is triggered.

Note: If the system has an active pilot flame and this fault occurs during igniting, the pilot flame will be turned off.

Besides connecting a wired PIR sensor to the DFGT it is also possible to bind a RF PIR(1). The functionality is the same as the wired PIR except that the timeout of **not** noticing a person is determined by the setting with tag 55 *Person present timeout time* and the time it takes for the RF PIR to **not** detect a person.

The person present control is independent of a current active control. That means that while a current control is active, the person present control becomes active when:

- it is configured as an input or an RF PIR is bound
- the person present control is inactive
- a person is detected first.

The timeout count in minutes is adjustable via the following setting.

Tag	Name	Min	Max	Step	Default	Unit	Remarks
55	Person present timeout time	0	480	1	30	min	Time before person present control becomes active

(1): DFGT-03MC18 or DFGT-03MCB23 configured for Ramses RF

4.5 0 – 10 volt input

The demand for the main and secondary burner can be controlled by supplying 0 to 10 volt to pin 3 (0-10V) and pin 10 (GND) of connector JP1.
To enable this function on I/O 4, the following setting should be set

Tag	Name	Min	Max	Step	Value	Remarks
42003	Input 4 function	0	19	1	14	0-10V Demand based on 0-10V
42003	Input 4 function	0	19	1	19	0-10V limiter, demand based on 0-10V. *Note: Overrides **all** other demands and wave*

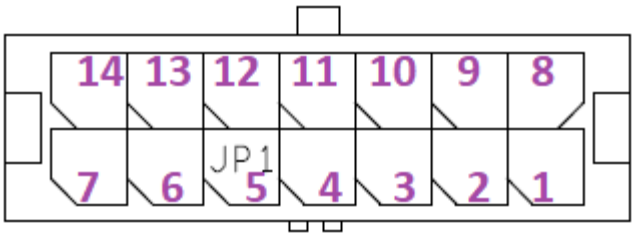


Figure 14. Connector JP1

The main burner is ignited when at least 1 volt is supplied to the configured input. When the 0-10V limiter input function is selected, it will override all other demands from the moment at least 1 volt is supplied. **Only a power-cycle clears this 0-10V demand.**

The linear flame height mapping of 1 – 10 volt depends if second burner is available.

- In case of only main burner available, the main burner is operated by the 1 – 10 volt input. The same range applies when the second burner is available and is configured as an input:
  - 1.0 – 10.0 volt maps flame height from 0 to 100%
- In case of secondary burner available:
  - 1.0 – 5.3 volt maps to 0% to 100% flame height with only main burner on
  - 5.7 – 10.0 volt maps from 0% to 100% flame height with main and second burner on
  - Between 5.3 and 5.7 volt a hysteresis (dead band region) is maintained

When a secondary burner is available, the 0 – 10 volt input demand mapping features a hysteresis for switching between the main and secondary burner. The following constraints are applied for hysteresis:

- When lowering the voltage from above 5.7 volt into the dead band region, the flame height is 0% with the main and secondary burner on
- When raising the voltage from below 5.3 volt into the dead band region, the flame height is 100% with the main burner on

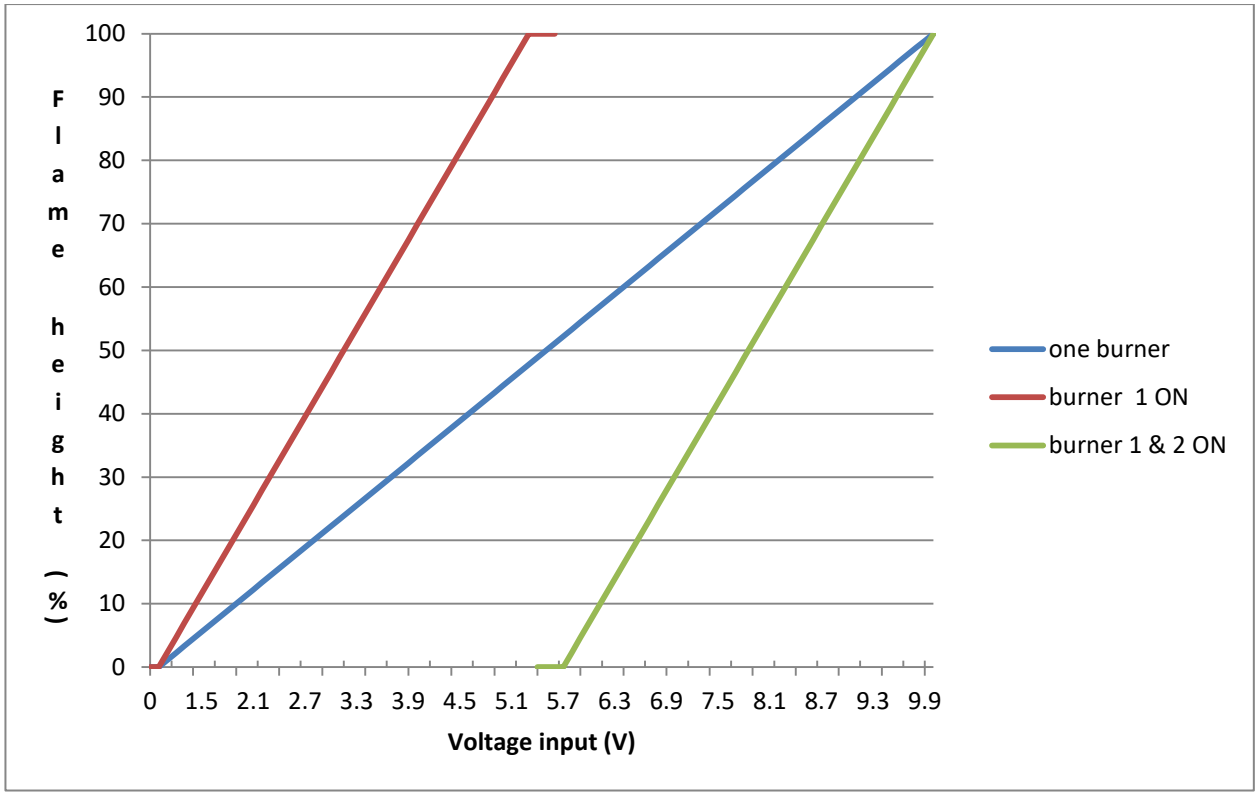


Figure 15 : Relation between 0 – 10 volt input and load demand

Table 3: Table 1: 0 – 10 volt mapping table

Voltage input (V)	Burner request Only main burner available	Flame height (%) Only main burner available	Burner request Second burner available	Flame height (%) Second burner available
0.0	No burner request	0	No burner request	0
0.5		0		0
1.0	Only main burner	0	Only main burner	0
1.5		5.5		11.5
2.0		11.0		23.0
2.5		16.5		34.5
3.0		22.0		46.5
3.5		27.5		58.0
4.0		33.0		69.5
4.5		38.5		81.0
5.0		44.0		93.0
5.3		47.5		100.0
5.5		50.0	Hysteresis	

Voltage input (V)	Burner request Only main burner available	Flame height (%) Only main burner available	Burner request Second burner available	Flame height (%) Second burner available
5.7		52.0	Main and second burner	0.0
6.0		55.5		6.5
6.5		61.0		18.5
7.0		66.5		30.0
7.5		72.0		41.5
8.0		77.5		53.0
8.5		83.0		65.0
9.0		88.5		76.5
9.5		94.0		88.0
10.0		100.0		100.0

5 Boost fan and light option

As illustrated in Figure 1, the DFGT offers an option to control a boost fan or light. These can be configured on the outputs, as described in Appendix B.

5.1 Wiring

The boost fan and light can be connected to the Triac outputs on connector X5, the relay on X6 or the relay output on the ESYS.

When configuring a light or boost fan on a Triac output, it is recommended to configure the output as a modulated output. See Appendix B. This offers the functionality to select levels and follow the boost/light level mapping table. In case of a light, also a wave can be applied.

See paragraph 3.1.2.1 and 3.1.2.2.

5.2 Configuration outputs

To configure the outputs, the following settings can be modified.

Tag	Name	Min	Max	Step	Default	Unit	Remarks
42010	Output Triac 1 function	0	10	1	0	-	See Appendix B. **3** – Boost fan modulated **5** – Light modulated
42011	Output Triac 2 function	0	10	1	0	-	See Appendix B. **3** – Boost fan modulated **5** – Light modulated
42012	Output Relay function	0	10	1	0	-	See Appendix B. **2** – Boost fan **4** – Light
42013	Output ESYS function[(1)]	0	10	1	0	-	See Appendix B. **2** – Boost fan **4** – Light

[(1)]Boost Fan output Esys (triac)

5.3 Enable or disable user control

To enable or disable user control of the boost fan and light. The following two settings can be configured. The settings specify if the light/boost fan are available and their behavior upon ignition of the fireplace.

Tag	Name	Min	Max	Step	Default	Unit	Remarks
42201	Light user configuration	0	4	1	0	-	**0** – Not available **1** – Switch off at ignition **2** – Switch on at ignition **3** – Apply last state at ignition **4** – Available, do nothing at ignition
42202	Boost user configuration	0	4	1	0	-	**0** – Not available **1** – Switch off at ignition **2** – Switch on at ignition **3** – Apply last state at ignition **4** – Available, do nothing at ignition

5.4 Enable level control

When a modulated boost fan or light is configured, it is possible to control it through a number of levels. The following can be configured:

Tag	Name	Min	Max	Step	Default	Unit	Remarks
51	Boost fan available levels	1	15	1	1	-	Number of levels selectable on remote control (DFRC)
52	Light available levels	1	15	1	1	-	Number of levels selectable on remote control (DFRC)

5.5 Mapping tables

During production, a power level conversion table can be made that is used to translate an input percentage (0-100%) chosen by the user, to an actual output percentage to be able to drive the connected light (0-100%).

The output percentage is the output for the Triac (that is configured as modulation light), see Appendix B.

The conversion has 11 entries to map an input percentage to an output percentage. An example table is shown below. For example: a user input of 20% is mapped to a 30% output percentage.

Note: the table only contains the Output levels as column. The user input index value is fixed.

Table 4: Power level conversion table example

User input (%)	Output level (%)
Light is set OFF	**0**
10%	**20**
20%	**30**

User input (%)	Output level (%)
30%	**37**
40%	**44**
50%	**50**
60%	**56**
70%	**63**
80%	**70**
90%	**80**
100%	**100**

An input percentage that does not map exactly to an output percentage is mapped linearly.

For example: a user input of 85%, will be mapped to 75%.

Tables are set via a separate function in I2C service tool (see documentation chapter 4.3) or production tool.

5.6 Boost fan features

The boost fan features settings to specify the control behavior. These are listed below:

Tag	Name	Min	Max	Step	Default	Unit	Remarks
53	Boost fan start delay	0	600	1	0	s	Time after ignition when the boost fan can be controlled
50	Boost fan run-on time	0	600	1	0	s	Time the boost fan stays on after it is turned off

A setting is available to prevent the user from turning the boost fan on or off. The boost fan then follows the burner state.

Tag	Name	Min	Max	Step	Default	Unit	Remarks
54	Boost fan user on/off allowed	0	1	1	1	-	**0** – User is not allowed to turn the boost fan on or off. **1** – User is allowed to control the boost fan independent from the burner state When this setting is '**0**' and the boost fan starts running, it runs on the lowest speed specified in the mapping table (**first entry**) When this setting is '**0**', the boost user configuration is ignored

5.7 Light features

The light offers a feature to follow a user defined wave table. This can be the wave which is applied to the burner(s), or its own defined wave. The following settings are related:

Tag	Name	Min	Max	Step	Default	Unit	Remarks
32	Wave available	0	1	1	0	-	
42020	Wave interval	0	240	1	15	s	This is the interval for which the next entry of the burner wave table is applied. This is also applied to the light when configured to follow the **burner wave**
42021	Min wave height	0	100	1	5	%	For the burner this is the minimal flame height for the wave. This is also applied to the light when configured to follow the **burner wave**
42100	Light wave interval	0	240	1	15	s	When the light follows its own **light wave**, this is the interval for which the next entry of the light wave table is applied
42101	Light wave selection	0	2	1	0	-	**0** – Wave for the light disabled **1** – Follow burner wave pattern (in sync with the burner) **2** – Follow its own light wave pattern
42200	Wave user configuration	0	4	1	0	-	**0** – Not available **1** – Switch off at ignition **2** – Switch on at ignition **3** – Apply last state at ignition **4** – Available, do nothing at ignition

Note: The actual intensity of the light when following the wave is dependent on the selected light level.

Note 2: The actual flame height is dependent on the setting *Min wave height* and selected flame height.

5.7.1 Wave light function control

An additional wave table can be made by setting (during production) the relative light level for number of specific points (maximum 20) and the time interval between these points (only one interval setting, so all intervals are equal).
Therefore, the wave cycle can be between 20 seconds (1*20) and 80 minutes (240*20). There is a smooth transition of light level between the time interval.

The amplitude of the wave for the light depends on the selected light level.
Some examples:

- Blue bars : Wave table for the light, equal to pattern indices values
- Red bars : Light level 90% and activating wave
- Green bars : Light level 50% and activating wave

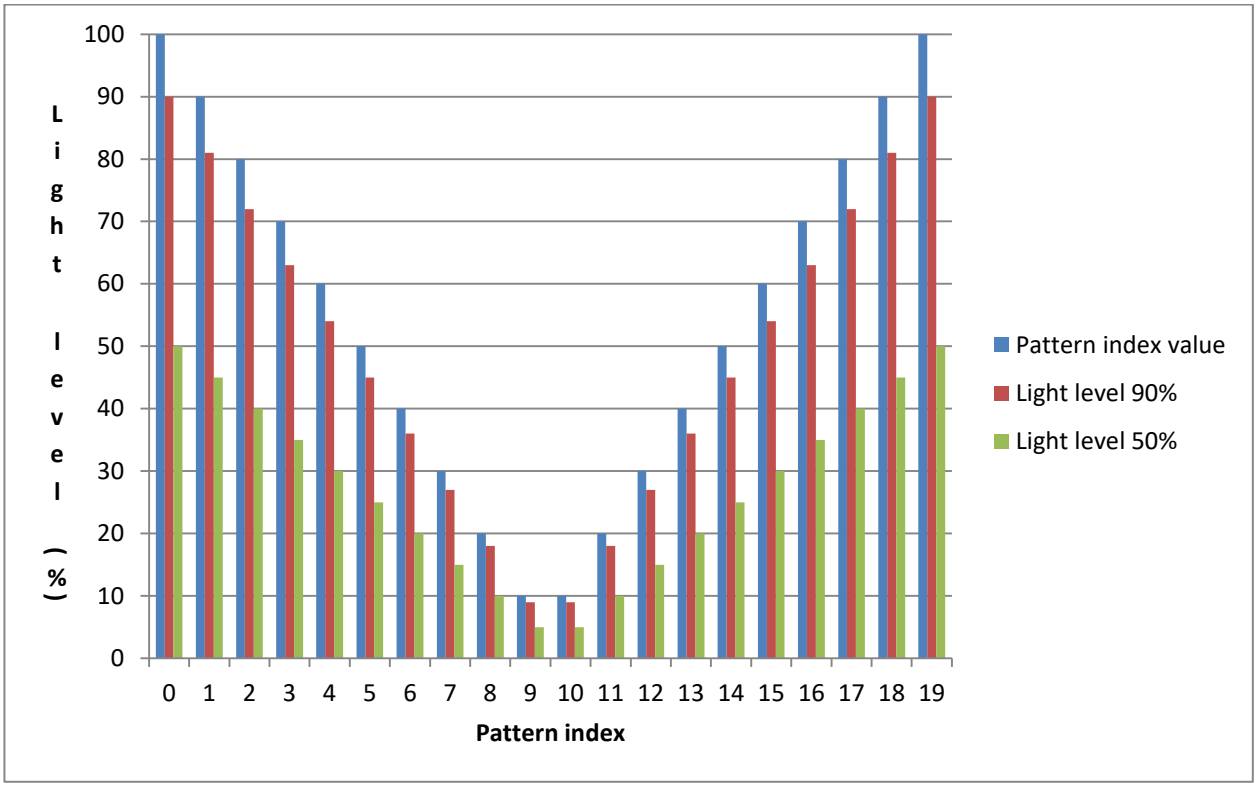


Figure 16: Example 1 of a light wave table

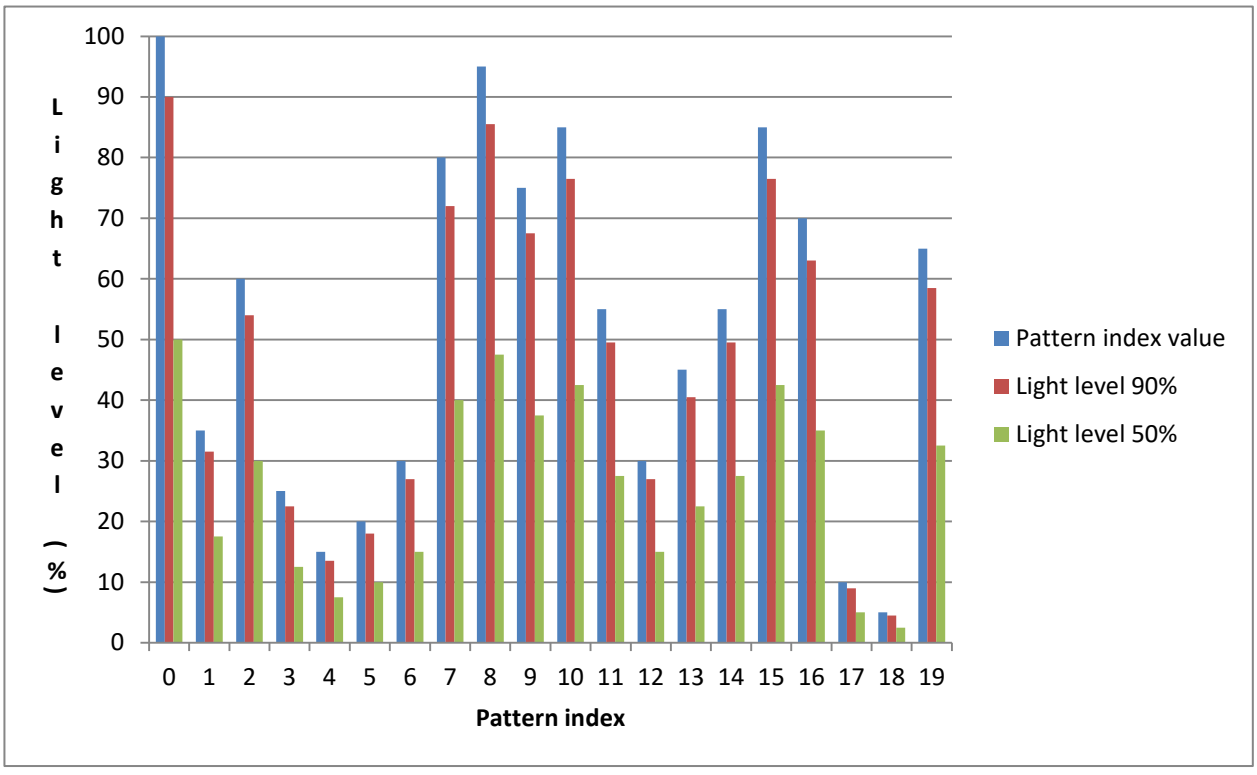


Figure 17: Example 2 of a light wave table

The wave for the light is activated with the *Light wave selection* setting and can be active concurrently with the wave for the flame height when the burner is on.

The light can follow the wave for the flame height instead of its own wave. This can be specified by the setting. The light then uses the same pattern index as the flame height.

The wave for the light can only be applied on outputs configured as ‘light modulated’ (see 0).

5.7.2 LED lamps

Only led lamps that are dimmable can be dimmed. (If a led lamp is dimmable is mentioned on its packaging.)

The following led lamps can be dimmed and are approved to work with the system.

- Philips Master LED candle
- Philips Classic LED luster

6 Wave

The DFGT can vary the flame height according to a wave pattern. The wave pattern can be configured with the Production Tool.

6.1 Wave features

The wave consists of a pattern of maximum 20 intervals each with its own flame height. This pattern is constantly repeated. The pattern starts with the flame height of the first interval. When the interval time expires, the flame height of the next interval is set. When all intervals are handled or the flame height of the next interval equals zero, the pattern is repeated.

The following settings are related:

Tag	Name	Min	Max	Step	Default	Unit	Remarks
32	Wave available	0	1	1	0	-	
42020	Wave interval	0	240	1	15	s	This is the interval for which the next entry of the burner wave table is applied. This is also applied to the light when configured to follow the **burner wave**
42021	Min wave height	0	100	1	5	%	For the burner this is the minimal flame height for the wave. This is also applied to the light when configured to follow the **burner wave**
42200	Wave user configuration	0	4	1	0	-	0 – Not available 1 - Switch off at ignition 2 - Switch on at ignition 3 - Apply last state at ignition 4 - Available, do nothing at ignition

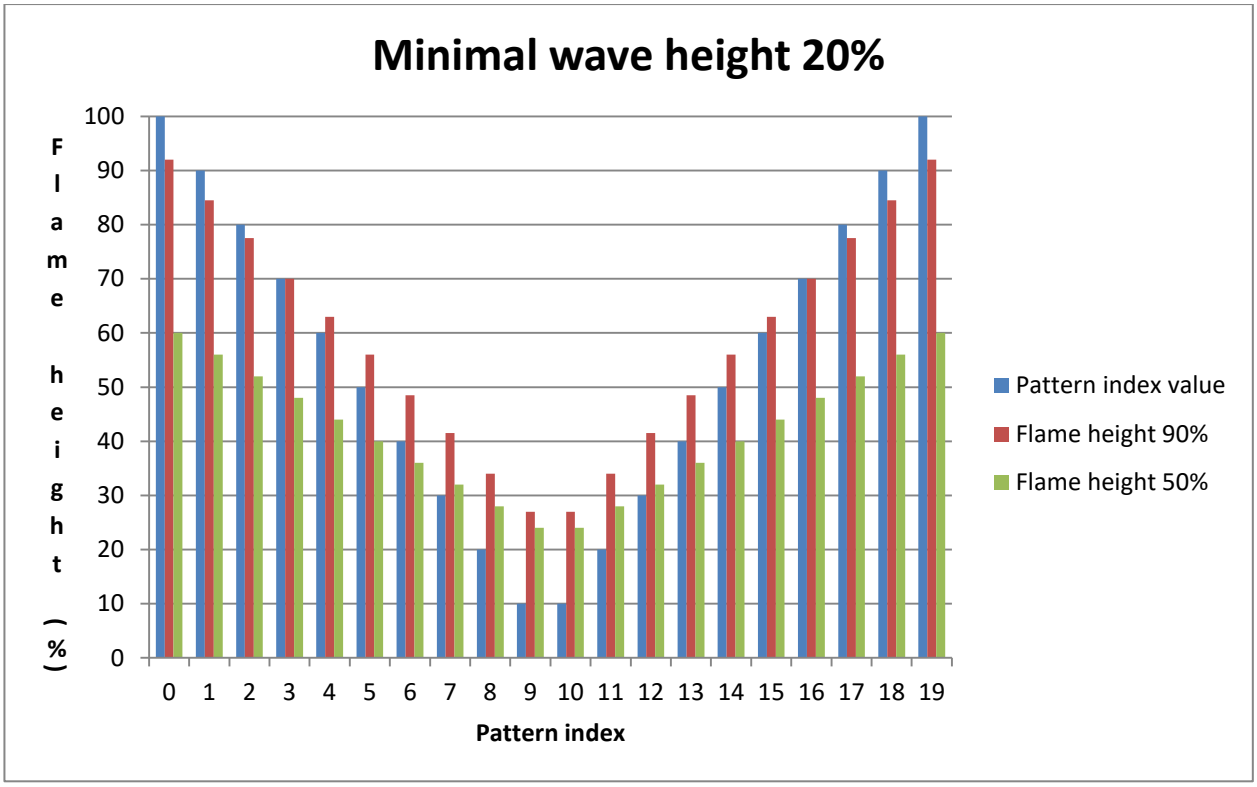
6.2 Wave controls

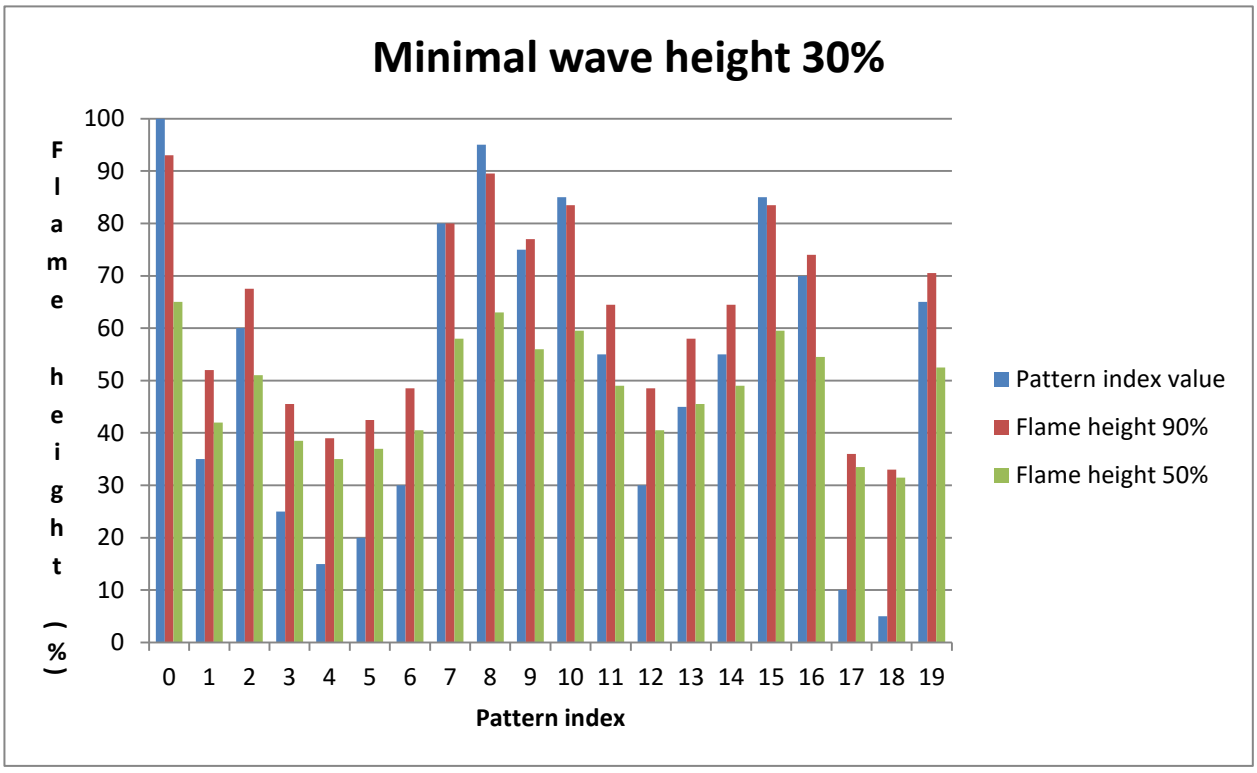
The amplitude of the wave for the burner(s) depends on:

1. The selected user flame height
2. The factory setting minimum wave flame height

Some examples:

- Blue bars : Wave table, equal to pattern indices values
- Red bars : Demand 90% and activating wave
- Green bars : Demand 50% and activating wave





Notes:

- If the first value of the table is zero wave functionality is not possible.
- The wave is repeated at the end of the cycle.

7 Time schedule

The DFGT features time schedule functionality to run a time program. It supports up to 42 switch points, which can be flexibly configured over a period of one week (7 days).

7.1 Switch points

A switch point specifies the operating mode for the DFGT from a certain moment. A switch point can specify the following parameters:

- The moment within the week it occurs (day, hour and minute)
- Control type (fixed flame height or temperature setpoint)
- Flame height or setpoint for temperature control
- State of the pilot
- State of the secondary burner
- State of the light*
- State of the boost fan*
- State of the wave

*Note: The state of the light and boost fan can only be ON or OFF.

7.2 Enabling

The time schedule can be enabled and disabled by the DFRC, BRDG or BLE device.

7.3 Temporary override

The time schedule can be temporary overridden by the DFRC, BRDG or BLE device by modifying the flame height, burner state or temperature setpoint.

The temporary override is removed when the next switch point occurs or when the schedule is activated again (by either DFRC, BRDG or BLE device).

7.4 Editing

The BRDG and BLE device can edit the time schedule in the DFGT. They can perform the following actions:

- Read a switch point
- Add a switch point
- Change a switch point
- Delete one switch point
- Delete all switch points

7.5 Availability

When person presence detection is configured, the time schedule functionality is disabled.

When there is no BRDG or BLE device and therefore the DFGT has no time schedule. The DFRC can have its own time schedule that is ran by the DFRC. This can be configured through the settings.

When both DFGT and DFRC are configured to have a time schedule available, the DFGT time schedule has priority and is available.

7.6 Settings

The following settings configure the availability of the time schedule in the DFGT.

Tag	Name	Min	Max	Step	Default	Unit	Remarks
31	Clock program available	0	1	1	0	-	Configure if the DFGT has time schedule functionality available
40	Clock program DFRC	0	3	1	0	-	0 - DFRC is not allowed to have its own clock program 1 - DFRC is allowed to have a temperature-controlled clock program 2 - DFRC is allowed to have a flame height clock program 3 - DFRC is allowed to have both clock programs

8 Bluetooth Low-Energy

This chapter describes the BLE features for the DFGT-03MCB23.

8.1 Radio Configuration

The DFGT-03MCB23 can operate with Ramses RF or BLE. Whether Ramses RF or BLE is required can be changed via setting tag 58 *Radio Configuration.* By default, the radio is configured to use Ramses RF.

Tag	Name	Min	Max	Step	Default	Unit	Remarks
58	Radio Configuration	0	1	1	1	-	0 = Radio is configured to utilize Bluetooth Low-Energy 1 = Radio is configured to utilize Ramses RF Note: only DFGT-03MCB23

8.2 Encryption

All communication is encrypted according BLE standard 4.2 or higher.

9 Binding of devices

The DFGT supports binding modes to bind:

- Remote control (DFRC)[1]
- Person presence detector (PIR RF)[1]
- Gateway (BRDG)[1]
- Device or remote control with Bluetooth[2]

The devices have their own way to enable binding mode.

[1]DFGT-03MC18 or DFGT-03MCB23 configured for Ramses RF

[2]DFGT-03MCB23

9.1 Entering binding mode

The DFGT enables binding mode by default after power-up. Binding mode is active for 5 minutes. While binding mode is active, the DFGT works normally. Binding mode can also be entered by pressing and holding the internal or external button for 5 seconds.

9.2 BLE binding

The DFGT-03MCB23 is acting as a peripheral and can be bonded to at least 32 devices. When more devices are trying to bind, the least used device is deleted to prevent that new devices cannot be added. The DFGT-03MCB23 can have at least 4 concurrent links.

After every successful BLE pairing, the pairing window is disabled. To allow another pairing, the pairing window must be reopened.

Additionally, the paired device needs to authorize itself before the application BLE services can be used. The supported authorization levels are:

- User / RC
- Service engineer

The user / RC authorization key is a 16-byte GUID that can be programmed during OEM production. The service authorization 16-byte password can be programmed during OEM production.

10 Mounting

The way the DFGT is mounted, is very important for a correct operation of the DFGT. The DFGT must be mounted in such a way that sufficient cooling of the electronics is possible. Furthermore, the DFGT may not be closed in by metal while this will disturb the transmission of the RF signals. The DFGT has also a clear preference for the direction of the RF signals. This means that the transmission in this direction is much better than in any other direction. It is also very important to keep the ignition cable of the Burner Control away from the DFGT itself and also from the wiring of the DFGT to prevent disturbance of the electronics of the DFGT during the ignition of the burner.

In the real environment, the decorative fire with the DFGT mounted inside, will be almost always build in. This might have a considerable influence on the cooling and on the strength of the RF transmission.

When mounting other parts:
Do not damage or pollute (for instance by drilling or screwing) the DFGT, the Burner Control or the electrical wiring.

The transceiver must always be mounted in such a way that the transceiver is always easily accessible during its lifetime.

10.1 Free Space

The DFGT needs free space for three different purposes:

1. To enable sufficient air flow for the cooling of the electronics
2. To enable the transmission of RF signals
3. To prevent disruption of the electronics by the ignition cable.

10.2 Cooling

Take the following measures to get enough cooling for the electronics in the DFGT:

1. Never cover up the ventilation slots at the top of the DFGT
2. Keep enough space around the DFGT free for ventilation
3. Don’t place the DFGT upside down, with the ventilation slots below

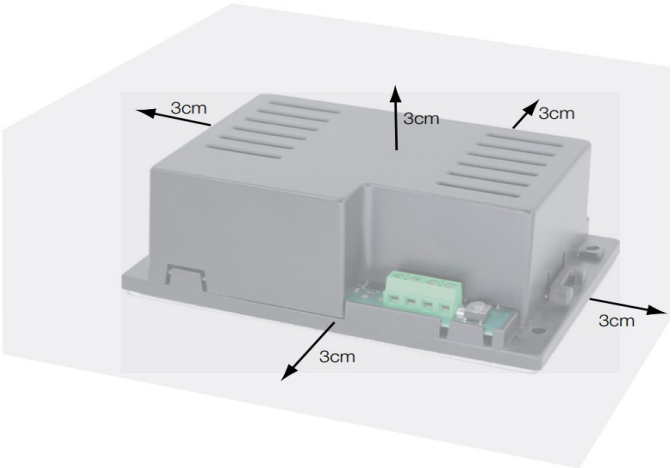


Figure 18: Free space

A free space around the DFGT of at least 3 cm is recommended (see Figure 16).

The ambient temperature of the DFGT and the Burner Control may not exceed 60°C.

When the internal temperature of the unit rises above 60°C the unit goes to *Fault mode*.
Only when the internal temperature of the unit drops below 40°C the unit can leave *Fault mode* by resetting the fault.

10.3 Ignition Cable

To avoid disturbance of the RF communication, it is not allowed to place the ignition cable in the vicinity of the DFGT (see figure 17).

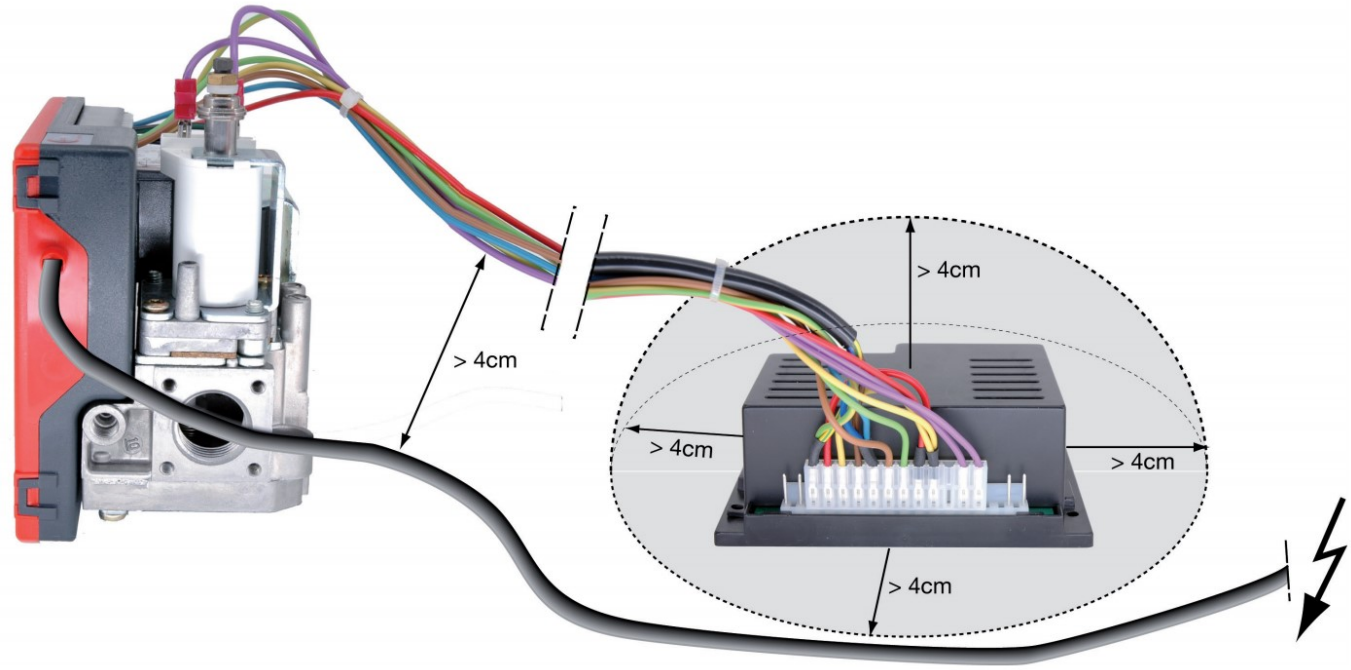


Figure 19: Minimum distance between ignition cable and DFGT

Take the following actions to prevent EMC problems:

1. Keep the ignition cable as short as possible.
2. Prevent ground loops.
3. Make an earth connection as close as possible to the ignition rod.
4. Connect this earth connection directly with the earth connection of the Burner Control by an electrical wire.
5. Also connect this earth connection directly with the earth connection of the Decorative Fire by an electrical wire.

11 RF Transmission

The transmission of RF signals is best if the path of the RF signals is free. Metal objects will completely block the RF signals and therefore cause bad performance.

The position of the Remote Control is not only important when the Remote Control is operated by the user, but also when the Decorative Fire is already on.

The signal strength is visible on the DF-RC and the DF-SE controls.

11.1 Preferred Direction

The RF signal, sent by the DFGT, prefers a certain direction, this means the signal in this direction is the strongest. In Figure 18 this preferred direction is indicated.

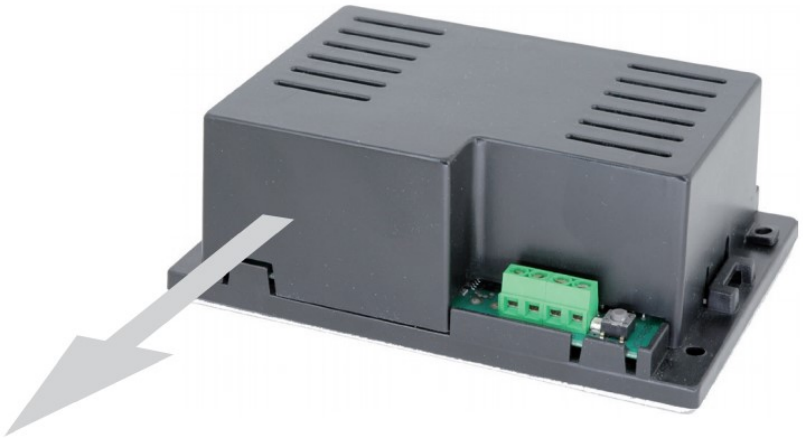


Figure 20: Preferred direction of RF signal

11.2 Influence of Surroundings

Surroundings might have a great impact on the strength of the RF signal, both for sending and receiving. For instance, the RF signal cannot pass through metal, but might also be weakened by other materials. Because the Decorative Fire itself is made of metal, it is very important to create a free path for the RF signal between the DFGT and the Remote Control. Furthermore, there should be no metal objects in the near vicinity of the RF antenna inside the DFGT. Therefore, a metal free space of 10cm around the RF antenna is mandatory (see Figure 19).

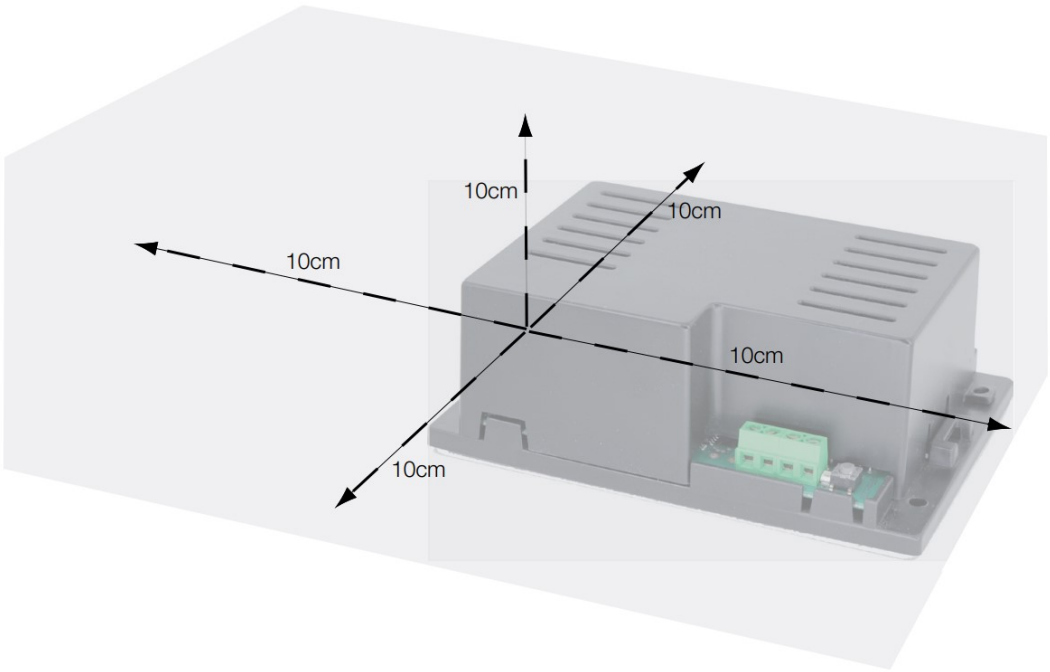


Figure 21: Mandatory metal free space around RF antenna inside the DFGT

The crossing of the arrows in Figure 19 indicates the position of the RF-antenna inside the DFGT.

Figure 20 gives two examples of the influence of the position of the free path in relation with the signal strength. In both examples, the DFGT is positioned in such a way that the preferred direction of the RF signal is to the front of the Decorative Fire. However, in example A there is a free path for the RF signal (no metal) to the front of the Decorative Fire. In example B the free path is located at the side of the Decorative Fire. The differences in the signal strength (RSSI) outside the Decorative Fire are evident. The level at the front of the decorative fire is very good (-40) in example A, but much too low (-90) in example B.

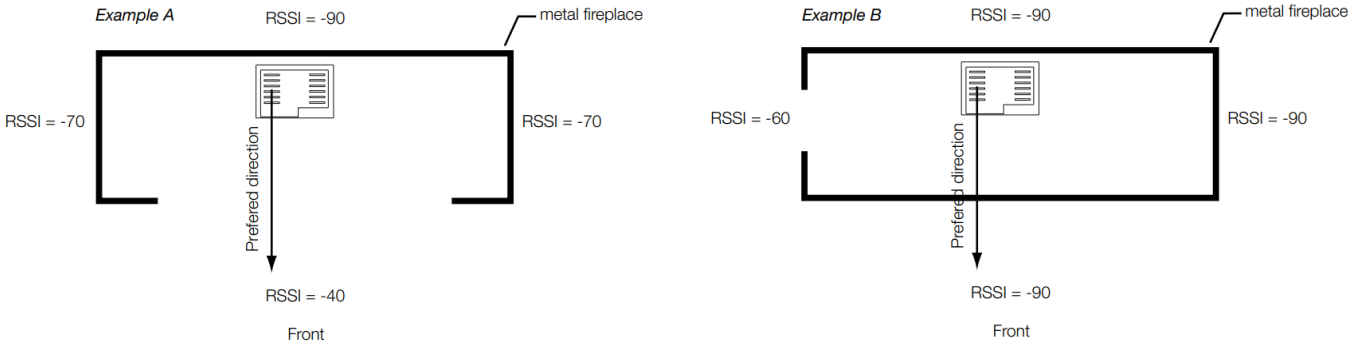


Figure 22: Influence of surroundings on RSSI level

11.3 Guidelines

Assumed is that the Remote Control or BLE device is located at the front of the Decorative Fire (within sight).

To achieve good communication, keep the following in mind:

1. A larger distance between the DFGT and the Remote Control or BLE device will reduce the RSSI-level.

2. Positioning the Remote Control or BLE device further from the preferred direction of the DFGT will reduce the RSSI level.

3. Objects between the DFGT and the Remote Control or BLE device might diminish the RSSI level.

4. Reflections by metal objects will cause high differences in the RSSI-level on places located on very short (centimeters) in-between distances.

5. The RSSI-level as shown on the DFRC is only indicative.

6. A possible difference between the production phase and the actual use. For instance, the Decorative Fire is built in. This could reduce the RSSI level.

7. See to a free path for the RF signal between the DFGT and the Remote Control or BLE device.

11.4 FCC statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.
This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:
Reorient or relocate the receiving antenna.
Increase the separation between the equipment and receiver.
Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
Consult the dealer or an experienced radio/TV technician for help.
To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

12 Diagnostics

To check the overall operating of the DFGT you can use the following aids:

1. Operating counters (readable via service tool, DFRC-SE, BRDG and BLE device)
2. Fault codes (visible on Remote control and readable via service tool DRFC-SE, BRDG and BLE device)
3. Fault counters (readable via service tool DFRC-SE, BRDG and BLE device)
4. Fault history (readable via service tool DFRC-SE, BRDG and BLE device)

12.1 Operating Counters / operating data

The operating counters give information about the general use of the DFGT. The maximum value of each counter is 65535. The actual value of the operating counters can be read by the service tool (DFRC-SE), BRDG and BLE device. Table 5 gives an overview of the available counters and their specific function and contains also operating data.

Table 5: Operation Counters

Tag	Index	Function	Counter Type
F000	1	Pilot	Operation Hours
F001	2	Main Burner	Operation Hours
F002	3	Second Burner	Operation Hours
F003	4	Light	Operation Hours
F004	5	Boost fan	Operation Hours
F005	6	Pilot	Operation Starts
F006	7	Main Burner	Operation Starts
F007	8	Second Burner	Operation Starts
F008	9	Light	Operation Starts
F009	10	Boost Fan	Operation Starts

Table 6 describes operating data of the DFGT, also referred to as actual data.

Table 6: Actual Data

Tag	Data	Unit	Description
E00A	Request pilot	-	0: Request pilot off 1: Request pilot on
E00B	Request main burner	-	0: Request main off 1: Request main on
E00C	Request secondary burner	-	0: Request secondary off 1: Request secondary on
E00D	Flame height	%	

Tag	Data	Unit	Description
E00E	Actual flame height	%	Flame height without limiters
E00F	Burner status	-	0: Off 1: Igniting pilot 2: Igniting main 3: Pilot on 4: Waiting modulation level 5: Main burner on 6: Secondary burner on 7: Post purge
E010	Requested current	mA	
E011	Valve current	mA	
E004	ESYS error	-	
E003	Ionization current	-	Raw measured current from ESYS
E001	Input potentiometer	Ω	
E000	Input 0 – 10v	V	
30C9	Input room temperature	°C	
1290	Input outside temperature	°C	
2309	Room setpoint	°C	
FA80	Raw analog input 0	-	
FA81	Raw analog input 1	-	
FA82	Raw analog input 2	-	
FA83	Raw analog input 3	-	
FA84	Internal temperature	°C	Resolution and accuracy are less 4K
313E	UTC time	s	In seconds since 1-1-1970 If below 2018 it is counting since power-up, at power it starts at 1-1-2000
E012	Time kind	-	0: Not valid (power-up) 1: Valid UTC time
E013	Daylight saving	-	0: Unknown 1: Wintertime 2: Summertime
2E10	Person present	-	0: No person present 1: Person present

12.2 Fault codes

The fault codes can be useful in case of malfunction of the DFGT. Table below contains an overview of all possible fault codes, their cause and possible action to solve the problem. The actual value of the fault (Table 7) can be read by the DFRC, DFRC-SE, BRDG and BLE device. The ESYS fault (Table 7 and 8) can also be read by the DFRC using setting Tag 57.

Tag	Name	Min	Max	Step	Default	Unit	Remarks
57	Display ESYS fault	0	1	1	1	-	0 = ESYS fault is not displayed on DFRC 1 = ESYS fault and fault code are alternately displayed on DFRC in case of a fault

Table 7: Fault Code Description

Tag	Fault code	Fault type	ESYS Fault	Action
F100	1	ESYS communication failure	-	
F101	2	Internal Temperature to high	-	Check if the ventilation slots of the DFGT are not blocked. Check if there is enough free space around the DFGT. Check if there is enough air flow to cool the electronics
F102	3	Wired room sensor NTC fault	-	Check the wiring of the sensor Replace the sensor if needed.
F103	4	Wired outside sensor NTC fault	-	Check the wiring of the sensor Replace the sensor if needed.
F104	5	RF communication timeout with DFRC	-	Check the communication with the remote control. The remote control must be nearby
F105	6	RF communication timeout with BRDG		Check the communication with the BRDG.
F106	7	No flame and no fault feedback from ESYS (timeout on flame)	-	Check the ionization
F107	8	ESYS error and flame not detected	1,2,3,8,27	
F108	9	Disable contact closed (user must manually close contact)	50	Enable contact
F109	10	ESYS error when mode is Pilot on for less than 30 minutes	1,27	

Tag	Fault code	Fault type	ESYS Fault	Action
F10A	11	ESYS error when mode is Pilot on for more than 30 minutes	1,27	
F10B	12	ESYS error when not released	12,13	
F10C	13	ESYS error in On Mode	1,2,27	
F10D	14	ESYS error in Second On Mode	1,27	
F10E	15	ESYS Wiring or gas valve	4, 9, 99	
F10F	16	ESYS internal failure	21,22,25	
F110	17	ESYS unknown failure		
F111	18	ESYS many heat demands	30	
F112	19	RF communication timeout with PIR	-	
F113	20	Person present not detected when igniting	-	

Table 8: ESYS blocking Error Code Description

ESYS Error code	Description	When
1	Ignition Lockout	The number of ignition trials has been elapsed and there was not flame establishment during the safety time.
2	False Flame	There is a flame signal present at a time that there is no flame expected, which is when the gas valves are closed.
3	Safety Cut-off (or High Limit)	The safety cut-off switch opens due to an overheat situation in the application.
27	Flame Lost	There was not flame establishment during the safety time.
8	Flame Circuit Error	The self-check of the flame circuit has failed.
9	Valve Drive Circuit Error	The self-check of the valve drive circuit has failed.
12	EEPROM Lockout	Safety EEPROM content check failed.
13	Remote reset lockout	The allowed limit of remote lockout resets per a unit of time is over passed. The volatile lockout which is cleared by turning off and on the board.
21	ADC Error	Internal controller error.
30	Many Heat Demands	Number of heat demands is limited during defined period time, when value is exceeded 3, the error is shown.
99	Wrong wiring	If there is wrong connection.

Table 9: ESYS non-blocking Error Code Description

ESYS Error code	Description	When	Solution
25	Matching Error	Software in micro and EEPROM don't belong to each other.	Control needs to be replaced.
50	Enable Inputs	Switch input to turn-on Domotica inputs closed.	Switch must be open state.
22	Low Main voltage	Trigger voltage less than 150 +/- 10 VAC).	Resolved in 10 seconds when Mains brought back (164-176 VAC).

12.3 Fault counters

Each fault code has his own fault counter. If a fault occurs the according fault is enhanced. This way the total number of times a fault occurred, is known.

12.4 Fault history

This list gives information about recent faults and how many times they occurred and therefore may help to solve a problem. When a new fault occurs, all faults already present in the list are shifted one place to the end and the new fault is stored at the beginning of the list. The fault history list can contain up to 20 faults.

12.5 Additional H.D. counter

ESYS counts situation when is running sparking, safety time is not elapsed and H.D. is end immediately. After Post-purge phase, it's holding in Stand-by and waiting for next H.D. comes from DFGT.

Directly after 4th positive edge (only 3 could be executed) of the heat demand within time “Period H.D. events“ after the first heat demand, the ESYS should go into lockout state where stays for defined time “H.D. over-count delay“.

• The number allowed heat demand is always constant 3 in sw.

• If period timer run out (start with the first heat demand), the heat demand counter should go back to 0.

• If there is a successful ignition, the heat demand counter should go back to 0.

Tag	Name	Min	Max	Step	Default	Unit

Tag	Name	Min	Max	Step	Default	Unit
9	Period heat demand events	0	255	1	120	s
10	Heat demand over count delay	0	255	1	180	s*10

Look at explanation sketch diagram below as well as existing configurable Parameter list description.

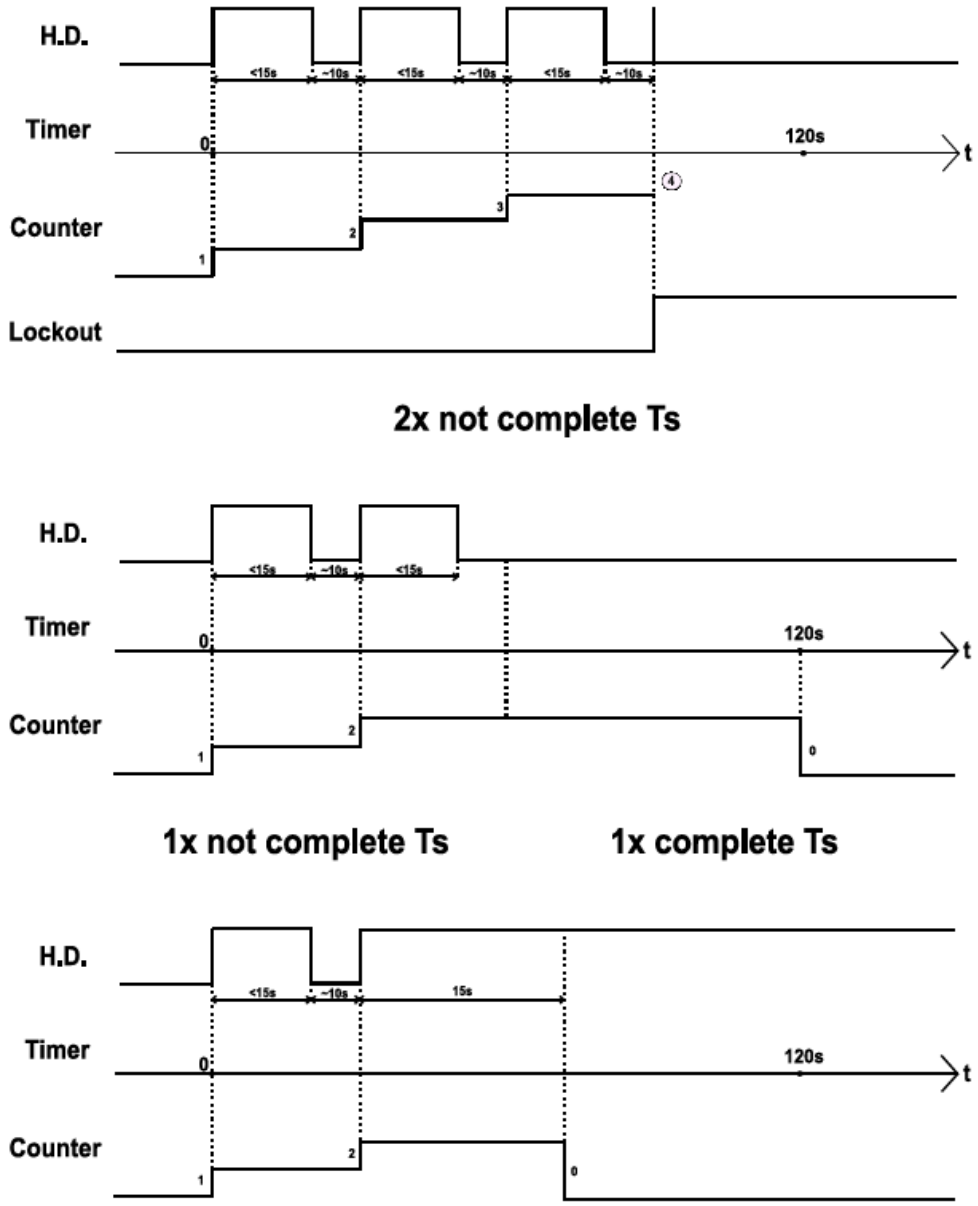


Fig. 5 - H.D. counting mechanism.

13 Safety issues

To reach the highest possible safety level, the following must be taken into consideration:

1. always apply to safety regulations
2. always apply to local regulations
3. don't expose the DFGT to a too high temperature
4. take care of a good communication between the Remote Control and the DFGT
5. take care of a good air ventilation

13.1 24-hour operation (only DFGT-SP)

Due to safety regulations, the CVI is not allowed to release the gas valve for a continuous time longer than 24 hours. To achieve this, the DFGT switches the CVI off (indicated by A in figures) in case:

1. The main burner has been continuously on for 24 hours (see Figure 21)
2. The pilot flame has been continuously on for 24 hours (the on/off state of the main burner is of no importance, see Figure 22).
3. The pilot flame is on, but the main burner has been switched off six hours ago (see Figure 23)

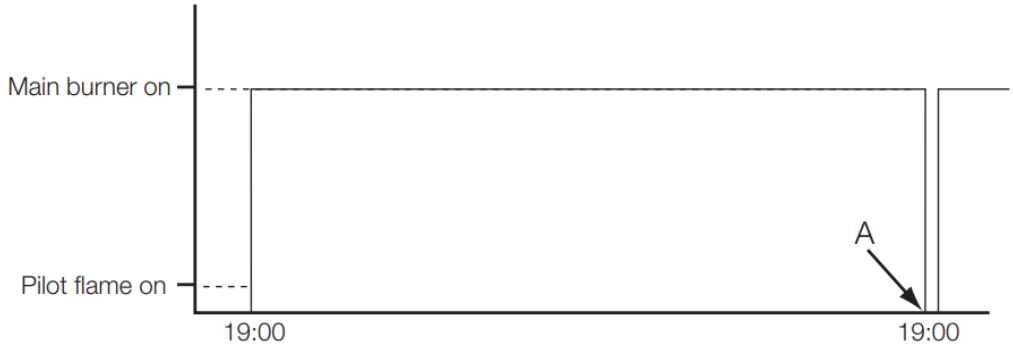


Figure 23: Main burner continuously on for 24 hours

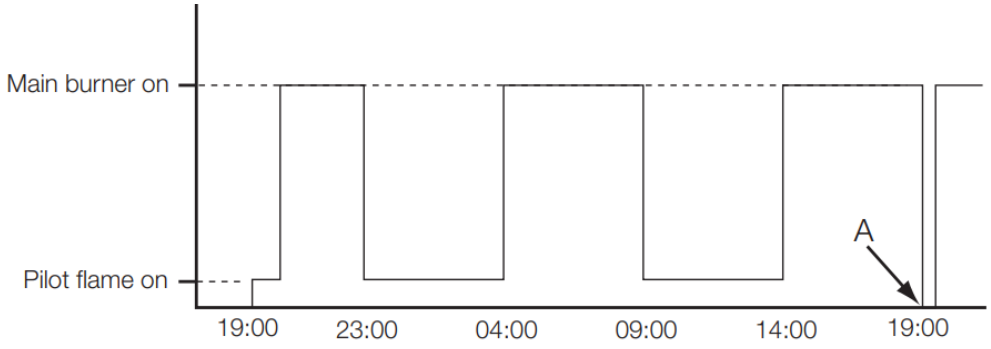


Figure 24: Pilot flame continuously on for 24 hours

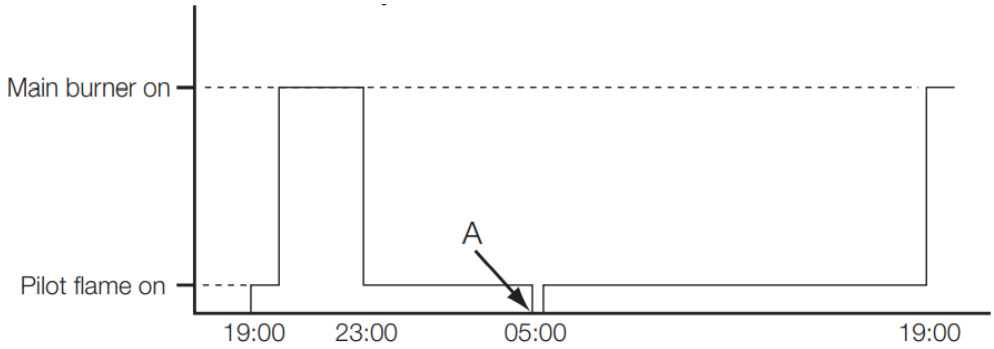


Figure 25: Pilot flame on and main burner switched off 6 hours ago

In case of a closed type fireplace, the CVI will automatically switch the fireplace on again after 5 seconds. In case of an open type fireplace, the user has to switch on the fireplace again.

13.2 Environment temperature

To protect the electronics of the DFGT, the surrounding temperature should not exceed 60 °C. In case the temperature exceeds 60 °C this value, the DFGT will switch off the main burner.

13.3 RF communication

For a correct working of the decorative fire, a good communication between the Remote Control or BLE device and the DFGT is essential. Therefore, the main burner of the decorative fire will be switched off in case the RF communication between RC or BLE device and DFGT is lost for a certain time.

Appendix A Input configuration options

This appendix describes configurable input functions for I/O available on connector JP1.

Function	I/O 1	I/O 2	I/O 3	I/O 4	Description
0) Not used	x	x	x	x	Input has no function (default)
1) Button	x	x	x	x	Function similar to internal button
2) LED	x				Function similar to internal LED
3) Button + LED	x				Function similar to internal button and LED
4) On	x	x	x	x	When connected to ground for more than 1 second the fireplace is turned on [100% load]. Secondary burner is turned on when secondary burner has no configured input. Otherwise, it is controlled by the configured input. When not connected to ground the fireplace is switched off
5) Main burner On	x	x	x	x	When connected to ground for more than 1 second the fireplace is turned on [100% load] When not connected to ground the fireplace is switched off
6) Off	x	x	x	x	When connected to ground the fireplace is permanently OFF When not connected to ground the fireplace can be controlled by any source (future)
7) Higher	x	x	x	x	At the falling edge of a pulse the demand is incremented by 5%
8) Lower	x	x	x	x	At the falling edge of a pulse the demand is decremented by 5%
9) Second Burner	x	x	x	x	When connected to ground 2nd burner is switched on when fireplace is already on
10) Temperature Control	x	x	x	x	When connected to ground the temperature control is activated (future)
11) Light	x	x	x	x	When connected to ground the light is switched ON (future)
12) Boost FAN	x	x	x	x	When connected to ground the boost fan is switched ON (future)
13) Exhaust FAN	x	x	x	x	When connected to ground the Exhaust fan is switched ON (future)
14) 0-10V				x	Demand based on 0-10V signal
15) Potentiometer		x	x		Demand based on potentiometer value
16) Room temp		x	x		Temperature can be used to control Temperature
17) Outside temp		x	x		(Future, no function yet)
18) PIR sensor	x	x	x	x	Used for presence detection. When absence is detected the fireplace turn itself off (pilot on when present) to save gas

Function	I/O 1	I/O 2	I/O 3	I/O 4	Description
19) 0-10V Override				x	Demand based on 0-10V signal. *Note: Overrides **all** other demands and wave*

Appendix B Output configuration options

This appendix describes configurable output functions available on connector X5 (Triacs), X6 (relay) and separate output on ESYS.

Function	Triac1	Triac2	Relay	Esys output[1]	Description
0) Not Used	x	x	x	x	Output has no function (default)
1) Second burner	x	x	x	x	On/Off signal
2) Boost fan	x	x	x	x	Switched On/Off by user
3) Boost fan modulated	x	x			Modulating signal, controlled by user
4) Light	x	x	x	x	Switched On/Off by user
5) Light modulated	x	x			Modulating signal, controlled by user
6) Burner release	x	x	x	x	Active in case burner is (almost) on
7) Main burner release	x	x	x	x	Active in case the main burner is (almost) on
8) Error	x	x	x	x	Active in case there is an error active
9) Hold	x	x	x	x	Active in case the flame height cannot be controlled (same as sent to DFRC)
10) Reset Allowed	x	x	x	x	Active when fault active and fault can be reset (same as sent to DFRC)

[1]Boost Fan output Esys (triac)

Appendix C Settings & factory defaults

This appendix describes the defaults settings of the DFGT

Tag	Index & Name	Min	Max	Step	Default	Unit	Remarks
1	0. Minimum current	45	250	1	45	mA	The current that is needed to set the gas valve in the position according to the required minimum flame height.
2	1. Maximum current	45	250	1	250	mA	The current that is needed to set the gas valve in the position according to the required maximum flame height.
3	2. Start current main gas valve	45	250	1	215	mA	The current that is needed to set the gas valve in the ignition position. This current is not limited by the minimum and maximum flame height currents
4	3. Start current second gas valve	45	250	1	215	mA	The current that is needed to set the gas valve in the ignition position for the second burner. This current is not limited by the minimum and maximum flame height currents
5	4. Start time main gas valve	0	240	1	30	s	The time it takes to ignite the main burner.
6	5. Start time second gas valve	0	240	1	10	s	The time it takes to ignite the second burner.
7	6. Max Time Ignite State	60	240	1	240	s	After ignition, a flame must be detected within the set time. If not, the gas valve will be closed and there will be an error indication on both the user interface of the DFGT and the Remote Control of the decorative fire. The user has to ignite the decorative fire again. The value must be chosen in such a way that the time is sufficient for fireplace to run a complete start cyclus

Tag	Index & Name	Min	Max	Step	Default	Unit	Remarks
8	7. Post purge time	0	255	1	2	s	The delay time between the switching off and the re-ignition of the decorative fire. The time must be choosen in such a way that the time is sufficiënt for the decorative fire to cool down enough.
9	8. Period heat demand events	0	255	1	120	s	For changing setting in esys
10	9. Heat demand over count delay	0	255	1	180	s*10	For changing setting is esys
20	10. Secondary burner available	0	1	1	0	-	For second burner available set to ‘1’
21	11. Standing pilot available	0	1	1	0	-	
22	12. Open closed	0	255	1	255	-	0 - Open 1 – Closed 255 – Not Configured Should be set to 0 or 1 **after** product is configured (Settings above)
23	13. Enable secondary burner on when main burner on	0	2	1	0	-	0 – On ignition only main is switched on 1 – On ignition main and second are switch on in sequence 2 – On ignition main and second are ignited (even if second isn’t switched on)
30	14. Temperature control available	0	1	1	0	-	
31	15. Clock program available	0	1	1	0	-	
32	16. Wave available	0	1	1	0	-	
40	17. Clock program DFRC	0	3	1	0	-	0 - DFRC is not allowed to have own clock program 1 - DFRC is allowed to have temperature controlled clock program 2 - DFRC is allowed to have flame height clock program 3 - DFRC is allowed to have both clock programs
42000	18. Input 1 function	0	19	1	0	-	See Appendix A

Tag	Index & Name	Min	Max	Step	Default	Unit	Remarks
42001	19. Input 2 function	0	19	1	0	-	See Appendix A
42002	20. Input 3 function	0	19	1	0	-	See Appendix A
42003	21. Input 4 function	0	19	1	0	-	See Appendix A
42010	22. Output Triac 1 function	0	10	1	0	-	See Appendix B
42011	23. Output Triac 2 function	0	10	1	0	-	See Appendix B
42012	24. Output Relay function	0	10	1	0	-	See Appendix B
42013	25. Output ESYS function	0	10	1	0	-	See Appendix B
42020	26. Wave Interval	0	240	1	15	s	
42021	27. Min Wave height	0	100	1	5	%	
60050	28. Daylight saving	1	4	1	4	-	1 – None 4 - Europe
60051	29. Time-zone offset	-840	840	30	60	min	Time-zone offset to UTC in minutes
60110	30. NVM Store Directly	0	1	1	0	-	NVM storage is delayed for 2 seconds each time a write operation is requested (up to 30 seconds total). Changing this setting to 1 triggers the NVM storage to resume immediately. After that this setting can be polled, as it will return to 0 once the NVM storage process is completed. Mainly used for production tool
50	31. Boost fan run on time	0	600	1	0	s	Time the boost fan stays on after turning it off
51	32. Boost fan available levels	1	15	1	1	-	Number of available levels that are selectable by the DFRC
52	33. Light available levels	1	15	1	1	-	Number of available levels that are selectable by the DFRC
53	34. Boost fan start delay	0	600	1	0	s	Time after ignition when the boost fan can be controlled

Tag	Index & Name	Min	Max	Step	Default	Unit	Remarks
54	35. Boost fan user on/off allowed	0	1	1	1	-	**0** – User is not allowed to turn the boost fan on or off. **1** – User is allowed to control the boost fan independent from the burner state When this setting is '**0**' and the boost fan starts running, it runs on the lowest speed specified in the mapping table (**first entry**) When this setting is '**0**', the boost user configuration is ignored
42100	36. Light wave interval	0	240	1	15	s	See 5.7.1
42101	37. Light wave selection	0	2	1	0	-	0 – Wave for the light disabled 1 – Follow burner wave pattern (in sync with the burner) 2 – Follow light wave pattern
42200	38. Wave user configuration	0	4	1	0	-	**0** – Not available **1** – Switch off at ignition **2** – Switch on at ignition **3** – Apply last state at ignition **4** – Available, do nothing at ignition
42201	39. Light user configuration	0	4	1	0	-	**0** – Not available **1** – Switch off at ignition **2** – Switch on at ignition **3** – Apply last state at ignition **4** – Available, do nothing at ignition

Tag	Index & Name	Min	Max	Step	Default	Unit	Remarks
42202	40. Boost user configuration	0	4	1	0	-	**0** – Not available **1** – Switch off at ignition **2** – Switch on at ignition **3** – Apply last state at ignition **4** – Available, do nothing at ignition
55	41. Person present timeout time	0	480	1	30	min	Time before person present control becomes active
56	42. Unbind PIR	0	1	1	0	-	Unbind RF PIR. Changing this setting to 1 triggers the removal of the binding immediately. After that this setting can be polled, as it will return to 0 once the removal of the binding is complete.
57	43. Display esys fault	0	1	1	1	-	0 = Esys fault is not displayed on DFRC 1 = Esys fault and fault code are alternately displayed on DFRC in case of a fault
58	44. Radio Configuration	0	1	1	1	-	0 = Radio is configured to utilize Bluetooth Low-Energy 1 = Radio is configured to utilize Ramses RF
59	45. Access level override	-1	5	1	-1	-	Overrides the authorized access level. -1 = No override active 0 = User access level 5 = Service access level