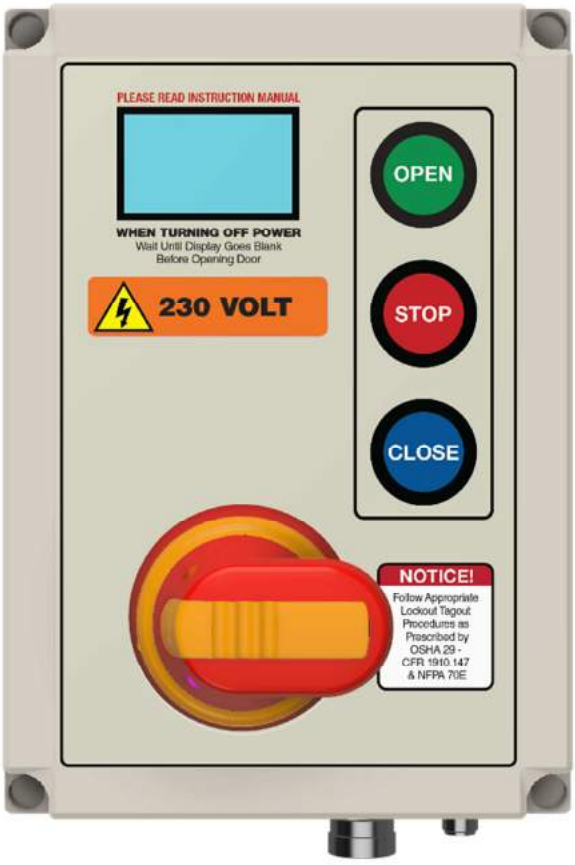
DG-Mini

Universal Door Control



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INTRODUCTION

DESCRIPTION

The DG-Mini door controller has been specifically designed for industrial doors and gates. The controller provides variable motor speed and control as well as monitoring and response to external inputs.

The DG-Mini door controller incorporates a comprehensive range of configurable parameters that allows the door/gate manufacturer and installer to configure for optimal performance.

In addition, live fault diagnostics is provided for the installer and end user allowing for quick resolve of any issues of the system so that the door or gate can continue operation with a minimum of delay.

WHO IS THIS MANUAL INTENDED FOR?

This manual is intended for installers and door and gate manufacturers. It is not intended for the end user.

It is the responsibility of the door and gate manufacturer to supply the end user documentation.

SAFETY WARNINGS

This unit must only be installed by qualified personnel with experience in automatic doors/gates. Knowledge of the relevant regulations is required.

Please read and understand before installation:

WARNING

Depending on location, the installer may have the responsibility for agency approval marking of the door/gate. The installer must inform / advise the end user on how to operate the door/gate.

WARNING

The DG-Mini is developed to comply with the requirements of UL 325 and EN 13241-1. It is listed under UL 508C and UR 325.

WARNING

All field installed components must be UL/CE approved to allow a final UL/CE marking of the complete installation.

WARNING

An entrapment protection device that complies with UL 325/ EN 12978 must only be connected to the dedicated entrapment protection terminals. These inputs are of Safety Class II and are internally supervised for the correct function during operation.

WARNING

The cable between the motor and control must be shielded and connected as shown in this manual.

WARNING

Do not mount the controller in direct sunlight or other sources of heat as this may cause the controller to overheat.

WARNING

There are no user- serviceable parts inside the DG-Mini. Repairs can only be done by BTR Controls Inc.

WARNING

Disconnect mains supply and follow all appropriate lock-out tag procedures when installing or servicing the controller.

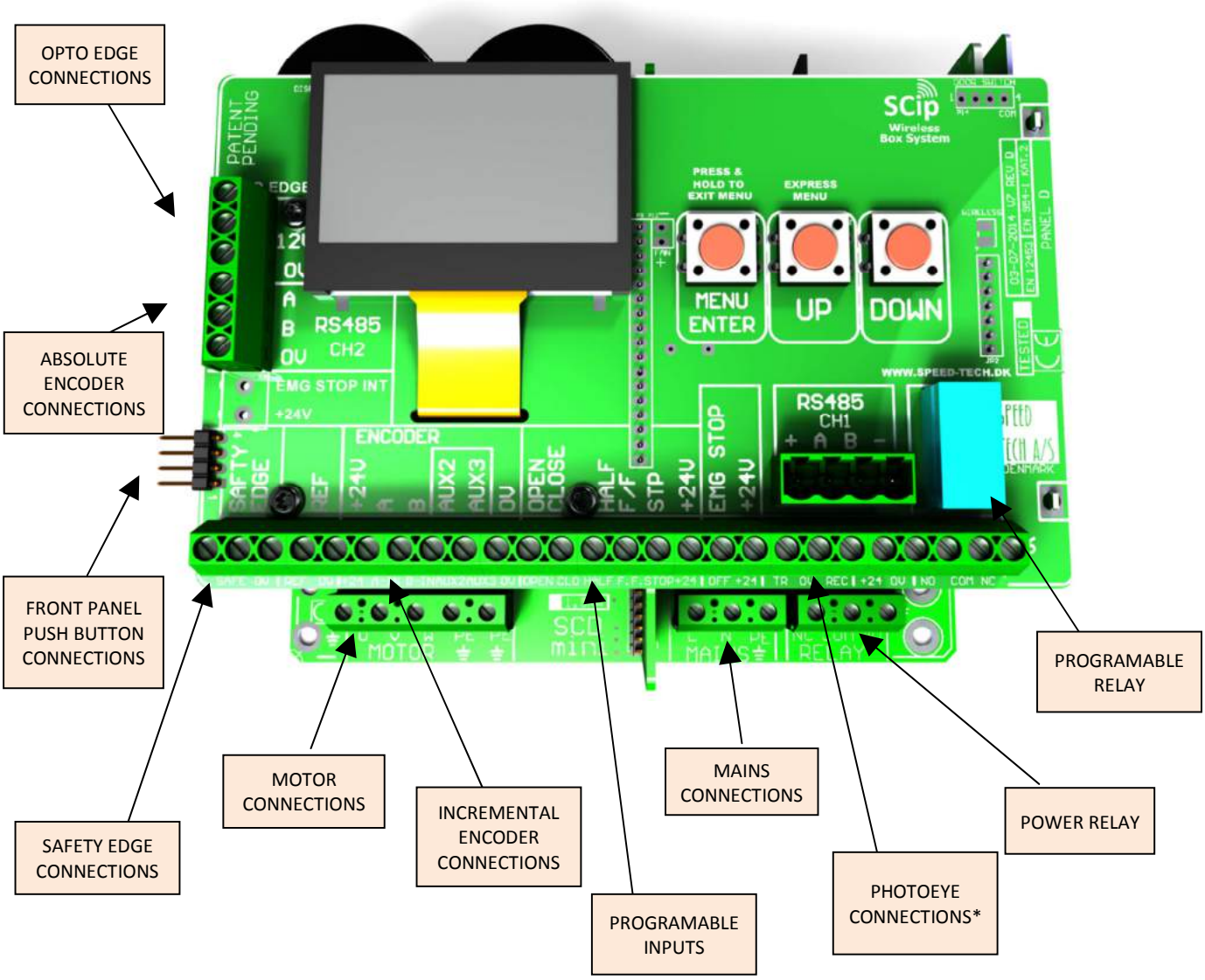
WARNING

Terminals may contain high voltages up to 5 minutes after disconnecting the mains supply.

WARNING

The door/gate may operate automatically without warning, therefore a light or siren may be required.

CONTROLLER OVERVIEW



NOTE

Photoeyes may be connected to different terminals based on the type of photoeye.

BASIC WIRING

WARNING!
ELECTRICAL HAZARD!

Always disconnect mains supply before servicing the high voltage connections of the motor or the door controller.

WIRING SPECIFICATION

Terminal Block Specifications			
	Max Wire Size	Min. Wire Size	Torque
Power	12 AWG	28 AWG	0.5 – 0.6 Nm (4.4 – 5.3 lb-in)
Control	12 AWG	28 AWG	0.5 – 0.6 Nm (4.4 – 5.3 lb-in)

Wiring Specifications	
Item	Specification
Power	Unshielded 12 AWG, 600V, 75C or 90C THHN/THWN or equivalent
Motor	Shielded 14 AWG, 600V, 75C or 90C RHH/RHW-2 (VFD rated cable required)
Control	Unshielded 16 AWG, 600V, 75C or 90C THHN/THWN or equivalent
Communication	22AWG (0.8mm2) twisted pair, 100% shield with drain

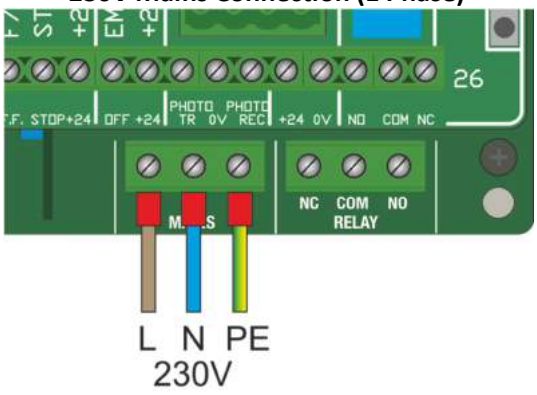
MAINS CONNECTION

CAUTION

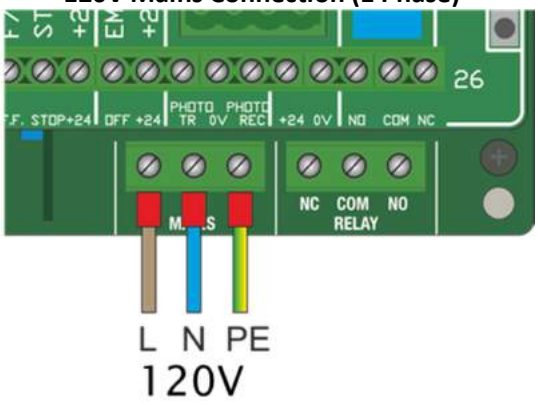
To comply with EN61000 please use mains filter part number: B 1309105 made by BLOCK.

For further information please visit www.block.eu

230V Mains Connection (1 Phase)



120V Mains Connection (1 Phase)



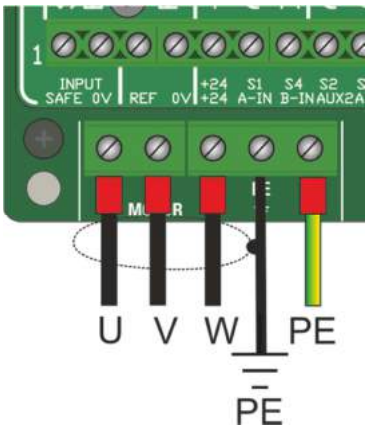
WARNING

Grounding of the mains supply is essential to safety of personnel as well as the operation of the DG-Mini controller.

A floating or ungrounded mains supply can create a hazardarous condition or permantely damage the controller.

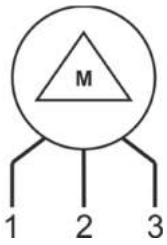
If the service transformer cannot be grounded an isolation transformer with a grounded secondary is required.

MOTOR CONNECTION

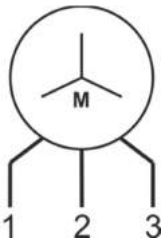


Single speed dual winding (delta/ wye) motor example

230V
3PH DELTA

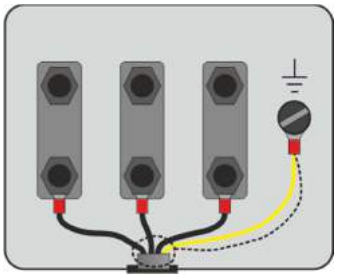


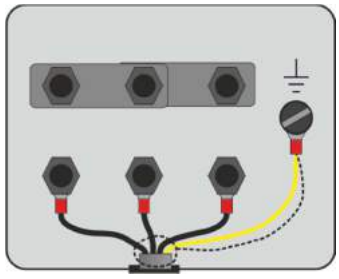
460V
3PH STAR



WARNING

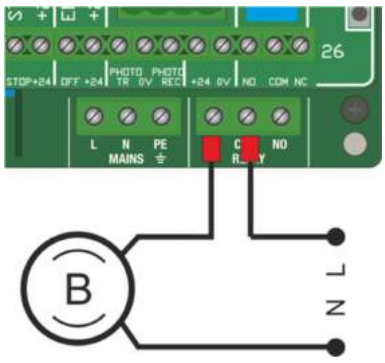
A shielded cable must be used to connect the motor to the controller. Connect both the ground and shield wires to the chassis on the motor side. Also connect both the ground and shield wires to PE terminals on the controller.





MOTOR BRAKE

Some door applications require that the motor is mounted with an electromechanical brake that restrains the motor while not running. The example shown uses the power relay to control an AC motor brake.



NOTE

Set the power relay to 'Door Moving' by using the menu: ***System Config ▸ Outputs ▸ Power Relay.***
This setting will activate the power relay activate when the door is moving.

ENCODER

It is possible to connect either a digital absolute encoder or an incremental encoder to the DG-Mini controller, however only one type may be used at a time.

CAUTION!

Care must be taken when connecting an encoder to the DG-Mini as digital absolute encoders are connected to different terminals than incremental encoders.

NOTE

Set the type of encoder using the menu:
System Config ▸ Position Sensor ▸ Type

NOTE

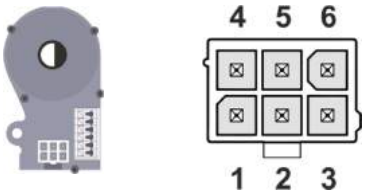
The system performance depends on the feedback signal from the motor. Absolute encoders without pulse output do not react as fast as incremental encoders.

Encoders Compatible with the DG-Mini

BTR

MIG Incremental

Kostal / GFA / MFZ



Connection table for encoders:

Encoder type:		**DG-Mini terminals:**							
Name:	**Type:**	**5** (+24V)	**6**(A)	**7**(B)	**10**(0V)	**28**(+12V)	**30**(A)	**31**(B)	**32**(0V)
MIG	Incremental*	**Brown**	**Yellow**	**Green**	**White**				
BTR	Absolute		**Black**			**Brown**	**Gray**	**White**	**Blue**
Kostal / MFZ / GFA	Absolute					+12V	RS485A	RS485B	0V
						Pin 6	Pin 4	Pin 2	Pin 3

* A reference run is necessary – see the Reference section for more details.

REFERENCE LIMIT

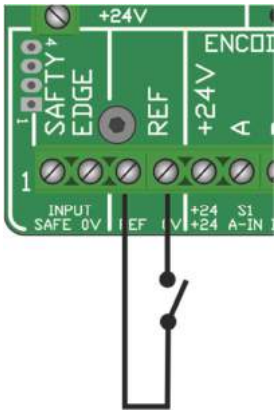
When using an incremental encoder, the controller does not know the position of the door when power is applied. Therefore a reference switch at a known location is required. At start up a reference run is necessary to properly determine the door's relative position.

The reference switch must change state only once during the complete travel of the door. A reference switch mounted at the open position must be a normally open switch. A reference switch mounted at the closed position must be a normally closed switch. The controller uses the state of the switch to determine the direction the door is to travel during the reference run.

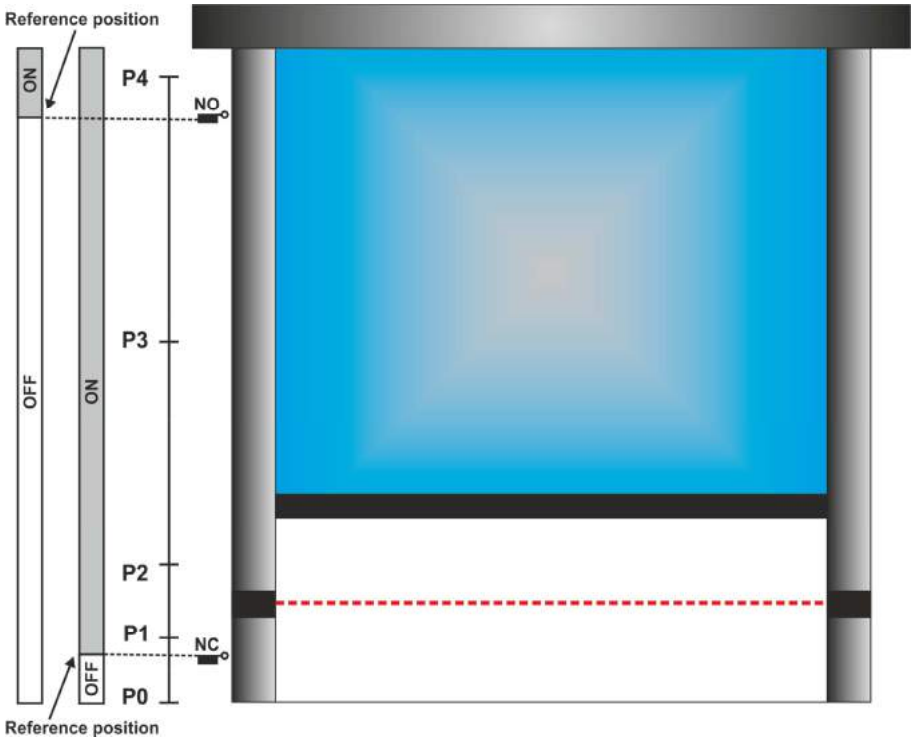
The illustration below shows the possible locations and states for the reference switch.

NOTE

Remember to select the correct switch type based on its mounting location using the menu:
System Config ▸ Reference.



Reference Limit Switch Connection

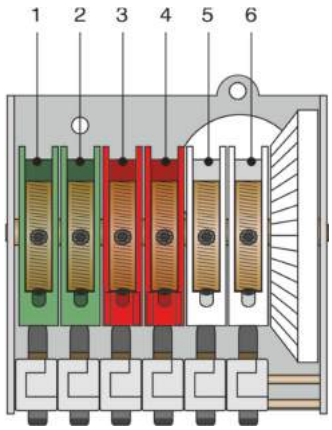


LIMIT SWITCHES

The DG-Mini controller can also support mechanical limit switches.
The minimum requirement is two switches, four are preferable.

NOTE

Limit switches are not a standard feature, consult BTR Controls Inc. for details.



Switch No.:		DG Mini terminal:	Description:
1	▸	9	Pre-Open limit switch
2	▸	7	Open limit switch
3	▸		Open safety limit switch
4	▸		Close safety limit switch
5	▸	6	Close limit switch
6	▸	8	Pre-close limit switch (Reference)

NOTE

Use the +24V output at terminal 5 for common supply

SAFETY EDGES

The DG-Mini supports multiple types of Safety Edges connections. Connection details and programming details are illustrated below.

WARNING

It is essential that a UL 325 compliant entrapment protection device be used in conjunction with the DG-Mini.
If the entrapment proection is a safety edge, only use the dedicated safety edge inputs on terminals 1 and 27.

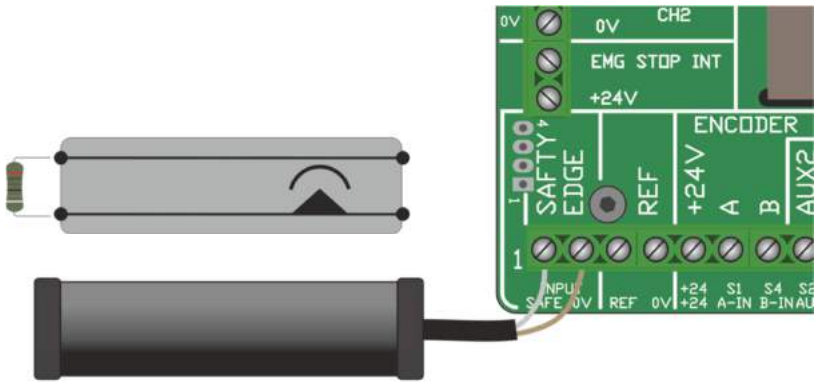
Note

Set the type of connected safety edge using the menu:
System Config- ▸Safety Edges

Refer to the Safety Edge menu description for additional information.

CONDUCTIVE WITH RESISTOR

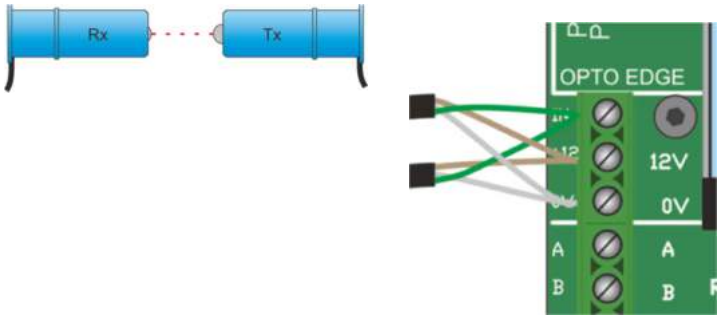
Connect the safety edge to terminals 1 and 2. The Safety Edge can be either a normally-open or normally-closed contact with termination resistor. The value of the required termination resistor and contact type must match the setting in the DG-Mini. If no safety edge is connected, the door will only operate in jog mode.



Note: Normally-Open type safety edge shown

O.S.E./ OPTO TYPE 3 WIRE SYSTEM

Connect the receiver and transmitter wires with the same color into the same terminal (Parallel).



Type:	Terminal No.:		
	X29 (0V)	X27 (Signal)	X28 (+12V)
Fraba System	**White**	**Green**	**Brown**
Telco SG15-OSE	**Blue**	**Black**	**Brown**

PHOTOEYE

The controller is able to interface with different types of photoeyes. Terminals 19 thru 22 are used for connecting NPN, N/C switch, D.O.T. or Telco LS100 series photoeyes.

WARNING

To avoid damage to the system, set up the correct photocell type to avoid damage to transmitter use the menu:
System Config ▸ Photoeye ▸ Type

NOTE

The dedicated photoeye feature is not currently supported

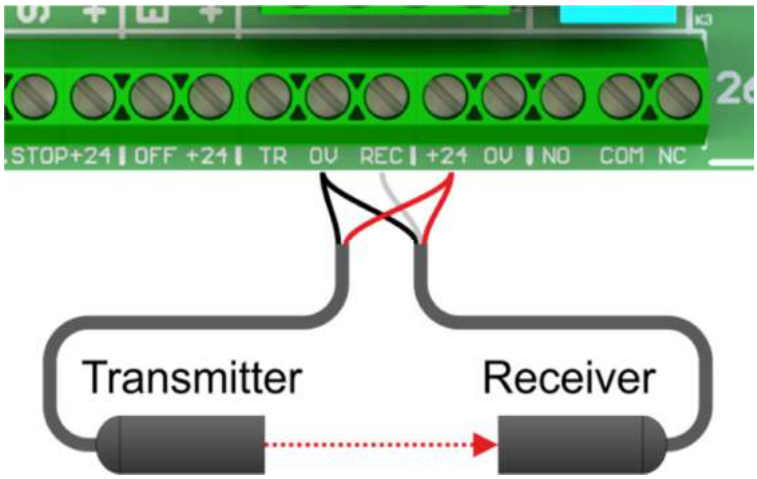
Note

When using a PNP type photoeye, connections are made to the programmable inputs. See the Programmable Input section of this manual for details.

NPN OR NC SWITCH TYPE

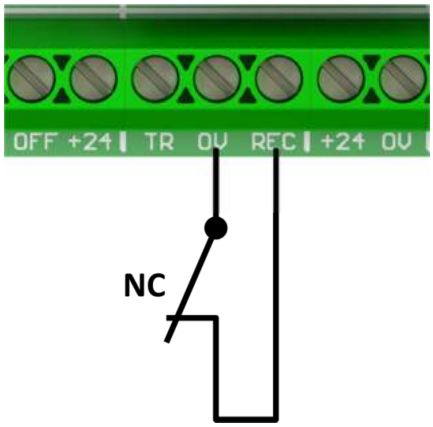
NPN NC type:
The photoeye input is compatible with a standard NPN N/C type photoeye output. This must be connected as illustrated below to 0V, REC (input) and +24V.

Refer to the photoeye manufacturor's datasheet for specific wiring and mounting information. Wire colors shown on right are for example only.



NC Switch type:

The photoeye input is compatible with a standard N/C switch type output, such as a relay contact. This must be connected between 0V and the REC input as illustrated below.

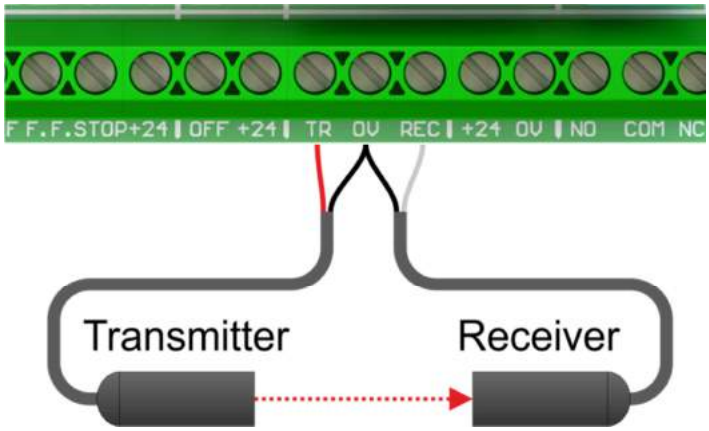


D.O.T. SYSTEM

D.O.T System Wiring:

Installation

Switch off the supply to the control panel and connect as shown above.



Always install the receiver (with white cable) closest to the door controller:

This provides the best noise immunity. Mount the transmitter at approximately the same height on the opposite side of the door. The exact position can be adjusted for the best alignment using the control panel as described below.

Alignment

When the D.O.T system is the selected photoeye type, an additional menu is available in the System Status menu.

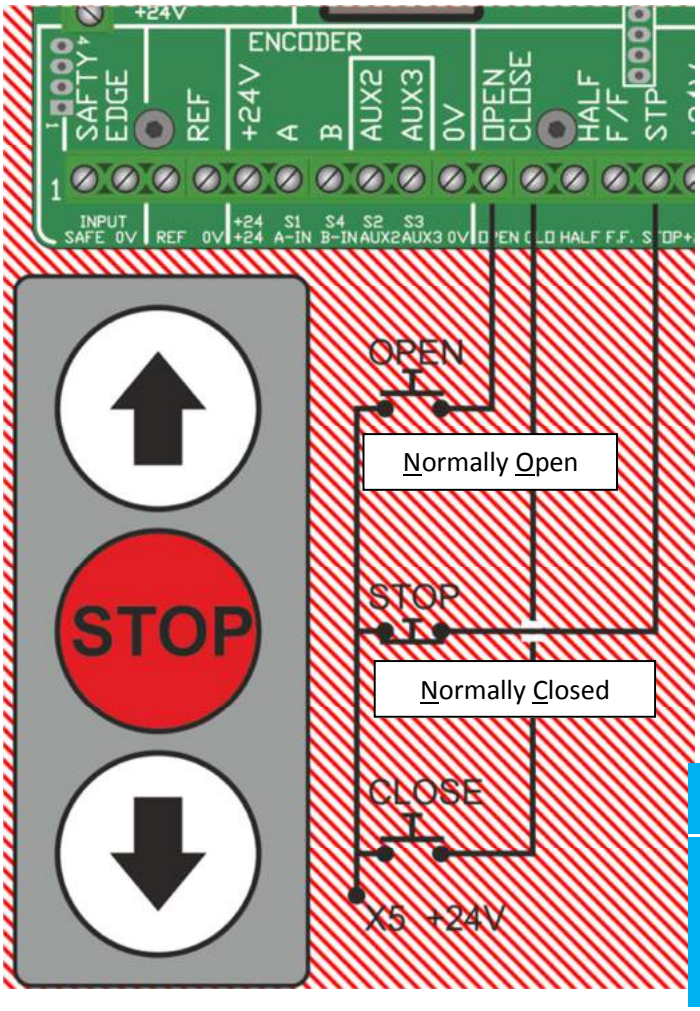
Test the photoeyes while the door is closing to ensure correct operation of the system.

NOTE

To aid in alignment use the menu:
System Status ▸ Photocells

This menu is used to see the signal strength. The received signal strength is displayed as a number. Move the transmitter until the highest possible value can be achieved. The minimum value is 3.

Programmable Inputs



The **function** and logic of each input can be individually configured.

All inputs are 12-24V DC compatible.
***Function** and **logic** (NO / NC) are programmable.*

Programmable input default assignments.

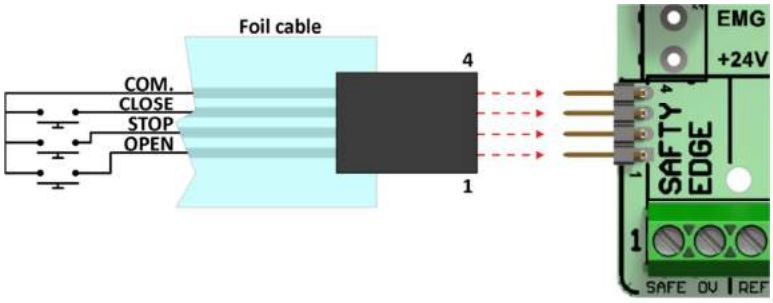
Terminal #:	Default function:
8	Photoeye 1
9	Photoeye 2
11	Open
12	Close
13	Partial
14	Auto
15	Stop
17	Hand Crank

Note

To program control signals parameters please use the menu:
System Config ▸ Inputs
See Input configuration section for details

Front Panel Button Connections

The front panel buttons can be programmed to function as Open-Close-Stop, Open with Auto close, or Jog mode.



POWER UP SEQUENCE

When power is switched on, the display will show the model information i.e. power, voltage rating, serial number, software version and active profile.

Screen Shots

Product Serial Number

Firmware Version

Wireless Status

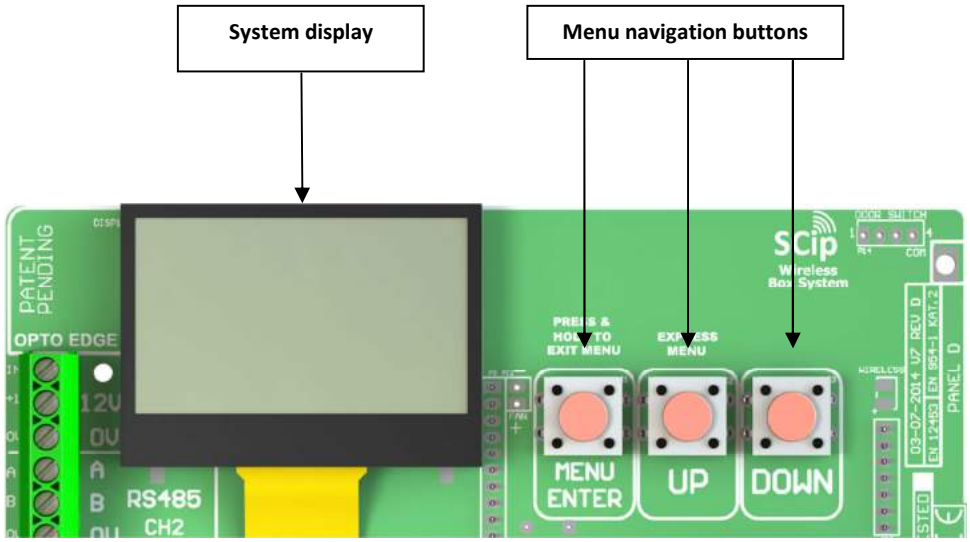
Active Door Profile

Final Splash Screen

MENU NAVIGATION

LAYOUT

The door controller has a graphic display and 3 buttons for configuring the controller.



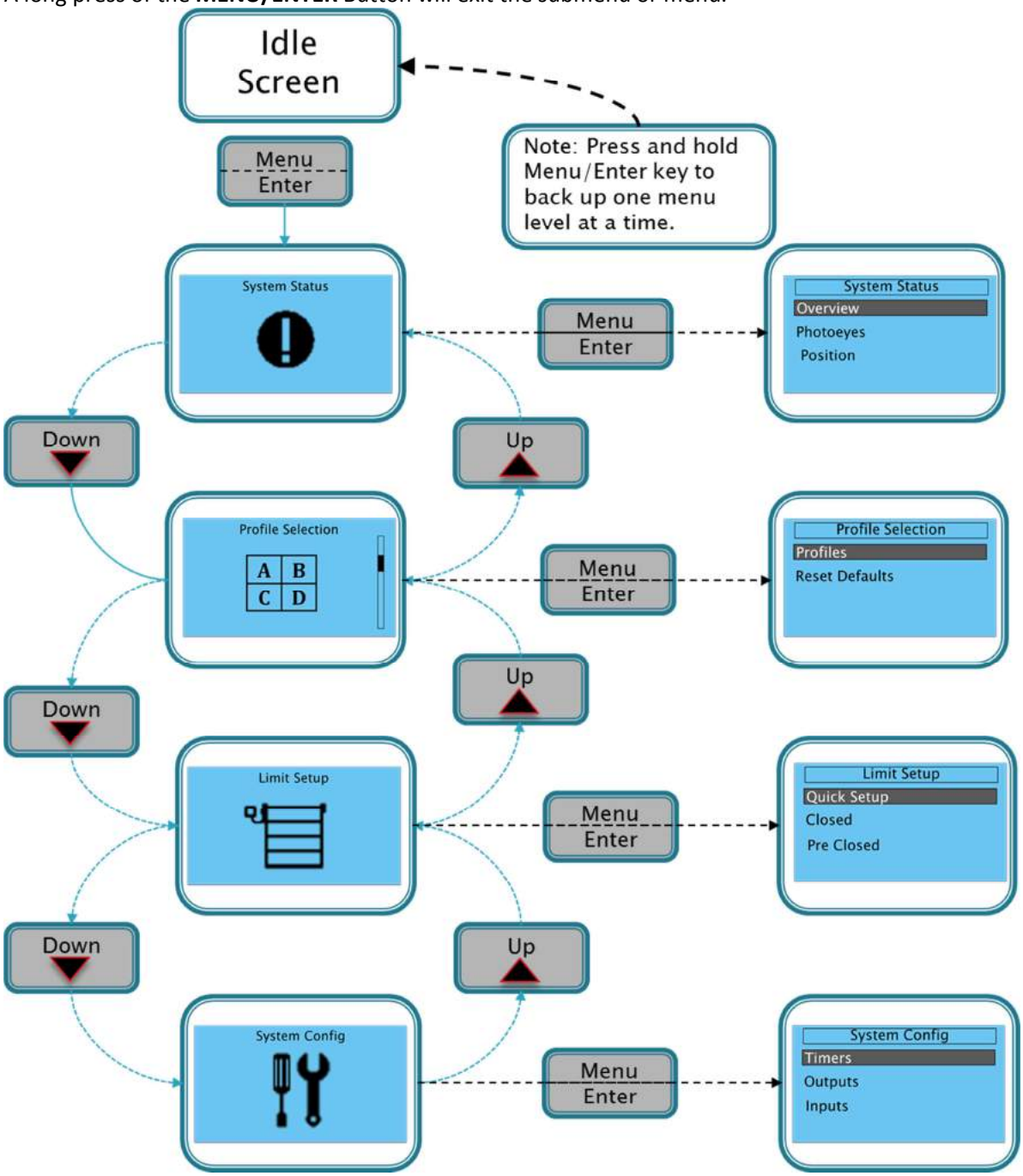
BUTTON FUNCTIONALITY

Button:	Short press Function	Long Press Function (> 2 seconds)
MENU / ENTER	Enter selected menu	Exit menu
UP	Navigate one step UP	Scroll UP
DOWN	Navigate one step DOWN	Scroll DOWN

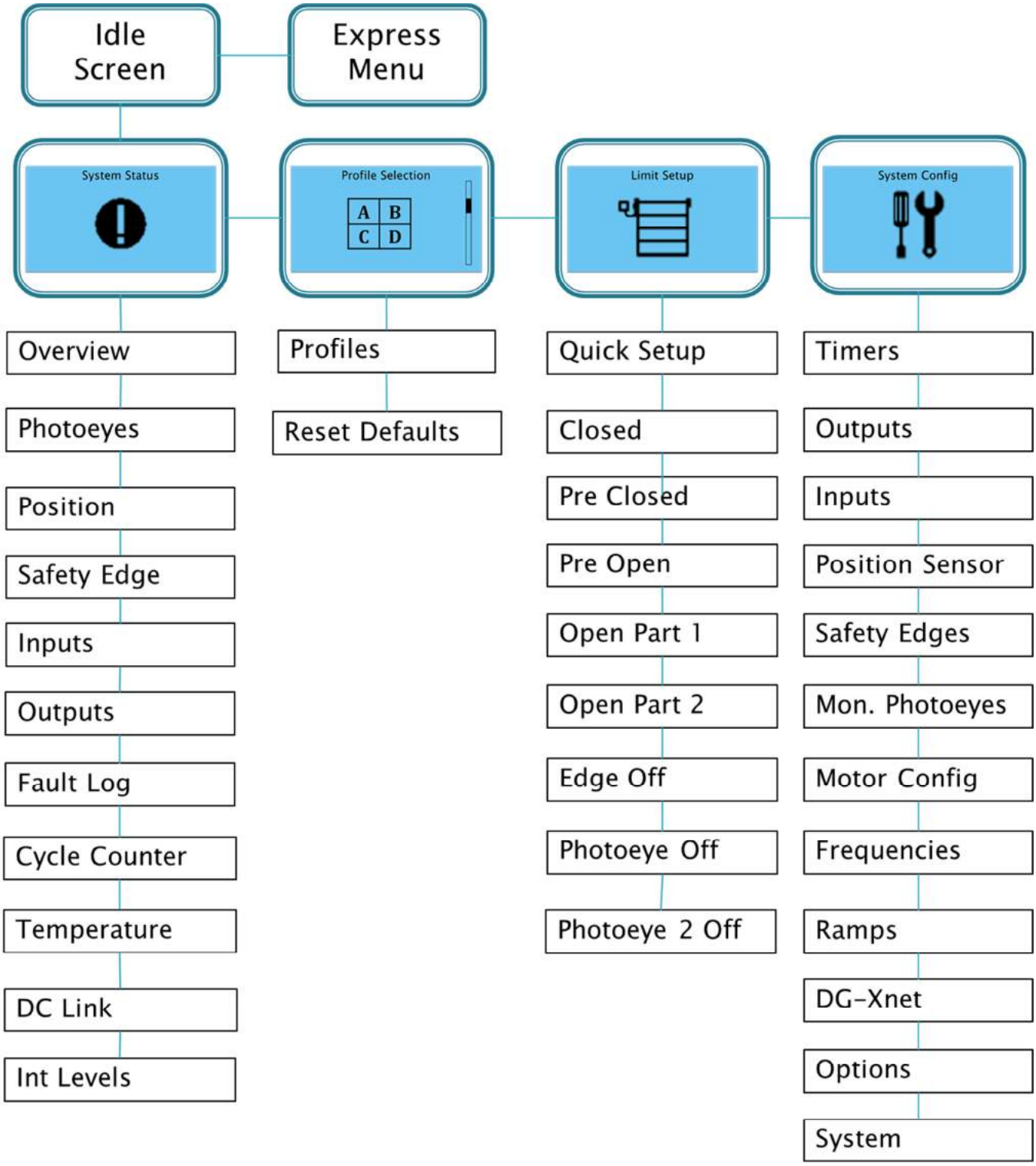
MENUS

The main menu is displayed as graphic icons on the display.
The sub menus below the main menu are “text listed” menus.

- Menus are navigated using the **UP**, DOWN and **MENU/ENTER** buttons.
- A menu or submenu is entered by a short press of the **MENU/ENTER** button.
- A short press of the **MENU/ENTER** Button while inside of a submenu will confirm a selection.
- A long press of the **MENU/ENTER** Button will exit the submenu or menu.



MENU TREE


Idle Screen
Express Menu
System Status
Profile Selection
A B C D
Limit Setup
System Config
Overview
Photoeyes
Position
Safety Edge
Inputs
Outputs
Fault Log
Cycle Counter
Temperature
DC Link
Int Levels
Profiles
Reset Defaults
Quick Setup
Closed
Pre Closed
Pre Open
Open Part 1
Open Part 2
Edge Off
Photoeye Off
Photoeye 2 Off
Timers
Outputs
Inputs
Position Sensor
Safety Edges
Mon. Photoeyes
Motor Config
Frequencies
Ramps
DG-Xnet
Options
System

ACCESS LEVEL

To prevent unauthorized changes to the controller some menus are Access Level protected and require a code to gain access.
Use the **UP** and **DOWN** Buttons to enter the access code and then press the **ENTER** button. Holding either the **UP** or **DOWN** button will increase the rate at which the value changes.

Code:	Description:
104	Installer
123	Tech Support
236	OEM

NOTE

The DG-Mini will automatically exit the menu after a short-period of inactivity. The Access Level code will need to be entered again to gain access to the menu.

VALUES AND FUNCTIONS

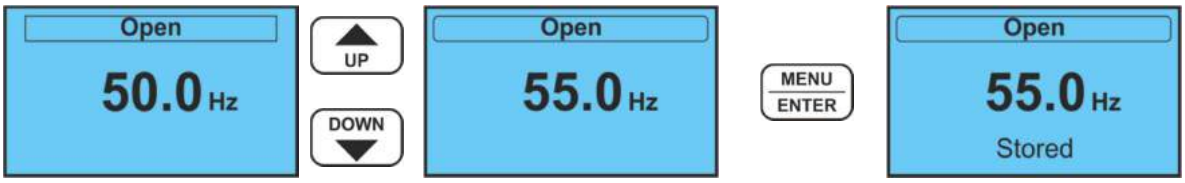
Changing values:

When configuring the controller's numeric parameters use the **UP** or **DOWN** buttons to adjust the value.

Storing values:

Store the value by a short press of the **MENU/ENTER** button.
The display will show "Stored"
To exit without storing the value press and hold **MENU/ENTER** button.

An example for setting the open frequency is shown below.



Selecting an item:

When selecting an item from a list based menu the currently enabled item is indicated by a filled box.

The **UP** or **DOWN** buttons are used to navigate the list. The current position is highlighted.

A short press of the **MENU/ENTER** button will enable the highlighted item and is indicated by the box being filled.

A Long press of the **MENU/ENTER** button will exit the menu without making any changes.

An example of selecting the function for Relay 1 is shown below.

PROGRAMMING

IDLE SCREEN

The Idle (or home) screen is displayed during normal operation when no errors are present and when not in a menu.

Example 1

Example 2

The display is divided into the following three sections:

Top	**Notifications:** Displays non-critical information such as the cycle count and provides a quick overview of the system using icons.
Middle	**State:** Displays the current state of the controller or an active event timer. See the table below.
Bottom	**Event:** Displays a message corresponding to an event such as an input activation. The message is displayed briefly for a momentary event or for the duration of a maintained event.

Controller States	
Display:	**Description**
OFF	Door controller is disabled.
IDLE	Door is stopped but not at a defined position. (Such as Partial 1, Partial 2 or Fully Open)
FIND REF	Door must perform a reference run.
LOCKED	Door is locked and cannot operate until the lock signal removed.
JOG	Door is in operating in Jog mode.
CLOSED	Door is at the Fully Closed position.
CLOSING	Door is closing.
OPEN	Door is at the Fully Open position.
OPENING	Door is opening.
PART 1	Door is at the Partial 1 position.
PART 2	Door is at the Partial 2 position.

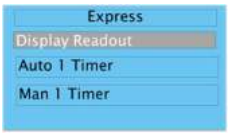
ERROR SCREEN

When an error is present the idle screen is replaced by a screen showing the error code and a description of the error. See the section on troubleshooting for further details.

Express Menu

The Express menu provides a quick method to edit commonly used parameters.
It is entered by pressing **UP** button while the controller is in the IDLE screen. It navigated using the standard **UP**, **DOWN** and **MENU/ENTER** buttons described earlier.

EXPRESS MENU

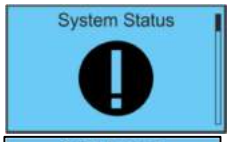
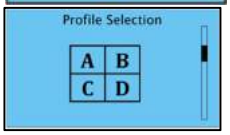
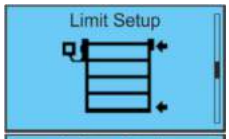
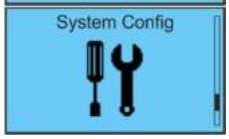


Menu and Submenu		Description:
Display Readout	**Normal**	Displays the standard Idle screen.
	Motor Current	Displays actual motor current measured by the controller.
	DC Link	Displays the internal DC Link voltage.
	Position	Displays the current position in Encoder Counts.
	Measured Frequency	Displays the measured frequency calculated from a compatible encoder.
	Output Frequency	Displays the frequency output to the motor.
Auto 1 Timer		Shortcut to adjust the Auto 1 Timer.
Man 1 Timer		Shortcut to adjust the Manual 1 Timer.
DTO Timer		Shortcut to adjust the Delay To Open Timer.
DTC Timer		Shortcut to adjust the Delay To Close Timer.
Open Alarm		Shortcut to adjust the Open Alarm Timer.
Run Timer		Shortcut to adjust the Run Timer.
Emergency Jog		While in this menu the controller will operate jog mode. **WARNING** **ANY CONNECTED SAFETY INPUTS WILL BE IGNORED TO ALLOW UNRESTRICTED MOVEMENT OF THE DOOR.**
Reset		Shortcut to reset the controller.

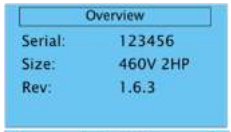
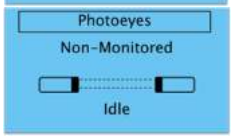
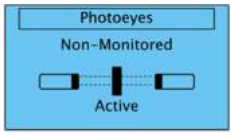
Main Menu

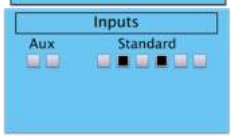
The main menu is entered by pressing the MENU/ENTER button from the *Idle* menu

MAIN MENU

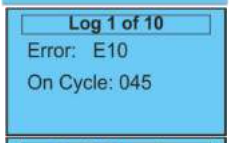
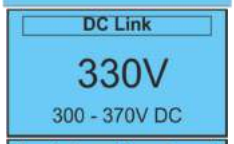
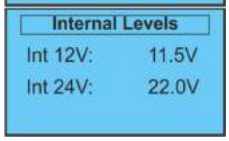
	Menu Name	Description:
	**System Status**	A read-only menu that provides status displays for use in setup and troubleshooting.
	**Profile Selection**	A menu used during installation to load the default settings for a specific door type. **CAUTION** ***Loading a profile will cause all related parameters to be overwritten with the defaults of the loaded profile!***
	**Limit Setup**	A menu to setup or adjust the door positions.
	**System Config**	A menu to configure the controller's settings.

SYSTEM STATUS

		Description:
	**Overview**	Displays the controller's serial number, ratings and software revision.
 	**Photoeyes**	Displays the status of the photoeyes. Change between photoeye 2 by pressing the **UP** button
	**Position**	Displays the current encoder count. If an incremental encoder is used information about the reference status is also shown here. This screen may also display the status of the encoder's internal battery when supported.

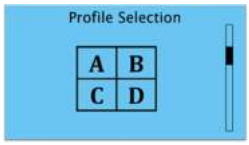
	**Safety Edge**	Displays the current status of the wired safety edge.
	**Inputs**	Displays the state of the controller's digital inputs. Active inputs are indicated by a filled box.

SYSTEM STATUS (CONTINUED)

	Description:	
	**Outputs**	Displays the current state of the controller's outputs. Active inputs are indicated by a filled box.
	**Fault Log**	A Log of the last 10 errors. Displays the Error code and the door operation cycle it occurred on. Use the **UP** or **DOWN** buttons to navigate through the log.
	**Cycle Counter**	Displays the total number of door cycles. Open / Close = 1 Cycle.
	**Temperature**	Displays the internal temperature of the controller. Note this is a raw analog value from inside of the controller and is **not shown as °C / °F.**
	**DC Link**	Displays the current internal DC Link voltage and the range it should be within.
	**Internal Levels**	Displays the controller's internal supply voltages. The Internal 12V supply should be within +/- 1V and the internal 24V supply should be in the rage of 20-24V.

PROFILE SELECTION

Description:



To simplify installation the DG-Mini contains preset defaults called profiles. Each profile contains the manufacturer's recommended initial settings for a particular door model. The profiles allow an installer to quickly set up a door.

After a profile has been loaded the controller can be further adjusted to meet a specific customer's requirements as needed. (Such as timer settings, input configurations and other options)

CAUTION

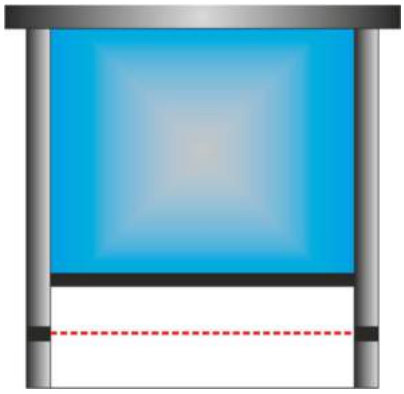
Loading a profile will cause all related parameters to be overwritten with the defaults of the loaded profile!

LIMIT SETUP

The DG-Mini allows for several programmable door positions. The connected encoder is used to determine the door position.

Common door positions are shown in the example to the right. Additionally, depending on the encoder type it may be necessary to have a reference switch input so that the controller can determine a door's position after power up.

Rolling door positions example:

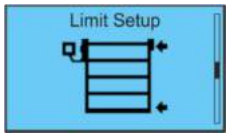


- **Breakaway**
- **Fully Open**
- **Pre open**
- **Part open 1**
- **Part open 2**

- **Photoeye OFF**
- **Safety edge OFF**
- **Pre closed**
- **Fully closed**

Position	Description
Breakaway	This is a position used on some door types to reset a breakaway condition.
Fully Open	Highest position the door will travel to under normal operation
Pre Open	The position at which the controller starts to slow down an opening door
Part 1	A position below Fully Open, usually used for man or low height vehicle traffic.
Part 2	A position lower than Part 1, also usually used for man or low height vehicle traffic.
Photoeye OFF	The position below which the controller ignores activation of the photoeye input
Safety edge Off	The position below which the controller ignores activation of the safety edge
Pre Closed	The position at which the controller starts to slow down a closing door
Closed	Lowest position the door will travel to under normal operation

LIMIT SETUP



Submenu	Description:
Quick Setup	Initiates the "Quick Setup" which is required to initially set up the controller. (Door positions, travel direction etc.) A Quick Setup must be performed before manual adjustment using the menus below Please see the section Quick Setup for further details.
Closed	Each submenu allows the manual adjustment of a specific door position if required. The door can be jogged by using the **UP**/**DOWN** buttons on the controller or front panel buttons. The **MENU/ENTER** key is used to save the position and to exit the submenu.
Pre Closed	
Pre Open	
Open	
Open Part 1	
Open Part 2	
Edge OFF	
Photoeye OFF	
Photoeye 2 OFF	

SYSTEM CONFIG

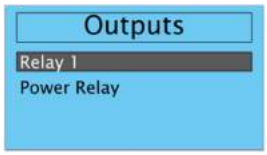
Fix picture

	Description:
Timers	A submenu for configuring timers.
Outputs	A submenu for configuring outputs
Inputs	A submenu for configuring inputs
Position Sensor	A submenu for configuring the position sensor
Safety Edges	A submenu for configuring the wired safety edge
Mon Photo Eyes	A submenu for configuring monitored photoeyes
Motor Config	A submenu for configuring motor related settings
Frequencies	A submenu for configuring motor frequencies
Ramps	A submenu for configuring motor frequency ramps.
DG-Xnet	A submenu for configuring the DG-Xnet wireless options
Options	A submenu for configuring optional devices.
System	A submenu for configuring system level items.

TIMERS

	Description:
Auto 1	The time period after which the door will close automatically after an Auto input has been activated and released, in seconds and tenths of seconds. Set to zero to disable.
Manual 1	The time period after which the door will close automatically after an Manual input has been activated and released, in seconds and tenths of seconds. Set to zero to disable.
Delay to Open	The time period for which an input must be maintained before the door initiates an opening cycle. Set to zero to disable.
Delay to Close	A time period imposed prior to any door closing event. Set to zero to disable.
Open Alarm	The maximum time period the door can remain in the Open position before an Open Alarm error occurs. Set to zero to disable.
Run Timer	A safety feature that stops door movement if the DG-Mini detects that the door is still in motion after the Run Timer period elapses. The Run Timer is automatically set after a Quick Setup has been performed. The Run Timer can be manually adjusted if necessary. The Run Timer cannot be disabled.
Input Stuck	The maximum time period that an input can be held in the “active” state before generating an Input Stuck error. Set to zero to disable.

OUTPUTS



	Description:
Relay 1	Configuration of Relay 1. (See Relay Output Function table below) **CAUTION** **Do not exceed the relay's maximum electrical ratings of 1A @ 24V DC, 0.5A @ 120V AC.** **Resistive loads only.**
Power Relay	Configuration of the Power Relay. (See Relay Output Function table below) **CAUTION** **Do not exceed the relay's maximum electrical ratings 5A @ 240V AC.** **Resistive loads only**

RELAY OUTPUT FUNCTIONS	Description:
☐ No Function	Output is disabled.
☐ Door Moving	Output is active anytime the door is in motion.
☐ Door idle	Output is active anytime the door is not in motion
☐ Door Open	Output is active whenever the door is at the Fully Open.
☐ Door Closed	Output is active whenever the door is at the Fully Closed.
☐ Door Not Closed	Output is active whenever the door is above the Fully Closed position.
☐ Open Partial	Output is active whenever the door is at either the Open Part 1 or Open Part 2 position.
☐ Door Opening	Output is active whenever the door is moving in the open direction.
☐ Door Closing	Output is active whenever the door is moving in the closed direction.
☐ Delay To Close	Output is active whenever the Delay to Close Timer is greater than zero and the door is commanded to close.
☐ Delay to Open	Output is active when the Delay To Open Timer is greater than zero and the door is commanded to open. The input must remain activated until the Delay To Open Timer has expired, the output will be active during this time. Upon expiration of the timer the door opens and the output is deactivated.
☐ Auto 1 Active	Output is active whenever the Auto Close Timer is greater than zero.
☐ System Error	Output is active whenever an error is present.
☐ Pre-Warn	Output is active whenever the Auto Close or Manual 1 timers are active. The output remains active through the closing cycle until the door is Fully Closed.
☐ Open Alarm	Output is active if the Open Alarm Timer has expired.
☐ Open Light	Output is active whenever the door is in the Open State. This function should be used whenever door state signaling is required.
☐ Closed Light	Output is active whenever the door is in the Closed State. This function should be used whenever door state signaling is required.
☐ Part open Light	Output is active whenever the door is in the Open Part 1 or Open Part 2 State. This function should be used whenever door state signaling is required.

Note: The Power Relay's function is normally set to Door Moving and is used to control the parking brake.

INPUTS

The DG-Mini includes 8 user-programmable inputs. Each Input can be individually configured through a multilevel menu.
Start by selecting the desired physical input using the Input Menu.
Then select the desired configuration submenu as described below.

CAUTION

Loading a profile will replace the input configuration with the profile's default settings. <u>This will cause any manual changes to the Input configuration to be lost.</u>

INPUT MENU	CONFIGURATION SUBMENU	Sub menus:	Description:
		**Function**	Submenu to select the function for the input. See the table below for descriptions of input functions.
		Name	Submenu to select the name to be associated with the input. The menu contains a list of commonly used names. ***Note:*** *this name is only used in the Idle screen. It does not change the name used in the configuration menu.*
		Logic	Submenu to select the logic for the input, either NO / NC.

INPUT FUNCTIONS

MENU ITEM	Description: (when the input is active)
☐ **No Function**	Input is disabled.
☐ **Manual 1**	An activation of this input will open the door unless the door is already at an open position. In this case the door will close. If the Man 1 Timer is set greater than zero the controller will delay closing of the door until the timer has expired.
☐ **Open**	An activation of this input will open the door to the Fully Open position.
☐ **Auto 1**	An activation of this input will open the door to the Fully Open position. The controller will then delay the door for the duration of the Auto 1 Timer. Upon expiration of the timer the controller will then close the door to the Closed Position.
☐ **Stop**	Activation of this input will stop motion of the door. This input is also used to clear certain error conditions.
☐ **Close**	An activation of this input will close the door to the fully close position.
☐ **Emergency Stop**	An activation of this input will cause the door to immediately stop motion.

☐ **Safety Edge**	An activation of this input during a closing cycle will cause the door to stop motion and then reverse to the Fully Open position. This will also cause an E10 error “Safety Edge Activated”.
☐ **Photoeye 1**	An activation of this input during a closing cycle will cause the door to stop motion and then reverse to the Fully Open position. This will also cause an E28 error “Photoeye 1 Activated”.
☐ **Lock Open**	Activation of this input will cause the controller to hold the door at the Fully Open position. The input must be continually activated to hold the controller in the Locked state. A deactivation of this input will unlock the door and allow normal operation.
☐ **Lock Close**	Activation of this input will cause the controller to hold the door at the closed position. The input must be continually activated to hold the controller in the Locked state. A deactivation of this input will unlock the door and allow normal operation.
☐ **Open Jog**	Continuous activation of this input will move the door in the open direction at Jog Speed. A deactivation of the input will stop motion of the door.
☐ **Close Jog**	Continuous activation of this input will move the door in the Closed direction at Jog Speed. A deactivation of the input will stop motion of the door.
☐ **Breakaway**	Activation of this input will stop motion of the door. This will also cause an E31 error “Breakaway Active”. A Breakaway reset procedure will be required. See the Trouble Shooting section for details.
☐ **Open Part 1**	Activation of this input will open the door to the Open Part 1 position.
☐ **Open part 2**	Activation of this input will open the door to the Open Part 2 position.
☐ **Auto 1 Part 1**	Activation of this input will open the door to the Open Part 1 position. The controller will then delay the door for the duration of the Auto 1 Timer. Upon expiration of the timer the door will close to the Fully Closed position.
☐ **Auto 1 Part 2**	Opens the door to the Partial 2 position and starts the Auto Close Timer. Activation of this input will open the door to the Open Part 2 position. The controller will then delay the door for the duration of the Auto 1 Timer. Upon expiration of the timer the door will close to the Fully Closed position.
☐ **Photoeye 2**	An activation of this input during a closing cycle will cause the door to stop motion and then reverse to the Fully Open position. This will also cause an E29 error “Photoeye 2 Activated”.
☐ **Man 1 Part 1**	Activation of this input will open the door to the Open Part 1 position if the door is not at this position. If the door is already at or above this position the door will close. If the Man 1 Timer is greater than zero, the controller will delay the door for the duration of the timer. Upon expiration of the timer, the door will close to the Fully Closed position.
☐ **Man 1 Part 2**	Activation of this input will open the door to the Open Part 2 position if the door is not at this position. If the door is already at or above this position the door will close. If the Man 1 Timer is greater than zero, the controller will delay the door for the duration of the timer. Upon expiration of the timer, the door will close to the Fully Closed position.

☐ **Hand Crank**	Continuous activation of this input will disable the controller from moving the door. This will also cause an E31 error "Hand Crank active". Deactivation of this input will return the controller to normal operation and clear the corresponding error.

Standard Input Configuration*				
Input Terminal #	**Input Label**	**Default function**	**Default Name**	**Default Logic**
8	Aux 2	Photoeye1	Photoeye1	Normally Closed
9	Aux 3	Photoeye2	Photoeye2	Normally Closed
11	Open	Open	Open	Normally Open
12	Close	Close	Close	Normally Open
13	Partial	Open Part 1	Open Part 1	Normally Open
14	Auto	Auto 1	Auto 1	Normally Open
15	Stop	Stop	Stop	Normally Closed
17	Off	Hand Crank	Hand Crank	Normally Closed

**For reference only, may change based on profile*

Front Panel Input Configuration

Option	**Description**
Normal	Open and close buttons function normally
Auto Close	The Open button is treated like an Auto 1 input and the Auto 1 Timer is used
Jog Only	The Open and Close buttons function strictly as constant pressure (Jog) mode and the door will move only as long as a button is held.

Position sensor

The DG-Mini controller requires a position sensor to operate a door. The controller must know the resolution of the connected position sensor. The resolution of the position sensor is the amount of movement/displacement the sensor is able to measure. Typically a rotary encoder, a type of position sensor, is used with the controller. The resolution of a rotary encoder is usually given as a ratio over one full revolution of the sensor such as 1.4°, 8-bit or 256 counts per revolution (all the same resolution). The resolution and maximum number of revolutions for a selected rotary sensor are supplied by the manufacturer.

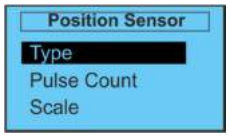
A rotary encoder can be mounted in different locations on a door. The two most common locations are directly to the motor shaft or on the drum shaft. This is important to note as the controller must be programmed to match the expected rotary encoder's resolution ***in relation to the motor*** including any reductions in resolution due to the mounting location.

For example, if a rotary encoder with a resolution of 256 counts per revolution is mounted directly to a motor shaft, the final resolution would be 256 counts per revolution as there are no resolution reductions. Conversely, if a rotary encoder is mounted to a drum shaft driven by a gear motor with a ratio of 10:1, the final resolution would be (256 / 10 = 27) 27. This equates to the rotary encoder reporting 27 counts (1/10 of a rotation) for every full revolution of the motor. This final resolution number is programmed into the controller during installation. This value is critical. The position sensor measures the door position and reports it to the controller. The controller then uses this value to operate the motor and to determine door position. The controller is optimized when full door travel (open position - closed position) is greater than 1000 counts but less than 10000 counts. The number of counts for full door travel, as described above, is dependent on the resolution of the position sensor used and its mounting location. The controller uses an internal position variable that has a maximum range of -32767 to +32767 counts. Therefore it may be necessary to scale the position sensor reported position to satisfy the optimum travel and maximum count restrictions. Please seek assistance from BTR Controls, Inc when determining an appropriate position sensor and its corresponding programming requirements.

When using a BTR Absolute Encoder it is not necessary to manually program the individual position sensor parameters. Using the Gear Ratio parameter, located in the System Config->Motor Config menu, the DG-Mini can automatically configure itself. The Gear Ratio parameter is the number of motor revolutions needed for the BTR Absolute Encoder to make one full revolution. This depends only on the mounting of the BTR Absolute Encoder ***in relation to the motor***. For example, if the BTR Absolute Encoder is mounted directly to the motor shaft the Gear Ratio parameter would be set to 1. Conversely, if the BTR Absolute Encoder is mounted to a drum shaft driven by gear motor with a ratio of 10:1, the gear ratio would be set to 10. No further program is required.

Position sensor

POSITION SENSOR MENU



ENCODER TYPE

		Description:
Type	**2Ph Encoder**	Quadrature incremental encoder (reference switch required)
	Limit Switch	Not supported in standard software.
	BTR Encoder	BTR absolute encoder.
	AWG Encoder	Not supported in standard software.
	Dynaco Encoder	Dynaco absolute encoder
	GFA Encoder	GFA absolute encoder
	Feig TST-PD	Feig absolute encoder
	Dall MAE	Dall MAE absolute encoder
	B102	B102 Albany absolute encoder

Pulse Count	**Pulses:** The pulse count is the number of pulses per motor revolution received from the encoder.
Scale	Depending on the encoder resolution and where it is mounted (either directly on the motor or after gear reduction) scaling of the position may be necessary. The scale factor is used to convert or scale the encoder's native resolution into the controller's internal door position value. Internally the controller represents the door's position as a number in the range of +/- 32767. An optimal Pulse Count setting of 32 is desired. Since the controller is optimized for a Pulse Count setting of 32. Divide the encoder's native resolution by
Pulse Output	A BTR encoder specific menu to set the number of pulses per revolution which is used in closed loop feedback. It is unlikely that a user will need to change this parameter as it is automatically computed when the **Gear Ratio Parameter** is set in the **Motor Configuration** submenu.

Pulse Sensor Types:

Type:	**Details:**
2Ph Encoder	Incremental Encoder. Requires a reference switch
Limit Switch	Limit switches are not supported in the current version of software
BTR Encoder	Absolute encoder – provides closed loop feedback.
GFA absolute encoder	Absolute encoder. No closed loop feedback.

SAFETY EDGES

The DG-Mini has a dedicated Safety Edge Input. The Safety Edge input can be configured through a multilevel menu to configure the type, number of retries and operating mode.

To configure the type of Safety Edge, select the Safety Edge 1 submenu and then select the type.
To set the number of automatic retries, select the Retry Count submenu and then select the desired number of retries. (Note: 3 retries is the recommended setting)

Select the desired Operational mode as described below.

CAUTION

Loading a profile will replace the input configuration with the profile's default settings. This will cause any manual changes to the Input configuration to be lost.

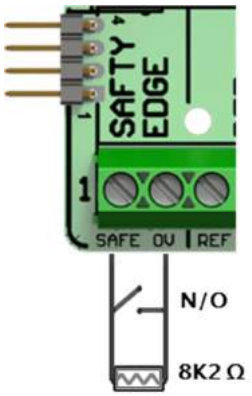
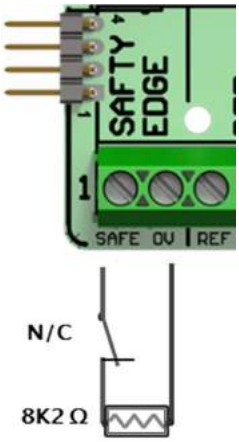
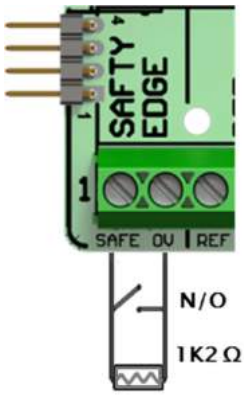
SAFETY EDGE MENU

Submenu		Description:
Safety Edge 1		Submenu to configure the type of safety edge. Refer to the table of compatible Safety Edges below.
Retry Count		Sets the number of consecutive retries attempts when the edge has been activated during a closing cycle. Choose between No Retries, 1 -5, or unlimited retries.
Operational Mode	☐ **Normal**	When Normal mode is selected the door will stop, reverse direction and open to the Fully Open position when the safety edge is activated. The DG-Mini will attempt to retry closing the door at normal closing speed.
	☐ **Slow Retry**	When Slow Retry mode is selected, the door will stop, reverse direction and open to the Fully Open position when the Safety Edge is activated. The DG-Mini will attempt to retry closing the door. The door will close at Jog speed until below the position at which the Safety Edge was activated; there the door will return to normal closing speed.

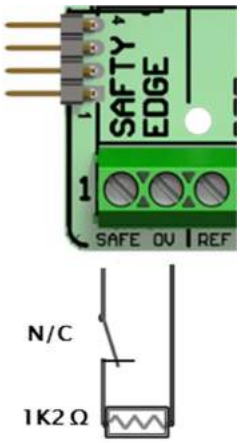
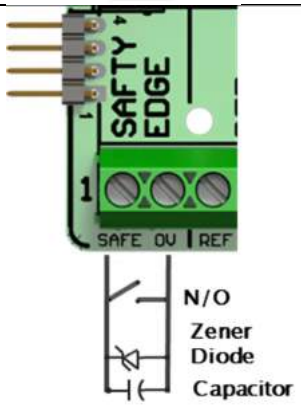
COMPATIBLE SAFETY EDGES

Type	Description:	
☐ **OFF**	Safety Edge is disabled	**WARNING** ***Operation without a safety edge is not recommended. Please note that the installer must make sure that the system complies with the safety related standards in the specific location of installation.***

COMPATIBLE SAFETY EDGES

Type	Description:	
☐ **NO with 8K2**	Safety Edge is a Normally Open contact in parallel with an 8.2k-ohm resistor.	
☐ **NC with 8K2**	Safety Edge is a Normally Closed contact in series with a 8.2k-ohm resistor.	
☐ **NO with 1K2**	Safety Edge is a Normally Open contact in parallel with a 1.2k-ohm resistor.	

COMPATIBLE SAFETY EDGES

Type	Description:	
☐ **NC with 1K2**	Safety Edge is a Normally Closed contact in series with a 1.2k-ohm resistor.	
☐ **Diode/Cap**	Safety Edge is a Normally Open contact in parallel with a 9.1V Zener diode and a capacitor.	
☐ **FRABA** ☐ **Radioband** ☐ **SeyWave Ext** ☐ **Lightcurtain** ☐ **Opto 1** ☐ **Opto 2**	Not supported in standard software, consult factory when using any of these safety edges.	

Monitored Photoeyes

Description:

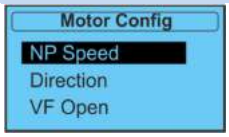
NOTE
The Monitored Photoeyes feature is not currently supported

OFF	Monitored Photoeyes are disabled.
ON	Monitored Photoeyes are enabled.

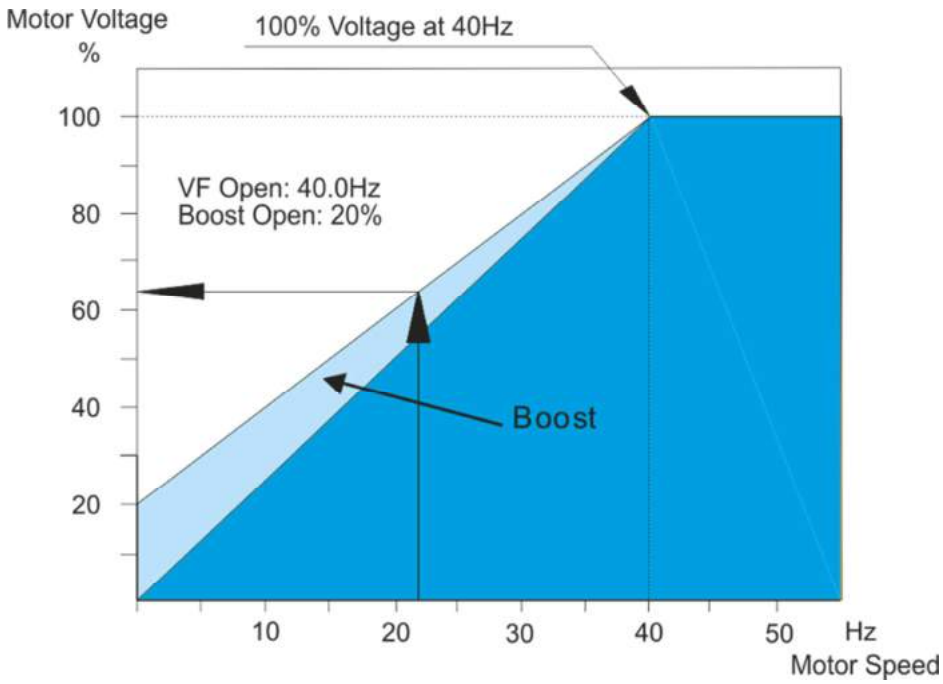
MOTOR CONFIG

The DG-Mini is compatible with a wide variety of AC induction motors. The motor must be a 3-phase asynchronous motor. The voltage rating on the nameplate of motor should match the model of the DG-Mini. The FLA rating of the motor should be less than the output current rating of the DG-Mini model.
Use the speed provided on the nameplate at 50Hz for the NP speed setting in the DG-Mini. See the NP Speed description below for details on how to convert a motor's nameplate speed to 50Hz if necessary.

These menus are used to configure the DG-Mini's settings to match the connected motor.

Motor Config menu	Submenu		Description:
	**NP Speed**		This is the normal motor Speed at 50 Hz. The value is obtained directly from the Motor's name plate speed i.e. 1350rpm at 50Hz. See the motor's label for speed rating. If the Motor's name plate speed is listed for 50Hz then enter that value, otherwise convert the nameplate speed to 50Hz based on the equation below. To convert a 60Hz speed rating to 50Hz divide by 1.2 Example: 1750 RPM at 60Hz/1.2 = 1458 RPM at 50Hz.
	Gear Ratio		This is the number of motor revolutions per one full revolution of the encoder. NOTE: ONLY USED WITH BTR ABSOLUTE ENCODER
	Direction		**Motor / Encoder direction:** **NOTE** *The controller will automatically set the direction during a Quick Setup.*
		☐ Normal	No change
		☐ Motor Rev	The motor's direction is reversed
		☐ Enc Rev.:	The Encoder's direction is reversed
		☐ Motor & Enc Rev.	Both the Motor and encoder are reversed
	V/F Open		This is the frequency at which maximum voltage is delivered to the motor while opening.
	V/F Close		This is the frequency at which maximum voltage is delivered to the motor while closing.
	Boost Open/ Boost Close		The Torque boost increases the voltage and thus the torque when the frequency is below the V/F frequency. If the boost is set too low the door may not move. If set too high excessive current draw may occur resulting in permanent damage to the controller or motor. Modify only if necessary.

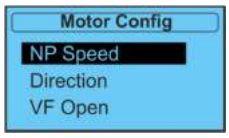
Example V/F Chart



Switch Freq.	This is the internal switching frequency used by the DG-Mini. Recommended value: 2.5 kHz. ***Note:*** *Increasing this setting will increase the power losses and raise the temperature of the motor and controller.*
Position Tol.	This sets the tolerance the controller uses when positioning the door. ***Example:*** *If the Fully Open position is set at 700 and Position tolerance is set to 5,the DG-Mini will stop driving the motor when the position reaches 695*

Continued on next page...

MOTOR CONFIG (CONTINUED)



	Description:
Relay Tol.	This sets the tolerance the controller uses for the signaling relays. Example: If the Fully Open position is set at 700 and Relay Tolerance is set to 30, the DG-Mini will activate an appropriately programmed relay when the position reaches 670.
DC Brake Cur.	DC braking is used to inject DC current into the motor windings which help stop the door within the position tolerance at the end of travel.
DC Brake Time	This is the duration of time DC current is injected into the motor after it has stopped.

Note

In applications where the ambient temperature is below 0°C / 32°F the controller can be configured to provide a constant DC current to the motor to prevent frost:

- *Set DC Brake Time to 100 for constant DC Brake.*
- *Set DC Brake Current according to the desired temperature rise.*

FREQUENCIES

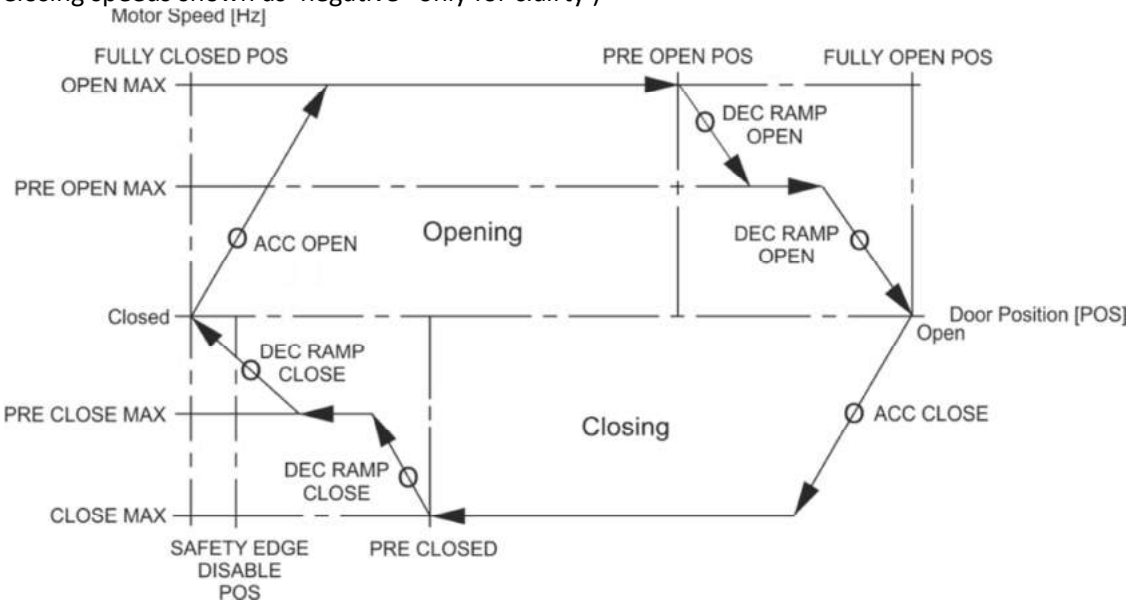
This menu is used to adjust the various speeds used by the DG-Mini during operation of the door.

Since the speed of the motor is directly proportional to the frequency of the voltage applied to it, the DG-Mini is able to control the door's speed by controlling both the voltage and frequency during door movement.

FREQUENCY MENU

Event:	Description:
Open	This frequency sets the maximum speed between the closed and pre-open positions.
Pre Open	This frequency sets the maximum speed between the pre-open and the Fully Open positions.
Close	This frequency sets the maximum speed between the open and pre-closed positions.
Pre Close	This frequency sets the maximum speed between the between the pre-closed and the Fully Closed positions.
Dead man	This frequency sets the maximum speed when operating under a constant-pressure mode or during a reference run.
Minimum	This frequency set the minimum speed of the motor. The DG-Mini will apply DC-Brake current when the motor's speed is less than this value.

Illistration of door speeds during a door opening and closing cycle.
Door position is on X-axis and door speed on is on Y-axis. (Note: Speeds are always positive; Closing speeds shown as 'negative" only for clairty)



Ramps

This menu is used to adjust the ramp rate for the various speed transitions during a door cycle.
Ramps are the rate at which the motor changes speeds. The larger the value the faster the motor (and hence the door) will accelerate.

For example, if the maximum opening speed is 75Hz and the ramp rate is 150Hz per second the door will reach its maximum speed in 0.5 seconds.

Ramps Menu

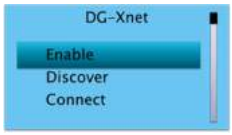
Ramp type:	Description:
Acc Open	This ramp is the rate at which the motor will accelerate while the door is opening.
Acc Close	This ramp is the rate at which the motor will accelerate while the door is closing
Dec Open	This ramp is the rate at which the motor deaccelerates to the Fully Open position.
Dec Close	This ramp is the rate at which the motor deaccelerates to the Fully Closed position.
Dec Stop Open	This ramp is the rate at which the motor will decelerate if the Stop Button is activated. This parameter should be set so that the door stops without excessive force.
Dec Stop Close	This ramp is the rate at which the motor will decelerate if the Stop Button is activated while the door is closing. This parameter should be set so the door stops without applying excessive force on the drive mechanism.
Dec Emergency	This ramp is the rate at which the motor will decelerate if a safety event occurs during any door movement.

DG-Xnet

This menu is used to configure the DG-Mini when the DG-Xnet is installed.

Note: The DG-Xnet is an optional feature requiring a special hardware module connected that is connected to the controller's RS485 port. The DG-Mini must detect this module during startup; therefore ensure required connections are made prior to startup. Refer to DG-Xnet documentation for further details.

DG-XNET MENU



Submenu		Description:	
Enable	☐ **Enable** / ☐ **Disable**	Submenu to enable or disable DG–Xnet operation	
Discover		Used to find other DG- Xnet devices in range.	
Connect		Submenu to enable communication between other DG-Xnet devices.	
X-Lock		Submenu to enable a wireless airlock between and up to five other DG-Xnet devices.	
Clear all		Used to disconnect all previously connected DG-Xnet devices from the DG-Mini. A reconfiguration of the DG-Xnet will be required.	
Settings	**Channel**	Used to set the communication channel for the DG-Xnet.	**NOTE**
	Network ID	Used to set the Network ID for the DG-Xnet.	*These settings must match all other DG-Xnet devices that are to be networked*

SEYWAVE

The DG-Mini has the ability to interface with optional BTR peripherals such as the Seywave® Wireless System and the wireless Illumadoor® LED Signaling System. This menu is used to configure any of these supported options.

The Seywave Wireless System allows for quick, reliable and cost-effective connection of peripherals such as pushbuttons, pull-cords, and palm operators for remote activation without the expense of running conduit. Additionally, the Seywave Wireless System supports a Sensor module that meets UL 325 Standards for Entrapment Protection.

The Illumadoor® is an LED strip light that can be used to provide visible indication of status for industrial doors . Each strip has 30 individual Red, Amber and Green LED's that can be wirelessly controlled from the DG-Mini when using the BTR Illumadoor® combination power supply and junction box. The DG-Mini controller has predefined and selectable logic covering a vast array of signaling applications from simple door position to air lock traffic control.

SEYWAVE

	Description:
Seywave Host	This submenu is used to configure the Internal SeyWave host.
Illumadoor	This submenu is used to configure the optional Illumadoor® peripheral.

SEYWAVE HOST

Description:

This submenu is used to enable the Internal Seywave system, pair remotes and sensors and to adjust operational settings.

It contains additional submenus for adjusting a sensor's impact level for breakaway detection and to expand the time window for which the sensor is looking for motion when a door starts to close.

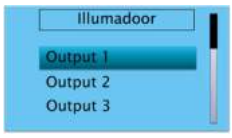
Refer to the documentation supplied with the SeyWave device for additional details.

Enable	Submenu to enable or disable the internal Seywave Host.
Pairing	Submenu to connect (pair) a SeyWave Wireless remote or sensor to the DG-Mini. Entering this menu will place the DG-Mini into pairing mode where it attempts to pair with a remote device. If successful, the paired device will be displayed on the screen. Otherwise "No Remotes Found" will be displayed. Once a device has been paired it will start functioning immediately without any further configuration.
Clear All	This submenu is used to disconnect all previously paired SeyWave devices from the DG-Mini. Performing this step will require all SeyWave devices to be Paired again. Performing this step will also cause the Internal SeyWave to automatically change the communication settings which include the channel and address used by the system. These settings are not user configurable. Perform a Clear All if performance issues are encountered.
Information	This submenu displays information about the software version.
Fast Sensor	This Submenu is used to enable or disable the Fast Sensor mode on a paired SeyWave Molded Door Sensor. Consult factory for usage details.
Impact Adjust	This submenu is used to adjust the Seywave Molded Sensor's breakaway impact detection level. The detection level can be set based on presets or manually adjusted. Note: The detection level value is a relative scale with zero being the most sensitive and a larger number represents a more severe impact before the breakaway fault is generated.
Motion Adjust	This submenu is used to adjust the maximum amount of time the DG-Mini will wait for a valid motion check message from a SeyWave Molded Sensor during a closing cycle. **WARNING!** Disabling this check is not recommended. Additional entrapment protection will be required if disabled.

ILLUMADOOR

NOTE

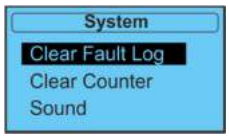
The Illumadoor feature is not supported in the standard firmware



	Description:
Output 1 **:** **Output 6**	This submenu is used to configure the individual outputs of a paired Illumadoor power supply. There are two submenus for each output: FUNCTION and FLASH. The FUNCTION submenu includes the same functions as described in the Relay Output function table. Refer to this table for descriptions. The FLASH submenu enables or disables flashing for that particular output when it is active.
Flash Rate	This menu sets the flash rate of the output, if the Flash setting is enabled.

SYSTEM

This menu is used for system-wide and factory configuration.



	Description:
Clear Fault Log	This submenu is used to clear the fault log. The **UP** button must be pressed to confirm the action.
Clear Service	This submenu is used to clear service messages. The **UP** button must be pressed to confirm the action.
Clear Cycle Cnt	Factory use only.
Sound	This submenu is used to enable or disable the internal sounder.
Backlight	This submenu is used to enable or disable the display's backlight.
Contrast	This submenu is used to set the display's contrast.
SW Update	This submenu is used for updating the DG-Mini firmware.
System Info	This submenu is used to identify the DG-Mini and includes Type, Power Size , and Voltage Rating.
SW Info	This submenu displays the DG-Mini's current software version.
Factory	Factory use only.
Language	This submenu is not supported at this time.
Diagnostics	Factory use only.

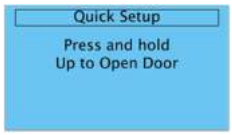
QUICK SETUP

The Quick Setup procedure is a required step during the installation of the DG-Mini. A Quick Setup must be performed after all connections and programming, including profile selection, have been completed.
The Quick Setup is used to set door positions and also validate the installation. If the Quick Setup encounters a problem it will abort and provide a corresponding error message. The error must be addressed before repeating a Quick Setup.

Performing a Quick Setup is the only way to clear an E17 "Reset Limits" error.

Follow the steps shown below and the on screen instructions to perform a Quick Setup.

Screen Shots

Step:	Display screens:			Action:
1				Use the **UP** and **DOWN** Buttons to move the door to near the center of travel. Note: The door may travel in the opposite direction of the button pressed. This is okay and is corrected in a later step. Press **ENTER** when finished.
2				Press and hold the **UP** Button until the door stops automatically.
3				When the door has stopped, follow the on screen prompts to confirm the door's travel direction. **Incremental encoder (Not shown):** If you are using an incremental encoder the controller will now perform a reference run to establish the reference location. Follow the on screen prompts.
4				Using the **UP** or Down Buttons move the door to the desired Fully Open position. Press Enter to store.
5				**Note:** ***This step may be skipped as not all profiles require a Breakaway position.*** Using the **UP** or **DOWN** Buttons move the door to the desired

				Breakaway position. Press **ENTER** to store.
6				Using the **UP** or Down Buttons move the door to the desired Fully Closed position. Press **ENTER** to store.
7				If everything was set correctly and no errors encountered “Quick Setup Done” will be displayed. The menu will automatically exit and return to the Idle screen. The DG-Mini is now ready for operation. If an issue was encountered “Quick Setup Aborted” will be displayed followed by a corresponding error message.

TROUBLESHOOTING

Overview

This chapter provides information on error codes that may occur on the DG-Mini along with troubleshooting information and corrective actions. High-priority codes preempt the display of lower-priority error codes.

Error Messages

If an error occurs, the idle screen is replaced by a screen showing the error code and a description of the error. An example error code display is shown below.

Error messages originate in one of three categories:

- Inverter (power faults)
- Door control codes related to the motor and encoder
- Option codes related to optional equipment used with the DGII

Consult the *Table of Error Codes* and *Error Code Priority Levels* tables below to determine the cause and corrective action. Depending on the type of error, user interaction may be required to clear the error. The error window closes when the error has been cleared/corrected.

For example, error E17 “Reset Limits” in the example above is because the door limits cannot be verified. In this case, the only corrective action is to perform a Quick Setup to re-establish the door’s positions.

Table of Error Codes

Error Code:	Description	Level	Cause:	Check:
UU	Low Mains Supply	Fault Specific	The mains voltage is too low	Check mains voltage and cabling
OU	High DC Link	Fault Specific	Over voltage. Either the mains voltage is too high or the deceleration is too fast	Check mains voltage. May also need to reduce the deceleration ramp using the menu **System Config ▸ Ramps Deceleration.** If deceleration is too fast the controller cannot dissipate the excess voltage quickly enough.
OC1	Overcurrent	Medium Priority	The drive is overloaded. The motor current exceeds the Inverter rating by 210%	Check motor connections and for mechanical obstructions.

Table of Error Codes

Error Code:	Description	Level	Cause:	Check:
OC2	Overcurrent	Medium Priority	The motor current has exceeded the inverter rating by 150% for more than 30 seconds.	Check for mechanical obstructions.
OC3	Overcurrent	Medium Priority	Over current while accelerating, the acceleration is too fast.	Check that the door is not binding, may need to reduce the acceleration level using the menu **System Config ▸ Ramps ▸ ACC OPEN**
OC4	Overcurrent	Medium Priority	Over current while dc braking operates.	The dc braking is too aggressive, adjust the DC Break level and duration using the menu **Sys Config ▸ Motor Config ▸ DC Brake**
OC5	Overcurrent Peak	High Priority	Severe overload, possibly permanent damage to the controller.	Check for a short. Check that the motor is not stalled. Check that the brake is releasing. May need to decrease the boost level using the menu **Sys Config ▸ Motor Config ▸ Boost**
OH	Controller Overheated	Fault Specific	Overheating inside the panel, the inverter is too hot.	Check ventilation. Check that current limits have not been exceeded.
HE	12V Supply Shorted	Fault Specific		
HE	24V Supply Shorted	Fault Specific	Low internal 12V or 24V supply.	Check I/O wiring for short or overload.
E01	Mechanical Overload	Low Priority	Mechanical overload (slip monitoring) or missing signal from the encoder.	Check the encoder wiring. Check that the motor is not stalled. Check for possible mechanical obstruction.
E02	Direction Error	Low Priority	Direction error.	Check encoder wiring. Rerun a Quick Setup. Confirm that the pulses count up while opening and down when closing the door.
E03	No Encoder Signal	Low Priority	No signal from the encoder - (only during installation).	Check the wiring related to the encoder, and any possible mechanical obstruction.
E04	Speed Error	Low Priority	Speed error	Check the wiring related to the encoder, check gear ratio.
E05	Ref. Connection Error	Medium Priority	The reference switch is shorted or broken.	Check the reference switch.
E06	Ref. Switch Position Error	Medium Priority	The reference switch operates in the wrong position.	If using an incremental encoder the reference switch has activated at the wrong position,

Table of Error Codes

Error Code:	Description	Level	Cause:	Check:
				or if using limit switches, the pre-close limit switch is open circuit.
E07	Run Timer Exceeded	Low Priority	Run time exceeded.	Verify that the door is running smoothly. May need to increase the RUN Timer setting. **System Config ▸ Timers ▸ Run Timer**
E08	Safety Edge Test Fault	Medium Priority	The safety edge test has failed.	Check the connections to the safety edge.
E09	Safety Edge Connection Fault	Medium Priority	Connection fault on safety edge 1	Check the connections to safety edge 1.
E10	Safety Edge Activated	Low Priority*	The safety edge 1 has operated.	Check if there is a mechanical obstruction.
E11	Rear Edge Activated	Low Priority	Connection fault on safety edge 2	Check the connections to safety edge 2.
E12		Low Priority	The safety edge 2 has operated.	Check if there is a mechanical obstruction in the door opening/closing.
E13	No Encoder Movement	Medium Priority	No Encoder Movement	
E14	Encoder Comm Loss	Fault Specific	Communication error with the absolute encoder	Check the wiring of the absolute encoder.
E15	Encoder Fault	Low Priority	Encoder Fault	Redo the quick setup
E16	Encoder Fault	High Priority		
E17	Reset Limits	Fault Specific	Reset Limits	Rerun the quick setup
E18	Airlock Failed To Confirm	Low Priority	X-net - Wireless airlock failed to authorize opening	
E19	No Response From DG-XNet	Low Priority	X-net - Wireless - No response	
E20	Backroll Error	High Priority	Backroll error. The door has moved when stopped.	Verify that the brake is properly engaging
E21	Seywave OCS Comm Loss	Fault Specific	Seywave Wireless OCS - Remote timeout	Verify that the remote is within range. Check batteries in remote.
E22	Seywave DS Remote Timeout	Fault Specific	Seywave Wireless door sensor timeout	Verify that the sensor is within range. Verify that the sensor's battery is ok.
E23	Seywave DS Connection Fault	Fault Specific	Seywave Door Sensor Connection Fault	Check wiring on the door sensor.

Table of Error Codes

Error Code:	Description	Level	Cause:	Check:
E24	SeyWave Internal Failure	Fault Specific	Seywave Wireless internal Fault	Contact factory, this is not a user-serviceable item.
E25	Hand Crank Active	Fault Specific	Hand Crank Active	This is a normal error when the Hand Crank input is active. If not cranking the door, verify that the crank is in position, verify that the switch is functional, check wiring connections.
E26	Door Overtravel	High Priority	Door Over Travel	
E27	Photoeye Test Fault	Medium Priority	Photoeye Test Fault	Check that test signals are connected correctly
E28	Photoeye 1 Activated	Low Priority	Photoeye 1 Activated	Normal message if the photoeye is active. Otherwise check alignment and wiring.
E29	Photoeye 2 Activated	Low Priority	Photoeye 2 Activated	Normal message if the photoeye is active. Otherwise check alignment and wiring.
E30	Input Timer Exceeded	Medium Priority	Input Timer Exceeded	Check for stuck input, such as a pushbutton, that has been activated for too long.
E31	Breakaway Active	Medium Priority	Breakaway Active	Jog the door to the breakaway position and then press the CLOSE button.

Error Code Priority Levels

Priority Level	Reset Condition	Comment
Low	**Activation Input**	Can also be reset by higher priority reset conditions.
Medium	**Stop, Monitored Stop or MENU/ENTER Button pressed**	Can also be reset by higher priority reset conditions.
High	**MENU/ENTER Button pressed**	
Fault Specific		Auto-clears when fault no longer exists.

SPECIFICATIONS

PRODUCT LABEL

Exterior label:

This label informs you of the model/type of the enclosed controller.

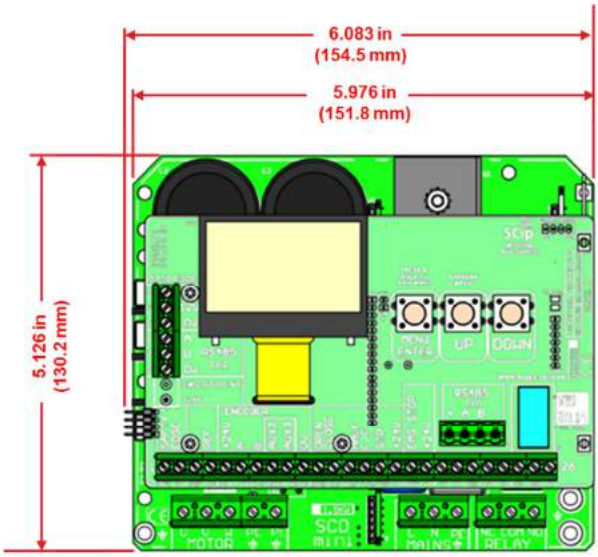
Internal PCB assembly label:

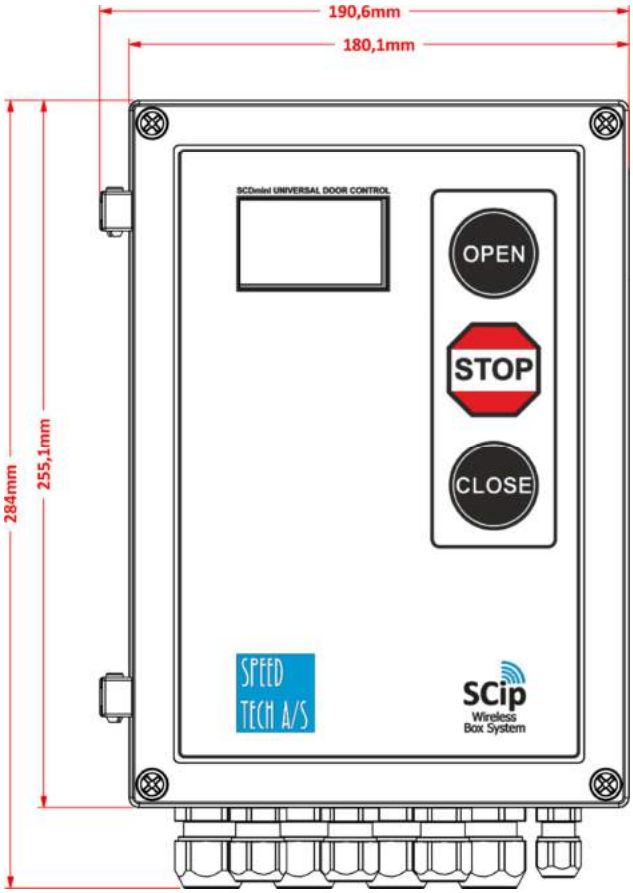
This label informs you of the controller type number, serial number, test at factory date and relevant electrical/environmental specifications.

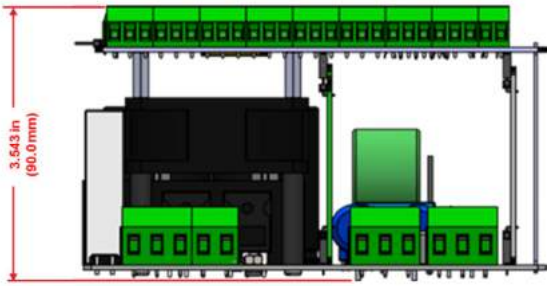
MODEL IDENTIFICATION

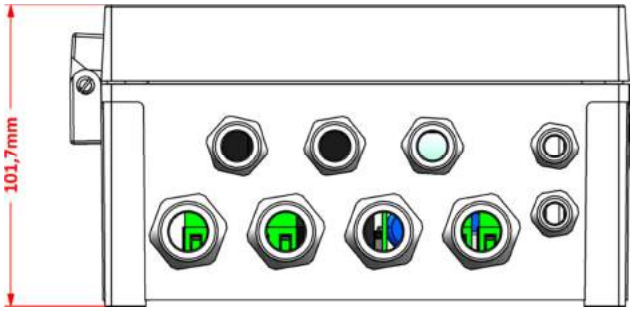
	I out		Mains input		Mains filter	Brake chopper
	3 x 4A	3 x 10A	120VAC (1 Phase)	230VAC (1 phase)		
DG-Mini 750G-120	●		●		●	●
DG-Mini 750G	●			●	●	

MECHANICAL DIMENSIONS









TECHNICAL SPECIFICATIONS

IP Rating:		NEMA 4X
Cooling:		Internal fan
Altitude:		Contact supplier for installations in high altitude locations
Humidity:		<90% (Non-condensing)
Ambient Operating Temperature:		-10°C to 40°C
Mains Input Voltage:		120V -10% +6%, 50-60Hz
		230V 10% +6%, 50-60Hz ***Note: Use mains filter from Block type: B 1309105 to comply with EN61000***
Internal Power Supply:		+24V – 0.5A – Fused - Monitored +12V – 0.2A – Current limited - Monitored
	Terminal #	Description
Outputs:	28	12V output for O.S.E. safety edge
	19	Exclusively used for signals to photo transmitter
	24, 25, 26 (Relay)	Max: 1A - 24V DC / 0.5A - 120V AC
	Power relay (on bottom PCB)	Max: 5A - 240V AC
Digital Inputs:	11 to 15	12 -24V DC compatible.
	6, 7	Quadrature inputs for encoder or standard digital inputs
Analog Inputs:	21	Exclusively used for analog signals from photoeye receiver
Safety Inputs:	1, 2	Safety Edge input for monitored edge. N.O. – Cat. 2
	27, 28, 29	O.S.E. Safety edge (opto edge terminal)
	19, 20, 21	Photoeye / Light Curtain Input – Cat 2 /P.L. d
	17	Monitored stop
Communications:	RS485 CH1 (Standalone connector)	RS485 communications. Internally terminated with 120 Ohms
	30, 31 (RS485 CH2)	RS485 communications for encoder communications. Internally terminated with 120 Ohms

APPENDIX

REPAIR AND MAINTENANCE

WARNING! ELECTRICAL HAZARD!
Always disconnect mains supply and wait for 5 minutes before servicing the high voltage connections of the motor or the door controller.

WARNING! LETHAL VOLTAGES INSIDE!
Do not take the controller apart or attempt to repair it, dangerous voltages exist inside.

Do not take the controller apart or attempt to repair it, this is related to serious danger and is a task for a qualified technician only.

Please contact the manufacturer if you require technical support or if the product is damaged.
This product should be disposed and treated as WEEE (Waste Electrical and Electronic Equipment).

For additional technical assistance, contact:
BTR Controls Inc.
1570 Todd Farm Road
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