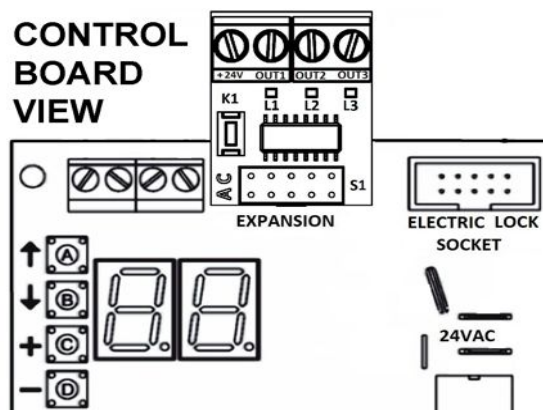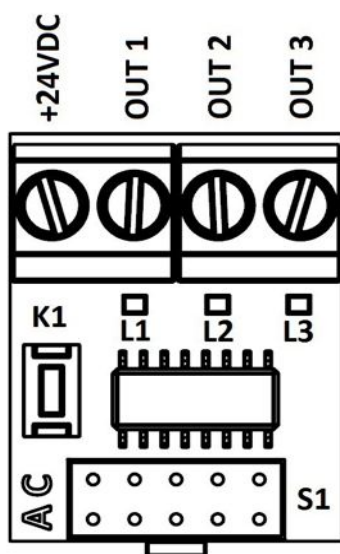# QK-SMARTM
Smart home module for QK-CE220BATRL4 and QK-CE220RL4

IMPORTANT NOTICE:
QK-SMARTM module is compatible with following control boards:
- QK-CE220RL4 control board for sliding gate motors, starting from version V18 (sw. HS2121) onward.
- QK-CE220BATRL4 control board for swing gate motors, starting from version V18 (sw. Hb2114) onward.

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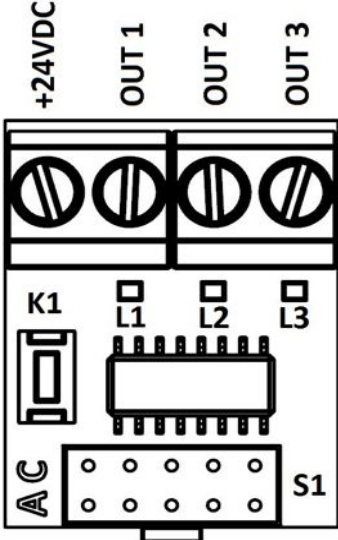
QK-SMARTM EXPANSION

ATTENTION

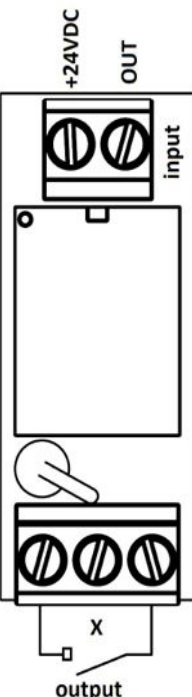**QK-SMARTM module is compatible with following control boards:**

- **QK-CE220RL4** control board for **sliding gate motors**, starting from version **V18 (sw. HS2121)** onward.

- **QK-CE220BATRL4** control board for **swing gate motors**, starting from version **V18 (sw. Hb2114)** onward.

The **QK-SMARTM** expansion consists of a **QK-SMARTM** MODULE and up to three **QK-RELAY** MODULES. The **QK-SMARTM** module expands the control board with three open collector outputs. Each output controls a relay module. The **QK-SMARTM** module has a **push-button K1** to select the outputs menu and three LEDs: **L1, L2** and **L3**. Each LED is linked to a relay status. The LED is ON when the corresponding RELAY output is closed . The **QK-SMARTM** expansion may be used to control a variety of different applications, as for instance *timed lights controlled by remote*, *courtesy lights*, *flashing lamp*, *electric-lock*, *traffic lights*, and *extending an alarm system*. **QK-SMARTM module and QK-RELAY relay are ordered separately.**
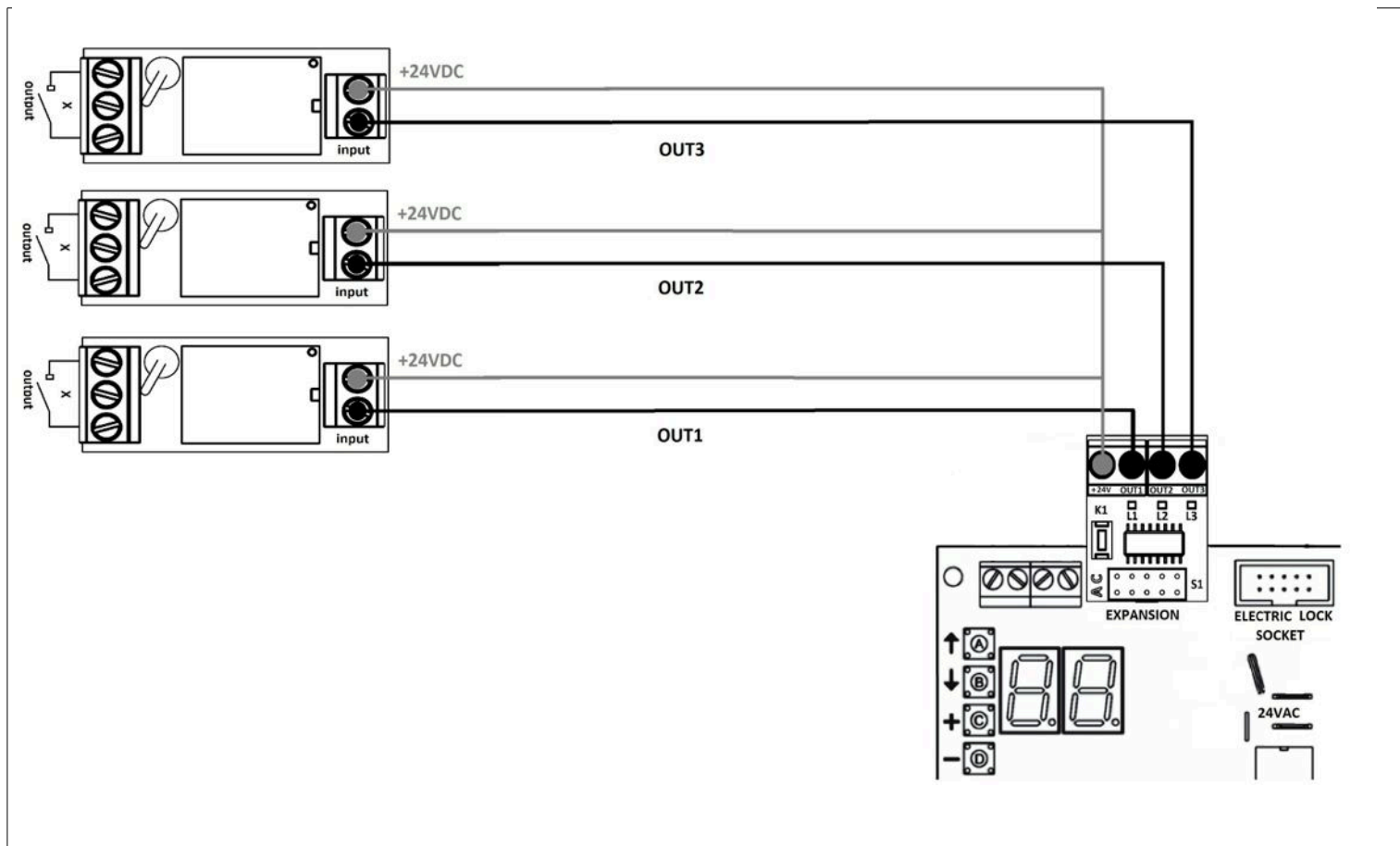
QK – SMARTM

+24VDC	**24 VDC 150 mA**	
OUT1	**OPEN COLLECTOR OUTPUT 1** *24VDC - 40 mA*	
OUT2	**OPEN COLLECTOR OUTPUT 2** *24VDC - 40 mA*	
OUT3	**OPEN COLLECTOR OUTPUT 3** *24VDC - 40 mA*	
L1	**OUTPUT 1 LED**	
L2	**OUTPUT 2 LED**	
L3	**OUTPUT 3 LED**	
K1	**MENU SELECT PUSH-BUTTON**	
S1	**CONNECTION SOCKET** *INSTALL ON CONTROL BOARD EXPANSION SOCKET*	

QK – RELAY (to be ordered separately)

INPUT	**+24VDC**	WIRE TO **QK-SMARTM +24VDC**	
	OUT	WIRE TO **QK-SMARTM OUT1** or **OUT2** or **OUT3**	
OUTPUT	**120/240 VAC**		**7A**
	12/30 VDC		**7A**

CONNECTIONS

In the figure below is shown the connection of three relay modules with the QK – SMARTM module installed on control board expansion socket.

TYPICAL APPLICATIONS

	LIGHT
	The light can be controlled by: terminal block input, remote key and gate status. The most useful functions are: ON, ON/OFF, ON from 0 to 99 Seconds / Minutes / Hours. QK-SMARTM controls up to 3 lights. The lights can be controlled with a single command with different function for each output (I.E. Turn On output 1 and Turn Off output 2).
	ELECTRIC-LOCK
	For this application you need of an **external dc power supply** and an **electric-lock**. The electric-lock can be controlled by terminal block input, remote key and gate status. This application can be used to control additional electric-lock.
	EXTERNAL DEVICE
	A control board with the QK-SMARTM module can command one or more external devices. The command can be sent by terminal block input, remote key and gate status. For instance this application can be used to open or close more devices at the same time.
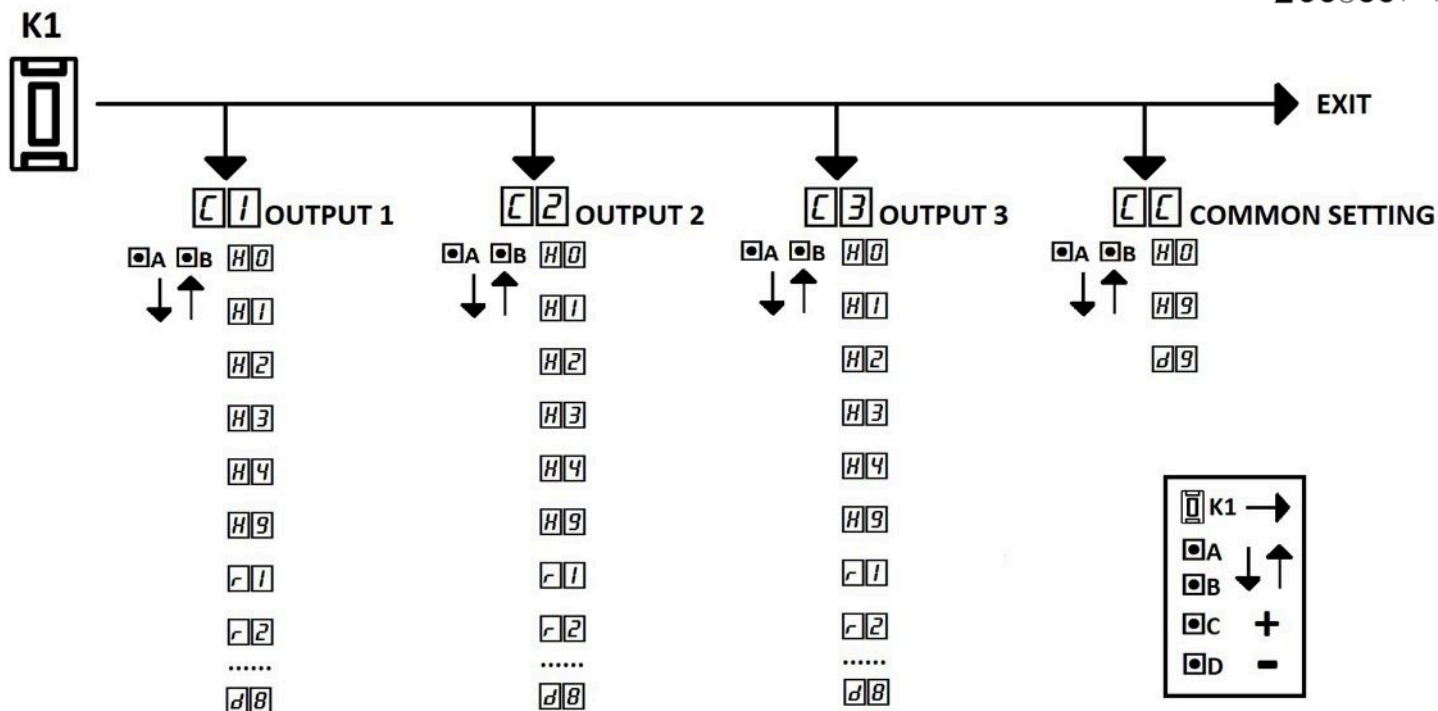
MENUS

Each output has its own menu. C1/C2/C3 are the menu of output 1/2/3 respectively. The **common settings menu** CC acts on all outputs. The **output menu** acts only on its output. To select a menu press **K1 button**. To enter a menu press **A or B button.** Use **C or D button** to modify the settings . During programming all events are disabled, the outputs and LEDs are set to OFF. After programming may be necessary to restart the control board to make the settings effective. The programming phase starts when the A, B, C, D or K1 button is pressed.

EVENTS

Each output (C1, C2, C3) has the same settings. This settings allows to start a function after an event is detected. These function are called **SMART functions**. An event is a change in the control board status. For instance the gate opening, the pressing of remote key or switching of key selectors are events. The events are based on classes. You can distinguish events and functions of a class by a letter displayed. For instance the letter G identifies the events of gate status.

EVENT CLASS	DESCRIPTION
H	**H-TYPE** events are generated when a **H-Type remote key** is pressed. The H-Type remote are all remote keys stored using the functions H1, H2, H3 or H4. They are called **SMART remote** also. A **SMART remote key** can be stored on more outputs with different **SMART functions**. The **SMART remote** keys do not start the gate movement.
r	**R-TYPE** events are generated when a **R-Type remote key** is pressed. The R-Type remote are all remote keys stored using the functions r1 start, r2 stop, r3 pedestrian start or r4 fast closure start in the **standard menu**. They are called **STANDARD remote** also. The **SMART functions** are set in the **output menu** using r1, r2, r3 or r4 parameters. All **STANDARD remote** of a type (I.E. r2 stop) can start different **SMART functions** on outputs. The **STANDARD remote** change the status of the gate.
E	**E-TYPE** events are generated when an **input terminal block** is activated. The **gate working functions** like open or close are set in the **standard menu** using E1, E2, …, E7 parameters. The **SMART functions** are set in the **output menu** using E1, E2, …., E7 parameters.
G	**G-TYPE** events are generated from the control board state. The states are: G1 **turning on**, G2 **opening**, G3 **closing**, G4 **waiting for closing** (pause time), G5 **stop-opening** or **stop-closing**, and G6 **closing end**.

To enter in the standard menu: press **A** or **B** when the display show -- or one of inputs like stop(St).
To enter in the output menu: press **k1** to select the menu C1, C2, C3 or CC. Press **A** or **B** to enter.

Each event can be linked to a **SMART function**. The **SMART functions** are:

DISPLAY	SMART FUNCTION	DESCRIPTION
no	DISABLED	Event disabled. It does not have any effect.
01	ON - OFF	Event switches output value between ON and OFF.
02	ON	Event sets output to ON.
03	OFF	Event sets output to OFF.
04	ON WHILE SOURCE IS ACTIVATED	While the source is activated the output is ON. When the source is inactive the output is OFF.
05	SUSPEND OFF WHILE SOURCE IS ACTIVATED	The current function is suspended and the output is set to OFF while the source is activated.
06	FAST BLINKING	Output ON for 0.3 seconds, OFF for 0.2 seconds.
07	SLOW BLINKING	Output ON for 0.6 seconds, OFF for 0.4 seconds.
08	ON FOR $t1$ SECONDS	output on for $t1$ seconds. Min-Max value: 0-99.
09	ON FOR $t2$ MINUTES	output on for $t2$ minutes. Min-Max value: 0-99.
10	ON FOR $t3$ HOURS	output on for $t3$ hours. Min-Max value: 0-99.
11	ON FOR $t3$ HOURS $t2$ MINUTES	output on for $t3$ hours $t2$ minutes.

EVENTS ROUTING

Select the output $C1$, $C2$ or $C3$ pressing **K1**. Select the event pressing **A** or **B**. Select the **SMART** function pressing **C** or **D**. When the event is generated the **SMART function** starts.

EXAMPLE	Turn On/Off the output 1 pressing a push-button wired on input 1

Press **K1** to select **output 1** menu. When display shows $C1$ press A or B to enter in the output 1 menu. Select the event $E1$ by pressing A or B. When the display show $E1$ press C or D and set the SMART function 01 ON/OFF.
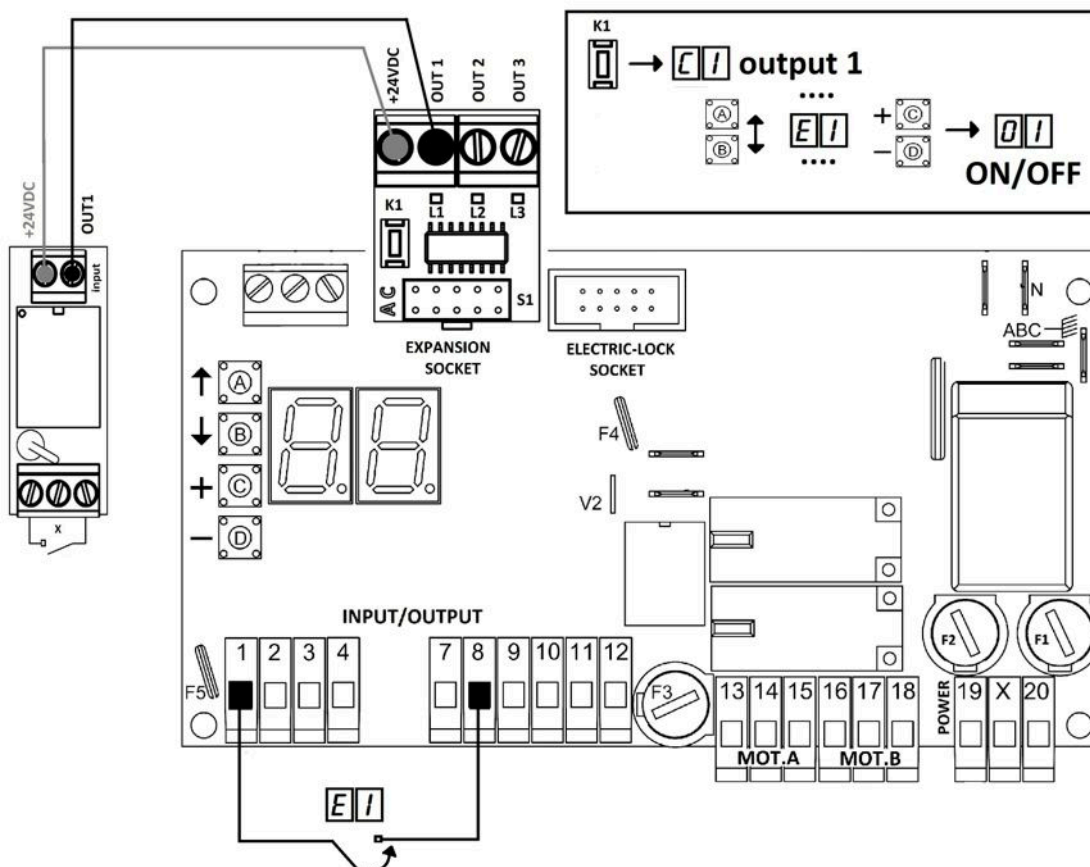
Each output menu contains the same events, functions and data. In the table below are listed all events, functions, and data of an output.

DISPLAY	EVENT	FUNCTION	DATA	DESCRIPTION
H0		ERASE		**ERASE SMART REMOTE KEY:** Select the **output menu** C1, C2 or C3. Select H0 function. The display shows the remote key IDs stored on the output. To erase, hold down **C** button when the display shows the desired ID. The display blinks. When the display is off the remote key is erased.
H1 … H4	**H – TYPE** *SMART REMOTE*	STORE/SET		**STORE SMART REMTOE KEY:** Select the **output menu** C1, C2 or C3. Select H1, H2, H3 or H4. Hold down the remote key and press the C button. The display shows the remote ID. **SET SMART FUNCTION** : Select the **output menu** C1, C2 or C3. Select the function: H1, H2, H3 or H4. **Hold down D** button. The display blinks showing the selected function. When the display stops blinking release D button. Press C or D button to set the **SMART function** from no to 11.
H9		ERASE ALL		**ERASE ALL SMART REMOTE KEYS:** Select the **output menu** C1, C2 or C3. Select H9 function. Press C button. The display blinks showing S1. When the display stops blinking showing S1, the erasing is complete.
r1 … r4	**R - TYPE** *STANDARD REMOTE*	SET		The **STANDARD remote** are r1 **start**, r2 **stop**, r3 **pedestrian start**, and r4 **fast closure start**. **SET SMART FUNCTION** Select the **output menu** C1, C2 or C3. Select the function: r1, r2, r3 or r4. Press C or D button to set the **SMART function** from no to 11. *The storing and erasing function are available in the classic menu.*
E1 … E7	**E - TYPE** *TERMINAL BLOCK INPUT*	SET		**SET SMART FUNCTION** Select the **output menu** C1, C2 or C3. Select the function: E1 **input1**, E2 **input 2**, E3 **input 3**, .. E7 **input 7**. Press C or D button to set the **SMART function** from no to 11.
G1 … G6	**G-TYPE** *GATE STATUS*	SET		**SET SMART FUNCTION:** Select the **output menu** C1, C2 or C3. Select the **G-type** parameter: G1 **turning on**, G2 **opening**, G3 **closing**, G4 **waiting for closing** (pause time), G5 **stop-opening/closing**, G6 **closing end**. Press C or D button to set the **SMART function** from no to 11.
t1 t2 t3		+ -	**TIMER** MIN MAX 00 99	t1 → **SECONDS** t2 → **MINUTES** t3 → **HOURS** **+/-:** Select the **output menu** C1, C2 or C3. Select the timer t1, t2 or t3. Press C to increase by 1. Press D to decrease by 1.
PH Pr PE PG		+ -	**SOURCE PRIORITY** MIN MAX 01 05	Each event type has a programmable priority. PH sets the priority of H-type remote controllers, PE sets the priority of inputs terminal block, Pr sets priority of standard type remote controllers, and PG sets priority of gate status. When two or more sources are active, only the function linked to highest priority source will be set. **+/-:** Select the **output menu** C1, C2 or C3. Select PH, Pr, PE or PG. Press C to increase by 1. Press D to decrease by 1.

Each output menu contains the same events, functions and data. In the table below are listed all events, outputs and data of output.

DISPLAY	EVENT	FUNCTION	DATA	DESCRIPTION
o̅H̅ o̅r̅ o̅E̅		ENABLE DISABLED	OPTION MIN MAX 00 01	**ENABLE/DISABLE KEEP COUNTING OPTION:** Select the output menu C̅1̅, C̅2̅ or C̅3̅. Select the option o̅H̅, o̅r̅ or o̅E̅. Press C to set 0̅1̅ (enabled) or Press D to set 0̅0̅ (disabled). When one of following **SMART functions**: 0̅8̅, 0̅9̅, 1̅0̅ or 1̅1̅ is running and this option is enabled the counter is reset only from events with higher priority. This option can be enabled for these class events: H-TYPE, R-TYPE or E-TYPE.
d̅1̅ … d̅8̅		SET		**SET A PRE-PROGRAMMED CONFIGURATION**: Select the **output menu** C̅1̅, C̅2̅ or C̅3̅. Select the **configuration** from d̅1̅ to d̅8̅. Press C button. The display blinks showing the selected configurations. When the display shows the output menu C̅1̅, C̅2̅ or C̅3̅ the configuration is set. There are eight per-programmed configurations. Each configuration can be used to manage an application. The applications are: d̅1̅ **Timed light** is used to control a light with a remote key. Store a SMART remote key with following functions for: • H̅1̅→ ON/OFF • H̅2̅→ ON for 90 seconds. • H̅3̅→ ON for 60 minutes. • H̅4̅→ ON for 12 hours. d̅2̅ **Flashing lamp** At opening/closing the flashing lamp blinks rapidly/slowly. at pause time the flashing lamp is ON. the flashing lamp is OFF When the photocells beam is broken, otherwise is OFF. d̅3̅ **Electric-lock**. The electric-lock is activated for 3 seconds when: • The gate starts opening. • A remote key stored with H̅2̅ functions is pressed. d̅4̅ **Alarm** configures the photocells as extension of an existing alarm system. When the gate is closed and a photocell beam is broken the output will be ON for 3 seconds. Press a remote key stored using H̅2̅ function to set the output ON for 3 seconds. d̅5̅ **Courtesy light** is used to control a light from more sources: gate status, photocells or remote. When the gate is opening/closing the light is ON. During the automatic closure time the light is ON. In stop-closing or stop-opening state the light is ON for 3 minutes. When a photocell beam is broken the light is ON for 30 seconds. Store a SMART remote key with following functions for: • H̅1̅→ Turn ON/OFF. • H̅2̅→ Turn ON for 30 seconds. • H̅3̅→ Turn ON for 3 minutes. • H̅4̅→ Turn ON for 1 hours. d̅6̅ **Gate open**: set the output to ON when the gate is open. d̅7̅ **Gate closed**: set the output to ON when the gate is closed. d̅8̅ **disabled**: the output is off. All events are set to n̅o̅ disabled.

The common settings menu acts on all output.

DISPLAY	EVENT	FUNCTION	DATA	DESCRIPTION
`H0`		ERASE		**ERASE SMART REMOTE:** Select common settings menu `CC`. Select `H0` function. The display shows all the remote key IDs stored on all outputs. When the display shown the desired ID hold down C button to erase. The display starts blinking. After the remote key has been erased the display turns off
`H9`		ERASE ALL		**ERASE ALL SMART REMOTE KEYS:** select common settings menu `CC`. Select `H9` function. Press C button . The display blinks showing `51`. When the display stops blinking showing `51` the erasing is complete. **All remote keys are erased on all outputs.**
`d9`		SET		**SET FACTORY CONFIGURATION:** select common settings menu `CC`. Select `d9` configuration. Press C button. The display blinks showing `d9`. After the factory settings have been set, the display shows `CC`. **Output 1 → *timed light* `d1`** Store a SMART remote key with following functions for: • `H1`→ ON/OFF • `H2`→ ON for 90 seconds. • `H3`→ ON for 60 minutes. • `H4`→ ON for 12 hours. **Output 2 → *gate open* `d6`** Set the output 2 to ON when the gate is open. **Output 3 → *gate closed* `d7`** Set the output 3 to ON when the gate is closed.

FACTORY CONFIGURATION

The control board is supplied with the following configurations programmed:

OUTPUT 1 → *timed light* `d1`	OUTPUT 2 → *gate open* `d6`	OUTPUT 3 → *gate closed* `d7`
Store a **SMART remote key** with following functions for: • `H1`→ ON/OFF • `H2`→ ON for 90 seconds. • `H3`→ ON for 60 minutes. • `H4`→ ON for 12 hours.	The output is ON when the gate is open.	The output is on when the gate is closed.

PRE-PROGRAMMED CONFIGURATIONS
For sliding control board

		d1 timed light	d2 flashing lamp	d3 electric lock	d4 alarm	d5 courtesy light	d6 gate open	d7 gate closed	d8 disabled
H1	SMART REMOTE	01 ON/OFF				01 ON/OFF			
H2	SMART REMOTE	08 ON t1 Secs		08 ON t1 Secs	08 ON t1 Secs	08 ON t1 Secs			
H3	SMART REMOTE	09 ON t2 Mins				09 ON t2 Mins			
H4	SMART REMOTE	10 ON t3 Hours				10 ON t3 Hours			
r1	START REMOTE								
r2	STOP REMOTE								
r3	PED. REMTOE								
r4	F.CL. REMOTE								
E1	T.B. INPUT 1								
E2	T.B. INPUT 2								
E3	T.B. INPUT 3		05 SUSPEND		08 ON t1 Secs	08 ON t1 Secs			
E4	T.B. INPUT 4		05 SUSPEND		08 ON t1 Secs	08 ON t1 Secs			
E5	T.B. INPUT 5						03 OFF	02 ON	
E6	T.B. INPUT 6						02 ON	03 OFF	
E7	T.B. INPUT 7								
G1	TURINING ON							02 ON	
G2	OPENING		06 FAST BL.	03 OFF	02 ON		02 ON	03 OFF	
G3	CLOSING		07 SLOW BL.	03 OFF	02 ON		02 ON		
G4	PAUSE		02 ON	03 OFF	02 ON		02 ON		
G5	STOP		03 OFF		03 OFF	08 ON t1 Secs	02 ON		
G6	CLOSING END		03 OFF			09 ON t2 Mins	03 OFF	02 ON	
t1	TIMER SECS	90 SECONDS		03 SECONDS	03 SECONDS	60 SECONDS			
t2	TIMER MINS	60 MINUTES				03 MINUTES			
t3	TIMER HOURS	12 HOURS				01 HOURS			
PH	SMART REMOTE PRIORITY				02	02			
Pr	START - STOP – PED – F.CL. REMOTE PRIORITY								
PE	T.B. INPUT PRIORITY								
PG	GATE PRIORITY				02	02			
oH	SMART REMOTE KEEP COUNTING								
or	START – STOP – PED – F.CL. REMOTE KEEPT COUNTING								
oE	T.B. INPUT KEEP COUNTING								

PRE-PROGRAMMED CONFIGURATIONS
For swing control board

	d1 timed light	d2 flashing lamp	d3 electric lock	d4 alarm	d5 courtesy light	d6 gate open	d7 gate closed	d8 disabled
H1 SMART REMOTE	01 ON/OFF				01 ON/OFF			
H2 SMART REMOTE	08 ON t1 Secs		08 ON t1 Secs	08 ON t1 Secs	08 ON t1 Secs			
H3 SMART REMOTE	09 ON t2 Mins				09 ON t2 Mins			
H4 SMART REMOTE	10 ON t3 Hours				10 ON t3 Hours			
r1 START REMOTE								
r2 STOP REMOTE								
r3 PED. REMTOE								
r4 F.CL. REMOTE								
E1 T.B. INPUT 1								
E2 T.B. INPUT 2								
E3 T.B. INPUT 3		05 SUSPEND		08 ON t1 Secs	08 ON t1 Secs			
E4 T.B. INPUT 4		05 SUSPEND		08 ON t1 Secs	08 ON t1 Secs			
E7 T.B. INPUT 7								
G1 TURINING ON							02 ON	
G2 OPENING		06 FAST BL.		03 OFF	02 ON	02 ON	03 OFF	
G3 CLOSING		07 SLOW BL.		03 OFF	02 ON	02 ON		
G4 PAUSE		02 ON		03 OFF	02 ON	02 ON		
G5 STOP		03 OFF		03 OFF	08 ON t1 Secs	02 ON		
G6 CLOSING END		03 OFF			09 ON t2 Mins	03 OFF	02 ON	
t1 TIMER SECS	90 SECONDS		03 SECONDS	03 SECONDS	60 SECONDS			
t2 TIMER MINS	60 MINUTES				03 MINUTES			
t3 TIMER HOURS	12 HOURS				01 HOURS			
PH SMART REMOTE PRIORITY				02	02			
Pr START - STOP – PED – F.CL. REMOTE PRIORITY								
PE T.B. INPUT PRIORITY								
PG GATE PRIORITY				02	02			
oH SMART REMOTE KEEP COUNTING								
or START – STOP – PED – F.CL. REMOTE KEPT COUNTING								
oE T.B. INPUT KEEP COUNTING								

![quiko opening solutions logo]

Quiko Italy
Via Seccalegno, 19
36040 Sossano (VI) - Italy
Tel. +39 0444 785513
Fax +39 0444 782371
info@quiko.biz
www.quikoitaly.com

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