Output Control With Macros and Scenes

Introduction

With the V2.28.00 firmware release we have introduced support for output control using macro and scene functions.

The system provides supports 8 unique macros with each macro rule comprising up to 20 characters. Each macro can be given a unique name for easy identification in the system.

Macros can be used to solve complex output control functions that are not available using standard output event types. In many cases macros will reduce the number of outputs required to perform an output function and simplify output wiring while the new scene function allows you to construct a set of rules that are actioned when the corresponding macro is true. Scene rules comprise up to 16 characters. You might say that the macro rule defines the inputs required to make the macro true while the scene defined what actions are performed when the macro is true.

Features

All macro rules are processed from left to right and when all conditions are met, the macro is said to be True. Currently there is no support for grouping functions in the macro rule using brackets however it is possible to use the result of one macro in the rule for another macro.

(A1&A3) | (A2&A5)	Not Allowed
M1&A3|A4	Allowed

Macro Rules

Only the following operand characters are supported when constructing macro rules in firmware version V2.28.00.

MACRO RULES			
Rule Character (Operand)	**Variables**	**Character Represents**	**Usage**
O	1 - 40	Output	Check if an output is triggered
A	1 - 16	Area	Check if an area is armed
P	1 -16	Part 1	Check if an area is armed in Part Mode 1
Q	1 -16	Part 2	Check if an area is armed in Part Mode 2
M	1 - 8	Macro	Check if a macro is true
T	1 -16	Time Zone	Check if a time zone is true
H	1 - 8	Holiday	Check is a holiday is true
Z	1 - 144	Zone	Check if a zone is unsealed
D	1 -16	Door	Check if a door is unlocked / operated
F	1 - 10	RF KeyFob	Check if an RF Keyfob button is pressed or held down for 2 seconds
K	1 -16 U,D,L,R Arrow Buttons ↑ ↓ ← →	Keypad Button	Check if a ↑ ↓ ← → button on a keypad has been pressed and held down for 2 seconds.

Table 1: Macro Rules Characters

Note

RF Keyfob hold down functions are linked to variables 6, 7, 8, 9 and 10. Only the SMART RF 5 Button Keyfob (RF110) can be used as a macro variable. Other keyfobs are not supported.

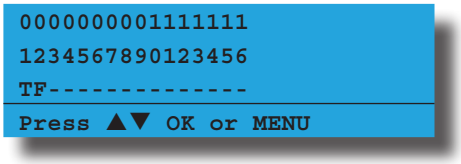
The following macro rule operators are available in firmware version V2.28.00.

Operator Character	Operator Meaning	Usage
&	And	Used to AND variables
|	Or	Used to OR variables
!	Inverted Function	Used to trigger in the opposite state

Table 2: Macro Operator Characters

Macro Array

The new Macro Array menu can be used to show the current state of each macro in the same way the zone array is used to show the status of zones. MENU 4-0-6 Macro Array will show a T when the macro result is True, an F when the macro result is false and a - when the macro hasn't been configured. The macro will be true when all conditions in the macro rule have been met.



Operating An Output Based On A Macro Rule

To operate an output based on a Macro rule the following programming steps are required.

1) Name and configure the Macro in MENU 4-8-1 and MENU 4-8-2.

2) Choose the output to operate when the macro is TRUE and set the output event type to 75 - Macro.

3) Set the output event assignment to the macro you wish to use. Eg. Set 1 for Macro 1.

4) The output will now operate whenever the Macro is TRUE. Once triggered, the output will follow the time parameter programmed regardless of the Macro state if one has been set.

Macro Rule Examples

Following is a list showing examples of how each macro rule character can be used.

Macro Rule	Meaning
Z1	The macro will be true if Zone 1 if triggered or unsealed.
!Z1	The macro will be true if Zone 1 is sealed.
Z1 & A1	The macro will be true if Zone 1 is triggered or unsealed when Area 1 is armed.
Z1 & !A1	The macro will be true if Zone 1 is unsealed when Area 1 is disarmed.
Z2 & !A1 & D1	The macro will be true if Zone 2 is unsealed when Area 1 is disarmed and Door 1 is unlocked.
Z1 | A1	The macro will be true if Zone 1 is unsealed or when Area 1 is armed.
!Q2	The macro will be true if Area 2 is not armed in Part Mode 2.
P1 & P2	The macro will be true if Area 1 and Area 2 are both armed in Part Mode 1.
F3	The macro will be true if button 3 on an RF Keyfob is pressed
K7R	The macro will be true if the right arrow button is pressed and held down on keypad 7 only.

Table 3: Macro Operator Characters

Note

Spaces have been included in the macro rule examples in this document however spaces should not be added when creating a macro or scene rule.

Scene Rules

Only the following operand characters are supported when constructing scene rules in firmware version V2.28.00.

SCENE RULES			
Rule Character (Operand)	**Variables**	**Character Represents**	**Usage**
O	1 - 40	Output	Turn Output On (s)
!O	1 - 40	Output	Turn Output Off (s)
A	1 - 16	Area	Arm Area (s)
!A	1 - 16	Area	Disarm Area (s)
P	1 - 16	Area	Arm Area (s) in Part Mode 1
!P	1 - 16	Area	Disarm Area (s) from Part Mode 1
Q	1 - 16	Area	Arm Area (s) in Part Mode 2
!Q	1 - 16	Area	Disarm Area (s) from Part Mode 2
Z	1 - 144	Zone	Bypass Zone (s)
!Z	1 - 144	Zone	Unbypass Zone (s)
D	1 - 16	Door	Operate Door (s)
!D	1 - 16	Door	Lock Door (s)

Table 4: Scene Rules Characters

Rule characters M (Macro), H (Holiday), F (RF Keyfob) and K (Keypad Button) are not currently supported in scene rules in firmware version V2.28.00.

Scene Rule Examples

Following is a list showing examples of how each scene rule character can be used. When the associated macro is true the scene action will run.

Scene Rule	Meaning
Z1	The scene will bypass Zone 1.
!Z1	The scene will unbypass Zone 1.
Z1 & A1	The scene will bypass Zone 1 and Arm Area 1.
P1 & P3 & P2	The scene will arm Area 1 and Area 3 in Part Mode 1 and Area 2 in Part Mode 2.
Z1 & !A1	The scene will bypass Zone 1 and disarm Area 1.
Z2 & !A1 & D1	The scene will bypass Zone 2, disarm Area 1 and operate Door 1.

Table 5: Scene Rule Examples

Note

Spaces have been included in the scene rule examples in this document however spaces should not be added when creating a macro or scene rule.

Operate An Output To Control Security Lighting

The following example could be used to operate an output whenever Area 1 and Area 2 are armed and Time zone 2 is true.

1) Configure Time zone 2 (T2) to be true from 7pm until 6am.

2) Configure the Macro Rule as follows, A1&A2&T2.

3) Configure the Output to event type Macro and set the output event assignment to 1 for Macro 1.

--- Macro is TRUE when Area 1 is armed and Area 2 is armed and Time zone 2 is True ---

Operate An Output When Selected Zones Are Triggered

The following example could be used to operate an output whenever a freezer alarm is triggered while the system is disarmed.

1) Configure zone functions to suit freezer output.

2) Configure Macro 1 as follows, !A1&Z13|Z14|Z15

3) Configure the Output to event type Macro and set the output event assignment to 1 for Macro 1.

--- Macro is TRUE when Area 1 is disarmed and either Z13 or Z14 or Z15 is unsealed ---

Man Trap Using Macro's

A man trap is where you have two doors where each door has an in and out reader as well as a zone. The concept is that both doors must be closed before access is granted through either door. The following example explains how using a macro can achieve this feature.

The example assumes a hardware configuration as follows.

Door 1 is going to have reader 1 and reader 2 as well as zone 1.

Door 2 is going to have reader 3 and reader 4 as well as zone 2.

Output 9 is the output connected to the door latch for door 1.

Output 10 is the output connected to the door latch for door 2.

Zone 1 is fitted to door 1

Zone 2 is fitted to door 2

Configure the following macros to achieve the Man Trap functionality.

Op9 = Macro 1 = D1&!Z1&!Z2&!D2

Op10 = Macro 2 = D2&!Z1&!Z2&!D1

Op21 = Door 1

Op22 = Door 2

Garage Door Control Using Radio Keyfob and iFob Control App

In this example the customer wants to operate their garage door using an RF keyfob but also wants to use the iFob app. The first approach might be to leave OP5 as default which is Keyfob Function 2 and then enable Guest Control on OP5 so the iFob Control APP can control it as an output.

One issue with this approach is that you don't know if the garage door is actually open or closed from the iFob Control APP. To provide this indication you will need to add a zone to the garage door to reflect the open or closed condition. This approach can work however it is cumbersome to use from the APP and there is a better way using doors and macros as shown below.

The Solution 6000 control panel has a feature where you set an output as a DOOR and then assign or link a zone to the DOOR. Next assign a shortcut to the door in the iFob Control APP and the door open or closed condition will be clearly shown each time the app connects to the panel.

So now you have an output OP5 that operates when the RF Keyfob is used and another output when the iFob app operates the DOOR. This requires 2 outputs both connected to the garage door controller and increases the number of physical outputs required to do the job. This is further complicated when there are multiple doors and gates all requiring the same functionality.

Now using Macros it's easy to setup virtual outputs to do these functions and then link the outputs together using a single Macro.

For this example we will use OP5 to physically connect to the garage door controller and virtual outputs OP20 and OP21. A virtual output is any output that is available from a software point of view but where there is no actual physical output present. Outputs 6, 7 and 8 on the Solution 6000 are examples of virtual outputs.

Then configure the following outputs and macros as shown.

OP5 Event Type = Macro 1

OP20 Event Type = Keyfob Function 2

OP21 Event Type = Door 1

Macro 1 Rule = O20|O21

Macro 1 rule says that whenever Output 20 or Output 21 operates then the Macro will become true and when the macro is true, Output 5 will operate and trigger the garage door motor.

WARNING!

Domestic garage doors typically don't have safety beams and rely on force to detect an obstruction during closing. When operating the doors remotely ensure there are no obstructions before operating. Talk to your installer about options like cameras and safety beams.

Using Scenes

A Scene is made up of one or more actions that will be performed only when the corresponding macro is true. Only one Scene is available for each Macro however the Scene can include multiple actions up to 16 characters long.

One way to think of a scene in relation to the macro is to say that, If these things happen (Macro inputs) and the macro become true then do these things (Scene Outputs).

Some examples using Macros and Scenes are shown below.

Using Macros Provides Single Button Convenience

In this example a customer has an Electric Gate, 2 Garage Doors and 2 Alarm Areas for the house. They are currently using a different RF Keyfob for the Gate, another for the the Garage doors and a third unit to control the alarm system. This is not only inconvenient but is costly to maintain with each user required to have 3 remotes and each one using different batteries etc.

This example will show how using macros and scenes on the Solution 6000 combined with the RF110 SMART RF 5 Button Keyfob can simplify your installation and improve the users experience by reducing daily operation to a single key press on a single remote keyfob.

Step 1) Allocate door numbers to the gate and each garage door. In this example D1, D2 and D3. By doing this the ifob Control smart phone app can also be used to control the doors as and when required.

Step 2) Configure the buttons on the RF110 RF Keyfob to the different functions.

Step 3) Set the Macro and Scene

Step 4) Assign the Users to the Doors

Doors Configuration

D1 = Front Gate (Control by output on Reader)

D2 = User 1 Garage (Op5 - Output 5 configured as one shot polarity)

D3 = User 2 Garage (Op3 - Output 3 configured as one shot polarity)

Areas Configuration

A1 = Main House

A2 = Parents Retreat

Keyfob Button Configuration

F1 = Keyfob Arming

F2 = Keyfob Disarming

F3 = Keyfob Door 1 (Front Gate)

F4 = Keyfob Output 5 (Garage Door 1)

F5 = Keyfob Output 3 (Garage Door 2)

F6 =Keyfob Hold Down Button 1 (Arming)

F7 =Keyfob Hold Down Button 2 (Disarming)

F8 = Not assigned

F9 = Not assigned

F10 = Not assigned

Macro Configuration

Name	Macro	Scene
Macro 2 Name	F6	D3&D1&A1&A2&D2
Macro 3 Name	F7	D3&D1&!A1&!A2&D2

Macro 2 is triggered (is True) by holding down button 1 on the Keyfob for 2 seconds. Once the macro is TRUE the scene is triggered operating the gate (D1), garage door 1 (D2), garage door 2 (D3) and arming both areas. Because User 1 does not belong to D3 (User 2 Garage) the scene only operates User 1 Garage (D2). The scene is following the door assignment rules.

Macro 3 is triggered (Is True) by holding down button 2 on Keyfob for 2 seconds. Once the macro is TRUE the scene is triggered operating the gate (D1), garage door 1 (D2), garage door 2 (D3) and disarming both areas.

Operate Outdoor Lighting After Dark Only If the System Is Armed

1) Configure Time Zone 1 to be true from 6pm until 6am.

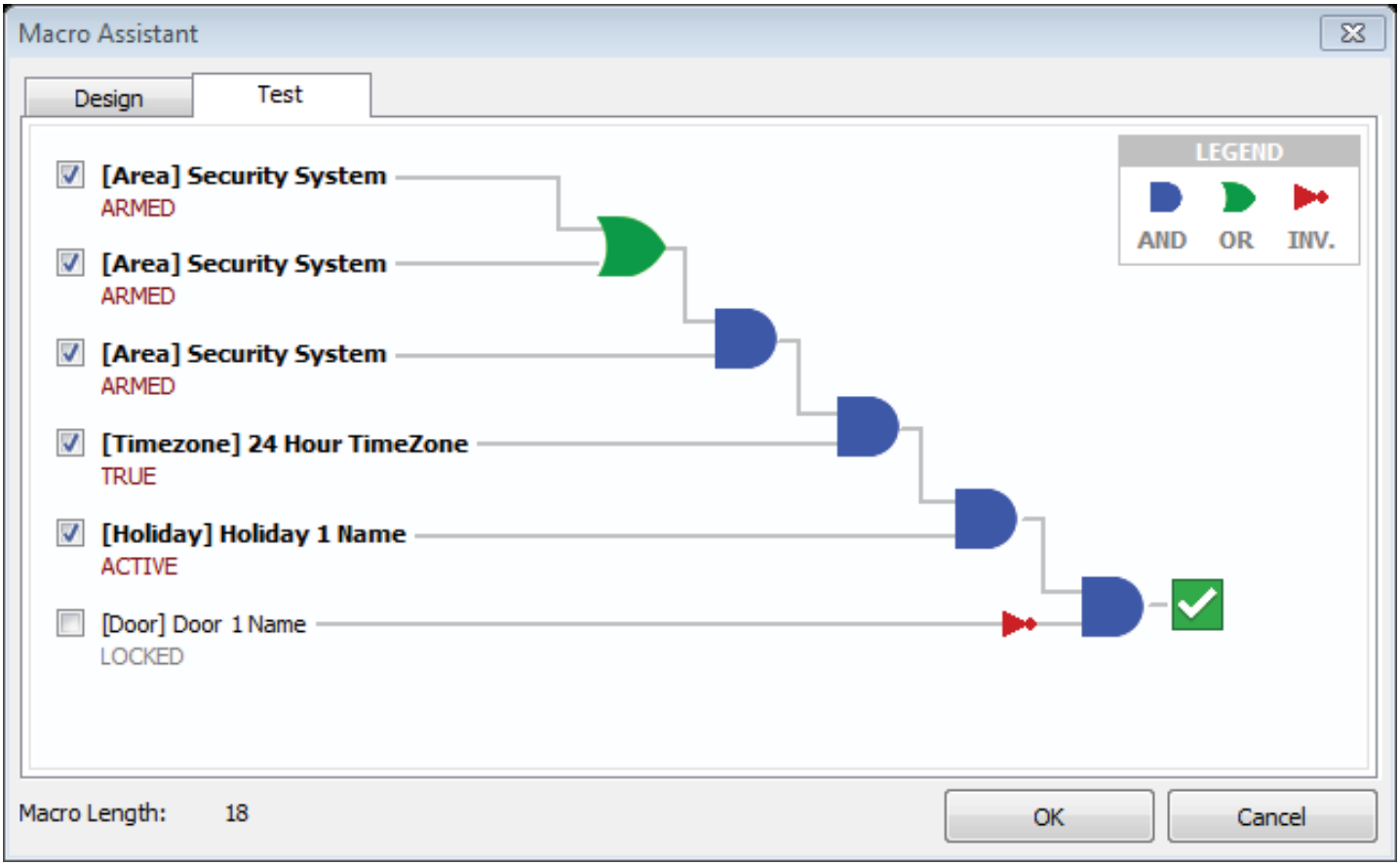
2) Configure Physical Outputs 10, 11 and 12 as required to operate lights.

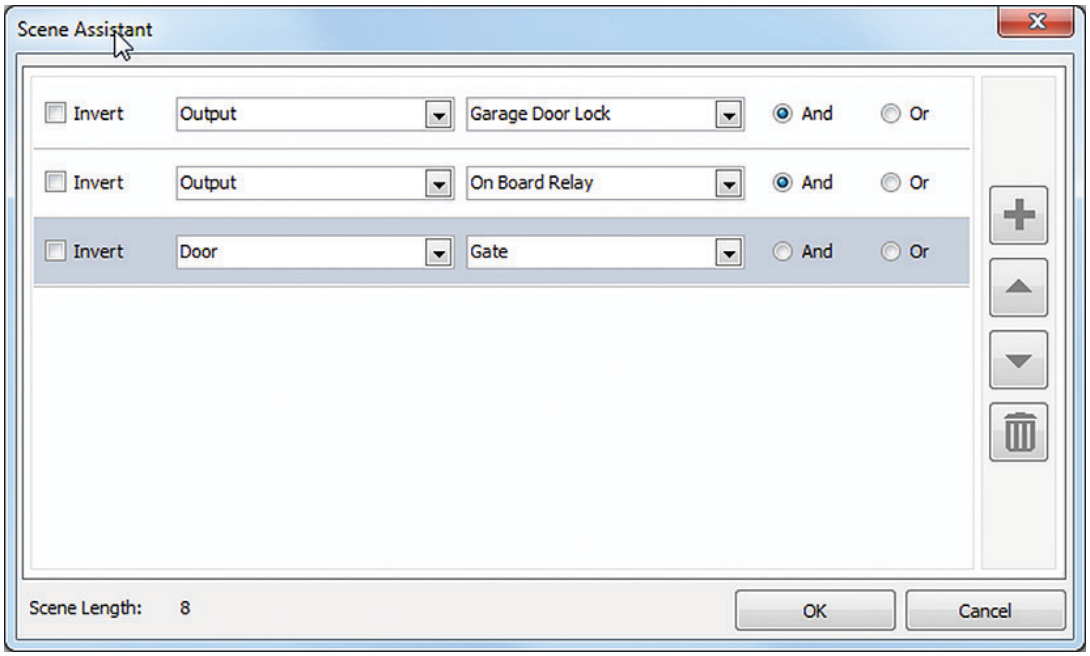
3) Set Macro 1 as TZ1 & A1 & A2

4) Set Scene 1 as O10 & O11 & O12

Solutionlink RAS

Solutionlink has a number of tools to assist in creating macros and scenes. The Macro Assistant helps to ensure your macros are constructed using the correct syntax and it can also be used to test the macro behaviour when the various inputs change state etc. For complex macros or while learning the macro operation we recommend you utilise these tools.





Outputs > Commands >

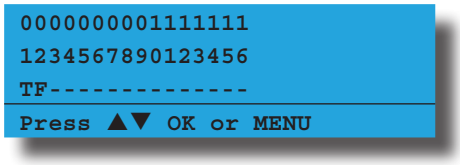
Macro Array I-M **MENU 4-0-6**

This menu allows the master user and installer to view the macro status (Macros 01 to 08). Macros will continuously be updated during the display so that real time status can be seen. The top two rows of the display show the macro number, the third row displays the macro status.

T = TRUE

F = FALSE

- = DISABLED



In the above example screen,

T = Macro 01 is True

F = Macro 02 is False

- = Macro 03 to 08 are Disabled or Not Available

Outputs > Macros >

Name I **MENU 4-8-0**

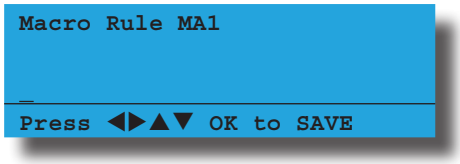
M	a	c	r	o	s		1		N	a	m	e							

This menu allows you to program the name for each macro. A maximum of 8 different macros can be configured. Macro names can be up to 20 characters long.

Outputs > Macros >

Macro Rule I **MENU 4-8-1**

This menu allows you to program the rule for each macro. A maximum of 8 different macros can be configured. Macro rule can be up to 20 characters long.



Outputs > Macros >

Scene I **MENU 4-8-2**

Each scene follows their corresponding macro. A maximum of 8 different macros can be configured. A scene allows the control panel to operate multiple outputs and doors when the macro is true.

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