



Vuolas Electronics Oy Ltd.

Part No.	S2DM30, 2DM30, 3DM30, 2DM50, 3DM50
Description	Dot Matrix Display Device for Lifts
Software	Ver. 3.1
Documentation	Rev. 3.1

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Introduction

Note Available features depend on purchased device version. All here described features are not available in all device versions.

DM-series is a microcontroller based dot matrix display unit family, which includes 2 and 3 digit led displays with 30mm or 50mm of height. Devices are optimized for lift applications. They can be assembled either to the car or to the level. They can present floor markings, direction arrows and indicators. Also versions with 3-tone standard gong audio feature are available, sound differs according to cars moving direction. Devices accept wide range of nominal supply voltages; this is possible because they are equipped with high efficiency on board switched mode power supply (SMPS). Advanced digital filtering enhances robustness in poor signal quality environments.

S2DM30 differs a little from the other models. The fundamental idea behind the S2DM30 is having a considerably small 2-digit device, yet having almost all features that 3-digit models have. The audio feature is not available for it.



Arrows, floor markings and indicators

Arrow symbols that indicate lift movement are displayed on the leftmost digit. Floor markings indicate car position in a user understandable way, they are shown on the two rightmost digits (on one digit in two digit device versions). Device can also display 2-digit symbols to indicate out of service and overload situations; these indicators are displayed on the two rightmost digits.

Here the function of S2DM30 differs from the other models. Arrows and floor markings are not displayed simultaneously, but in turns. This makes it capable of showing 2-digit floor markings (with the total of 2 digits it has).

As a factory default the floor markings are: 0 for the level 0, 1 for 1, etc. but this is fully customer configurable. All numerals 0...9, letters A...Z and following special characters: space _ - () * + , . / : ; can be used in floor marks.

Movement of arrows can be either automatic or externally controlled. External arrow controls share the same inputs with indicators (J2/8...9), so it is not possible to use both the external arrow control and the indicators in the same installation.

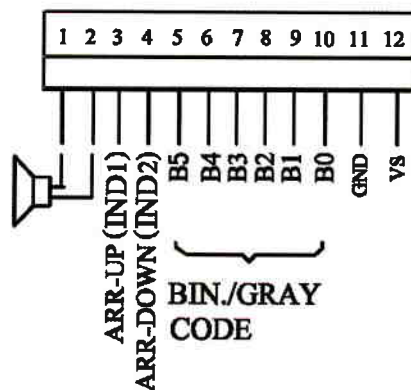
When the automatic arrow function is selected, the microcontroller continuously observes the car position status input. In case of any change it evaluates the direction of car movement and presents arrows pointing and scrolling to that direction. Floor markings scroll together with the arrow; the current floor marking makes room for the new one. After one cycle of scrolling, floor markings stop and the arrows are blanked. Scrolling time is customer configurable, in order to match the speed of the lift approximately.

When the externally controlled arrow function is selected, arrows scroll according to the control. Floor marking is not moving; it changes immediately whenever the car position code changes. Input IND1 activates scrolling up and IND2 activates scrolling down. If both IND1 and IND2 are active, an immobile up/down arrow symbol is shown.

The device can display 2 different 2-digit indicators according to control of 2 indicator inputs IND1 and IND2. If both inputs are active, indicator 2 is displayed. Indicator symbols are customer configurable.

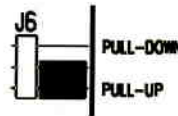
Electrical connections

The device is connected through a 12-pin detachable connector (J2). It has 6 inputs (J2/5...10) for position status and 2 inputs (J2/3...4) for symbol indications (or alternatively arrow scrolling). Speaker is connected to J2/1...2, supply voltage to J2/12 and J2/11 is GND. Refer to electrical specifications for voltage levels and other details.



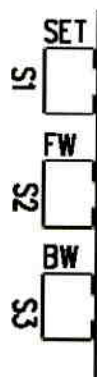
Jumper settings

Jumper J6 should be set to match the input signal polarity. It switches the input resistors to pull up or pull down. The device also adapts to different input polarities automatically according to jumpers position.



Setup menu

With aid of setup menu a user can make changes to the certain properties of the display device. Three push buttons are assigned to browsing of the menu. Pressing the SET push button for at least 3 seconds activates the setup menu.



Setup menu:

- V Gong volume (1...4)
- M Installation position selection (C(ar)/L(anding))
- C Input coding (B(inary)/G(ray))
- L Level of assembly, if in landing-mode (0...31)
- S Scrolling time (1...5)
- A Select IND1 and IND 2 control: arrow scrolling / indicators
- X IND1 indicator symbol
- Y IND2 indicator symbol
- O Floor marks (BUS 00...BUS 31)

Buttons FW (forward) and BW (backward) are used for browsing the menu. One menu item at a time is shown. Setting of the shown item can be changed immediately by pressing SET button. Setting will step to next value by each pressing (and after the last value jump back to the first one). Displayed value is also stored to memory immediately. So the latest shown value is valid, when leaving the item by continuing menu browsing. If no key is pressed for 10 seconds the device returns from setup menu to standard display mode.

In 2-digit versions is not displayed X and Y prompts, but both digits of indicator symbols.

Floor marks menu is in fact a “sub menu”, consisting of 32 items. When this sub menu is entered, FW and BW buttons don't any more browse main menu items, but sub menu items. Only way back to the main menu is to return to the standard display mode by switching power off and on or by waiting (for 10 seconds) and then entering the setup menu again.

In 3-digit and S2 versions floor marks consists of up to two characters. When browsing the sub menu forwards by FW button, first is activated the first character of the floor marking (character can be now changed by pressing SET button), next pressing of FW button directs editing to the second character. Pressing FW button again, activates the first character of next floor marking, and so on.

Note In setup menu car position code is always presented by one digit; first 10 with numbers and remaining 22 with alphabets: 0,1,2...9,A,B,...V. An exception is S2DM in which car position code is not at all presented, because a 2-digit floor marking takes the both available digits.

Test modes

Testing of the gong is easy. In normal mode, press BW button to make the gong sound. This can be used e.g. to verify that loudspeaker is properly connected.

Display test starts by pressing the FW button in normal mode. Test pattern changes as a result of each consecutive pressing. After the last pattern, software version is displayed.

Configuration copy function

Usually displays in a lift have almost same configuration, only the floor setting varies between displays that are assembled to each landing. After configuring the first device, settings can be copied from it to the other ones automatically via a flat cable. After copying, only settings that differ between devices need to be changed separately for each individual board. In some cases this copying of configurations can save a considerable amount of work.



Copy function is activated every time the set button is pushed shortly, while device is in normal mode (not in setup editor mode). Connect a flat cable between the display units and push the set button of the source unit (one with proper configurations in it). Source unit transfers a copy of its configuration data to the target unit. When transfer is complete and the target device has stored the new configuration it blinks a led in bottom row of its display.

Mechanical assembly

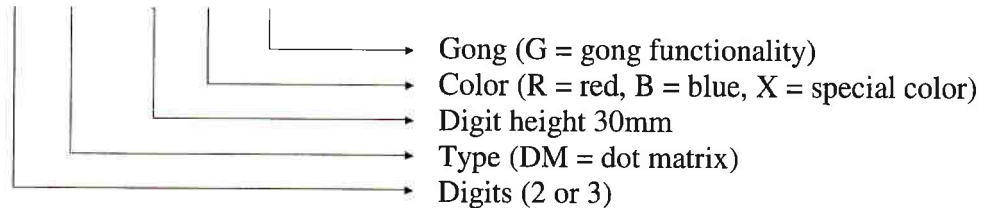
Devices have 4 holes for mounting. Refer to separate device specific mechanical data for accurate positioning of fixing points and display opening.

Please consider space needed for cables and connectors (plugged connectors exceed the outline of the device).

Available versions of DM

Product code

3 DM 30 R G



Examples:

2DM30R 2 digits, 30mm height, red color

3DM50XG 3 digits, 50mm height, special color, gong functionality

In S2DM30R letter “S” stands for “small”. It has 2 digits, 30mm height and red color (gong functionality is not available)

Technical information

Functional specifications

- Available features depend on purchased device version. All here described features are not available in all device versions.
- Intended for lift applications
- Applicable for assembly either to the car or to a level.
- Maximum number of floors is 32
- Presents floor markings, direction arrows and indicators
- Floor mark consists of one or two
 - numbers (0...9) or
 - letters (A...Z) or
 - special characters: space _ - () * + , . / : ;)
- Scrolling of arrows:
 - Can be made automatically
 - Scrolling time is customer configurable.
 - External activation of arrow scrolling is possible (excludes indicators)
- (Optional) audible signaling by a standard gong
 - Different sound depending on direction
 - Upwards 1120Hz
 - Downwards 980Hz and 871Hz
 - Not available for S2D30 model
- Gong volume setting (gong functionality is an option)
 - 30dB adjustment range in 4 steps

Visual specifications

- Display resolution: 2 or 3 pieces of 5 x 7 led matrixes (according to the version)
- Active area:
 - S2DM30x, 30 mm x 48 mm
 - 2DM30xx, 30 mm x 48 mm
 - 3DM30xx, 30 mm x 68 mm
 - 2DM50xx, 50 mm x 85 mm
 - 2DM50xx, 50 mm x 133 mm
- Viewing angle: min. 60°
- Color: Red and blue on stock, special colors available on order

Electrical connections

- Power supply input
 - Operating voltage range, 12...30 VDC (max. 5% ripple voltage)
 - Current consumption, 150...75 mA @ 12...24 VDC (without gong)
- Control interface
 - Internal pull-down or pull-up resistors depending on jumper settings
 - Pull-down/-up resistance: 10 k Ω
 - Input voltage range: 0...30 VDC
 - Logical levels:
 - Logic 0: 0...1 VDC
 - Logic 1: 10...30 VDC
 - Maximum input current: ± 3 mA (depending on input polarity)
 - Parallel mode position input coding is selectable: Binary/Gray
 - 2 indicator control inputs (alternatively configurable to control arrow scrolling)
- Setup copy function interface
- Serial control interface (implementation available through negotiations)
 - Full preparedness in hardware for RS-485 compatible bus connections
 - Functionality to be implemented according to protocol specifications set by customer
- Loudspeaker output
 - Speaker impedance: 8...32 Ω
 - Adjustable volume (setup menu)

Configuration

- Setup menu:
 - Device configuration is made by means of displayed menu and 3 push buttons
 - Covers configuration of:
 - Gong volume (1...4)
 - Installation position selection (Car/Landing)
 - Input coding (Binary/Gray)
 - Level where gong sounds if in landing-mode (0...31)
 - Scrolling time (1...5)
 - Select IND1 and IND 2 control: arrow scrolling / indicators
 - IND1 indicator symbol
 - IND2 indicator symbol
 - Floor marks

Size and environment

- Physical dimensions:
 - S2DM30x, 70 mm x 54 mm x 25 mm
 - 2DM30xx, 110 mm x 65 mm x 25 mm
 - 3DM30xx, 110 mm x 65 mm x 25 mm
 - 2DM50xx, 110 mm x 65 mm x 25 mm
 - 2DM50xx, 154 mm x 65 mm x 25 mm
- Tolerances: ± 1 mm
- Operation environment:
 - Temperature: 0...60 °C
 - Dry environment, RH: <85% (no condensation)
 - Not to be used in wet, moist or dusty environment

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PRODUCT SPECIFICATION
 3DM30
 Dotmatrix Display Device for Lifts

