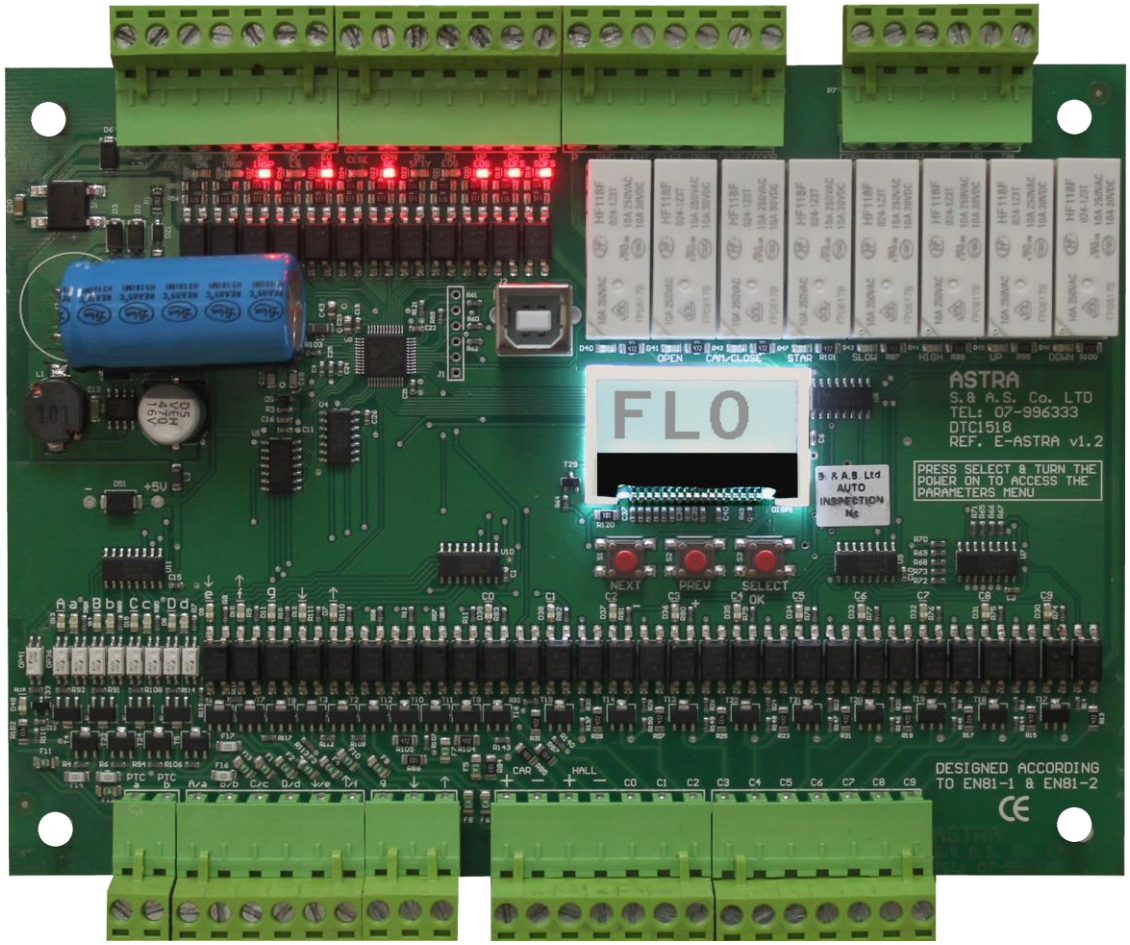
S. & A.S. LTD

ELEVATOR CONTROL MODULE

COLLECTIVE DOWN – 10 STOPS
COLLECTIVE FULL – 6 STOPS
REF. ASTRA V1.2



USER'S MANUAL

FOR S/W VERSION BA120100
1614

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1. GENERAL DESCRIPTION

1.1 MAIN FEATURES

Platform	Microcontroller
Type	AC 1 speed – AC 2 speed – Hydraulic[1] - VVVF
Self diagnostic	Error codes describing common faults related to periphery inputs
On-board display	A 3-Digit LCD numeric display is used for floor, error messages and menu
Push buttons	Three push buttons used to access different parameter and the menu
Error count	Count of fatal errors is displayed
Shaft information	End of shaft in the up direction End of shaft in the down direction Slow down and final stop in the up direction Slow down and final stop in the down direction Car position is saved following a power failure[2]
Indicator signal	Gray Code or Binary Code or Enhanced Code (when using S.&A.S. scrolling display) or 7-Segment code
Number of stops	10 stops collective down – 6 stops collective selective (when using Gray code or Binary code or Enhanced code or 7-segment) 9 stops collective down only when using 7-segment negative
Door type	Swinging or automatic door[3] or half automatic door[12]
Door controls[4]	Input for re-open, photocell and door jam switch + input to bypass closing delay[5]
Door status[6]	Parking with door opened or door closed[7]
Floor Stop time	Variable from 0 to 9.9 seconds[8]
Car light	Automatic switch off after delay - 0 to 9.9 seconds[9]
Inspection mode	For installation and maintenance purposes using slow speed[10] (bypasses all shaft information)
PTC Input	Motor PTC input halts lift operation when motor overheats
Outputs	Indicator and Call outputs are short circuit protected
Terminals	All terminals are individually labeled according to function to facilitate identification

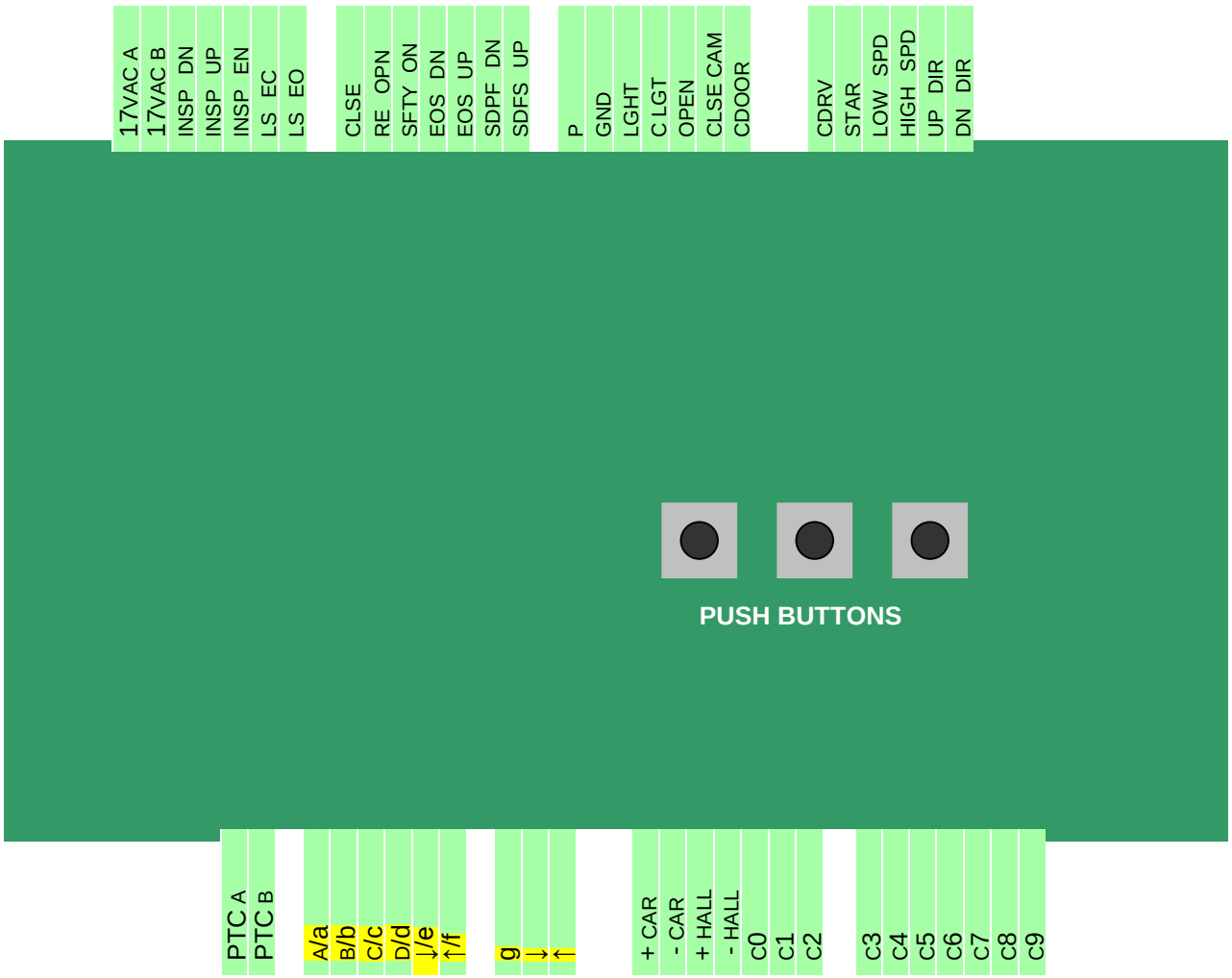
1.2 TECHNICAL DATA

Supply voltages	Board supply: 17vac +15% -25% - 120mA Periphery supply: 22vdc +15% -25%
Inputs	Each input has a led to indicate its status – all inputs are optically isolated Input active voltage level is 22vdc
Control outputs	Each output has a led to indicate its status – all outputs are dry relay contacts Rated at 250Vac 10A[11]
Call terminals	Each call has a led to indicate its status Call are optically isolated Call active voltage level is zero volts (GND) Call terminals are capable of driving 15mA leds on 22vdc The + and – supplies of Car and Hall are short circuit protected
Indicator outputs	Each output has a led to indicate its status – all outputs are optically isolated For A,B,C,D: Red LED On = Output voltage level is 22vdc (P) For a, b, c, d, e, f, g: Green LED On = Output voltage level is 0vdc (GND) For arrow up and arrow down: Green LED On = Output voltage level is 0vdc (GND)
Connection	Screw type, plug-in connectors

[1] Selection by DIP switch, refer to section 3.1.
[2] When power returns, elevator resumes from where it was without the need of a homing trip.
[3] Selection by DIP switch, refer to section 3.1.
[4] For automatic door only.
[5] Activated by a push button in the car.
[6] For automatic door only.
[7] Selection by presetting parameters in the auxiliary functions menu, refer to section 3.3.
[8] Selection by presetting parameters in the auxiliary functions menu, refer to section 3.3.
[9] Selection by presetting parameters in the auxiliary functions menu, refer to section 3.3.
[10] Activated by an external key switch and two push buttons.
[11] Care should be taken to add a freewheeling diode in parallel with the coil of each DC contactor or DC relay driven from the board.
[12] Selected as Automatic by DIP switch & spare output function set as CAM.

2. TERMINAL DESCRIPTION

2.1 TERMINAL LAYOUT`



2.2 INPUT TERMINALS

SDFS_UP	Slow down and final stop in the up direction
SDPF_DN	Slow down and final stop in the down direction / DZ for automatic door when enabled in the menu
EOS_UP	End of shaft in the up direction
EOS_DN	End of shaft in the down direction
SFTY ON	Should be active when lift is moving
RE_OPN	Re-open for automatic door (when inactive) / door closed for swinging door (when active)
CLSE	Bypasses reclosing delay in automatic door / Emergency stop for swinging door when enabled in the menu
LS_EO	Limit switch end of opening
LS_EC	Limit switch end of closing
INSP_EN	Inspection enable (when input is inactive)
INSP_UP	Inspection up
INSP_DN	Inspection down
17VAC A	Board power supply – 17vac a
17VAC B	Board power supply – 17vac b
PTC A	Input from the PTC
PTC B	Input from the PTC

2.3 OUTPUT TERMINALS

2.3.1 OUTPUT TERMINALS FOR AC1 SPEED, AC2 SPEED AND VVVF

P +22V	Biasing voltage from periphery supply – positive side[1]
GND	Biasing voltage from periphery supply – negative side[1]
LGHT	Car light relay
CLGT	Common for LGHT output
OPN	Open door relay or contactor[2]
CLSE_CAM	Cam contactor[3] / Close relay or contactor[2]
CDOOR	Common for CLSE_CAM and OPN outputs
CDRV	Common for DN_DIR, UP_DIR, HI_SPD, LOW_SPD and STAR outputs
STAR	Spare output – refer to the menu in section 3.3
LOW_SPD	Low speed contactor or speed reference 1 in VVVF
HI_SPD	High speed contactor or speed reference 2 in VVVF
UP_DIR	For Hydraulic elevator with StP less than 0:Hydraulic Up Valve[4] Else Up direction contactor or forward in VVVF
DN_DIR	Down direction contactor or reverse in VVVF

2.3.2 OUTPUT TERMINALS FOR HYDRAULIC

P +22V	Biasing voltage from periphery supply – positive side[1]
GND	Biasing voltage from periphery supply – negative side[1]
LGHT	Car light relay
CLGT	Common for LGHT output
OPN	Open door relay or contactor[2]
CLSE_CAM	Cam contactor[3] / Close relay or contactor[2]
CDOOR	Common for CLSE_CAM and OPN outputs
CDRV	Common for DN_DIR, UP_DIR, HI_SPD, LOW_SPD and STAR outputs
STAR	Star output
LOW_SPD	Releveling relay
HI_SPD	High speed valve
UP_DIR	Pump delta contactor
DN_DIR	Down direction valve

2.3.3 INDICATOR OUTPUT TERMINALS

A/a	Floor information A[4] / a output[5]
B/b	Floor information B[4]/ b output[5]
C/c	Floor information C[4] / c output[5]
D/d	For Hydraulic elevator with StP greater than 0:Hydraulic Up Valve[4] Else For Hydraulic elevator with StP less than 0: Up direction contactor [4] Else Floor information D[4] / d output[5]
↓/e	Down Arrow[4] / e output[5]
↑/f	Up Arrow[4] / f output[5]
g	g output[5]
↓	Down Arrow[5]
↑	Up Arrow[5]

[1] Although this is not an output, it is listed with the outputs for convenience.
[2] For automatic door only.
[3] For swinging door.
[4] For Gray or Binary or Enhanced code indicator. Ind = grA, gr1, bin or Enh.
[5] For Seven segment code indicator. Ind = 7Sd or 7S-.

2.4 CALL TERMINALS

c9	Floor 9 call / minus output[1]
c8	Floor 8 call
c7	Floor 7 call
c6	Floor 6 call
c5	Floor 5 call
c4	Floor 4 call
c3	Floor 3 call
c2	Floor 2 call
c1	Floor 1 call
c0	Floor 0 call

3. PUSH BUTTONS

3.2 ON-BOARD DISPLAY AND PUSH BUTTONS FUNCTION DESCRIPTION

Three push buttons are used to simplify the access of the main menu. The first page in the menu displays the status of the elevator. The following three pages are used to access the historical of faults. The last page is used to initiate a homing trip. The **NEXT** and **PREV** buttons are respectively used to scroll downwards and upwards in the five pages menu. **SELECT** is used to access the function or information within the menu item. No functions are associated with the first item in the menu (i.e. Page 1). The following table describes the Main Menu along with all its functions:

Page	Display	Description
1[1] (default)	**FL#**	Normal operation with floor displayed on the right. The floor is replaced by a downward scrolling minus sign "**-**" when elevator is making a homing trip.
	IN#	Inspection mode with floor displayed on the right. The floor is replaced by a downward scrolling minus sign "**-**" when elevator is making a homing trip.
	E##	Error detected with error code displayed on the two digits on the right.
2	**ERR**	**SELECT** displays the most recent error in memory. The error code is displayed on two leftmost digits and the floor on which the error occurred is displayed on the rightmost digit. The error code and the floor are separated by a decimal point. **NOE** is displayed if there are no errors in memory. **PREV** displays the previous error in memory. If no previous errors exist, the display returns to Err. **NEXT** displays the errors in memory in the opposite direction of **PREV**.
3	**FER**	**SELECT** displays the count of level II errors in memory[2]. **NOF** is displayed if there are no level II errors.
4	**ERA**	**SELECT** clears all errors from memory. **DON** is displayed to indicate the completion of this task.
5	**HTR**	**SELECT** initiates a homing trip

[3]

3.2.1 ON-BOARD CALL REGISTRATION FUNCTION

The operator can give calls using the push buttons to test the lift. The display has to be on Page 1. Lift has to be in normal operation with no faults. The display shows FL#. Press SELECT, the display will show Fr# with # blinking. Use the PREV and NEXT push buttons to change the floor selection. Once the desired floor is displayed, press SELECT push button. The call for this floor is registered and the appropriate led will light on the board as well as in the car. The lift will proceed to serve this call. If no buttons are pressed in 5 seconds, the # will stop blinking and will show the floor information. To exit the call registration mode, press the SELECT push button for 3 seconds. The board will also exit the call registration mode if no buttons are pressed for 1 minute.

3.2.2 ON-BOARD INSPECTION OPERATION

When in inspection mode, NEXT and PREV push button act as INSP_DN and INSP_UP inputs respectively. The INSP_DN and INSP_UP inputs have higher priority and will override the NEXT and PREV push buttons.

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[1] If any other page is selected, page 1 is automatically restored if no push buttons are pushed for 10 seconds.
[2] Refer to sections 4.1 and 4.3.
[3] For Seven segment code indicator with negative sign. Ind = 7S-.
[2] If any other page is selected, page 1 is automatically restored if no push buttons are pushed for 10 seconds.
[3] Refer to sections 4.1 and 4.3.

3.3 AUXILIARY FUNCTIONS MENU

To access the auxiliary functions menu:

1. Press **SELECT** push button.
2. Turn Power On.
3. Using **NEXT** and **PREV** push buttons go to the menu item you desire to edit or change.
4. Press **SELECT** to edit the parameter associated with the menu item.
5. Use **INC** and **DEC** push buttons to make the desired change.
6. Press **OK** to enter the new value in memory.
7. To modify another parameter repeat from step 4.
8. To end parameter editing, go to **EXT** and select **OK** (elevator will become active again).

Display	Description	Range
PAR	Selects the parking mode for automatic door: **OPN** = Parking door opened **CLD** = Parking door closed	OPN – CLD
DOR	Selects the type of the elevator door: **SWG** = Swinging door **AUT** = Automatic door	SWG – AUT
DRV	Selects the drive type: **AC2** = AC2 Speed **HYD** = Hydraulic	AC2 – HYD
LGT	Sets the car light time	0 - 25.0 sec
FLT	Sets the floor stopping time	0 - 25.0 sec
LDF	Sets the landing floor	NON, 0 – 9
LDT	Sets the landing time	1 – 99 min
CJD	Sets the car jammed delay	DIS,1 to 255sec
ADO	The automatic door is considered jammed after this delay	DIS,1 to 255sec
SPR	In case Hydraulic is not selected, sets the **STR** output function: gong, intermediate speed[1] (used in VVVF operation) or base block (used in VVVF operation)	GNG,INT,BBL
DZO	When enabled, SDFS DN input is re-assigned as DZ for automatic door only. DZ should be active on every floor stop to allow door opening	DIS – ENA
EDI	When enabled, CLSE input is re-assigned as emergency stop for swinging door only	DIS – ENA
STR	Sets the start time in hydraulic mode. If hydraulic is not selected, it selects VVVF and sets the start delay: Zero: AC2-speed is selected (STP has to be set to zero as well) Positive value: VVVF selected with direction engaging before speed reference Negative value: VVVF selected with speed reference engaging before direction	-9.9 to 9.9 sec
STP	Selects VVVF and sets the Stop delay: Zero: AC2-speed is selected (STR has to be set to zero as well) Positive value: VVVF selected with speed reference disengaging before direction Negative value: VVVF selected with direction disengaging before speed reference	-9.9 to 9.9 sec
RLL	Sets the re-leveling option in hydraulic mode	ALL – SEL
EOS	Enables the EOS during the inspection	DIS – ENA
POH	Enables Power-on homing	DIS – ENA
Ind	**grA** = Gray code floor information output **gr1** = Gray code floor information output starting from 1 **bin** = Binary code floor information output **EnH** = Enhanced scrolling display information output **7Sd** = Seven Segment display information output: - Maximum number of basements is 1 - Maximum number of stops is 10 (C0,C1,C2....C9). **7S-** = Seven Segment display information output with dedicated minus character - Maximum number of basements is 8 - Maximum number of stops is 9 (C0,C1,C2....C8). - Collective type mode is down only. - C9 is used for the "-" sign of the indicator for the basements. **7S1** = Seven Segment display information output starting from 1: - No basements - Maximum number of stops is 9 in down collective mode (C0,C1,C2....C8). - Maximum number of stops is 6 in full collective mode.	grA gr1 bin Enh 7Sd 7S- 7S1

[1] When the intermediate speed is selected, the SPR is engaged when the destination is just one floor away. Note that once lift has initiated travel to a destination further that the next floor (SPR not engaged), calls received from the next floor will not be served in the current trip.

Display	Description	Range
BAS	Sets the number of basement (affects the direction of the hall calls)	0-9
PCL	Enables permanent close for automatic door	DIS – ENA
COL	Selects between collective selective and down collective modes	FuL – Dn
PTC	Enables continuously monitoring of the motor PTC	DIS – ENA
COD	Press push button to access **CODE MENU**[1]	
EXT	Exits the menu	

3.3.1 CODE MENU

A blank screen appears with a minus sign "**-**" on the three digits. Use the **INC** and **DEC** push buttons to set the first digit of the code. Use **OK** to enter it. The digit is instantaneously replaced by "**C**". A minus sign "**-**" on the second digit prompts you to enter the second digit of the code by repeating the above procedure. Repeat this process until all six digits are entered. If you make a mistake in any digit, follow through till the end and then repeat from the beginning. If the code is correct, you will be able to access the following menu:

Display	Description	Range
STA	Selects the status of the code lock feature	DIS – ENA
ELA	Displays the count of the number of days elapsed Pressing **INC** or **DEC** push buttons resets counter to zero	N/A
DAY	Displays the preset number of operating days	0 to 999
OUT	Press **SELECT** push button to exit code menu	N/A

4. VIEWING ERRORS AND ERROR CODE DESCRIPTION

4.1 HOW TO VIEW THE ERRORS

Faults detected by the board are divided into three kinds:

1. Level I faults: faults that block the elevator when they occur. But the elevator can resume operation right after the fault disappears.
2. Level II faults: faults that can be tolerated for a few occurrences before the elevator is blocked by the board. The count of level II faults can be accessed in page 3 of the main menu. When the count of level II faults reaches 10, the board will block the elevator.
3. Level III faults: faults that the board considers to be fatal and will consequently block any further operation of the elevator.

The last 10 errors can be viewed on page 2 of the main menu[2].

4.2 HOW TO CLEAR THE ERRORS

To clear the errors as well as the count of level II faults from memory, go to page 4 of the main menu and press the **SELECT** button. Refer to section 3.2.

4.3 ERROR CODE DESCRIPTION

Error	Level	Description	Action taken
20[3]	I	Safety circuit and/or door opened during travel	Waits for safety circuit to close
21[2]	I	Door lock circuit opened during travel	Waits for lock circuit to close, cancels calls if fault persists more than 5sec[3]
21[4]	I	Safety circuit failed to close after door closing	Cancels calls and opens door[3]
22[2]	I	Failure in locking door after 3 attempts	Cancels calls[3]
22[4]	II	Failure in closing door	Cancels calls, opens door[3]
23[4]	II	Failure in opening door	Close door and resume
24, 25	N/A[7]	Whenever EOS info does not correspond to the floor, a homing trip is done with no fault registered	N/A
26	II	Shaft information fault	Performs a homing trip
28	III	EOS-UP and EOS-DN faults (both open)	Blocks elevator[6]
29	III	Motor has been powered for "CJd" time, car did not move	Blocks elevator[5]

[1] Refer to section 3.3.1 for details on accessing **CODE MENU.**
[2] Refer to section 3.2.
[3] For swinging door.
[3] Waits for a call to resume operation.
[4] For automatic door.
[5] After repairing the faulty part, erase the faults. Refer to section 3.2.
[6] When the cause of the fault is diagnosed and fixed, the elevator will automatically resume operation.
[7] N/A means not assigned.

34	I	Motor has overheated (indicated by the PTC input), lift stops at nearest floor	Waits until motor cools down
35	III	Preset number of operating days expired	Blocks elevator[1]

5. FIRMWARE UPGRADE

5.1 INSTALLING THE ASTRA FIRMWARE UPGRADE SOFTWARE

In order to upgrade firmware on site, a CD will be provided by S.&A.S.Ltd & the below steps shall be followed:

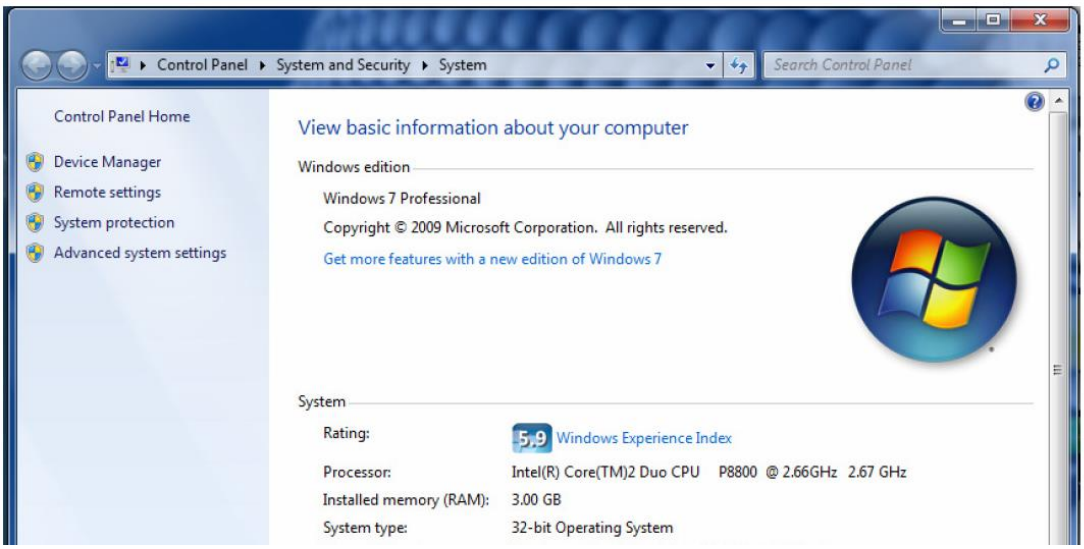
1. Run file “SAS_Patch.exe” located in “Astra_PTool\SAS_PTool” folder.
2. Setup the application located in “Astra_PTool\SAS_PTool \SAS_PTool_Setup” folder
3. SAS_PTool will appear in the programs list. Send it to Desktop as shortcut.

5.2 INSTALLING THE ASTRA USB DRIVER

1. Plug in the USB cable to the Astra device before turning power on
2. Turn on power of the Astra device. All the leds on the front starts blinking.

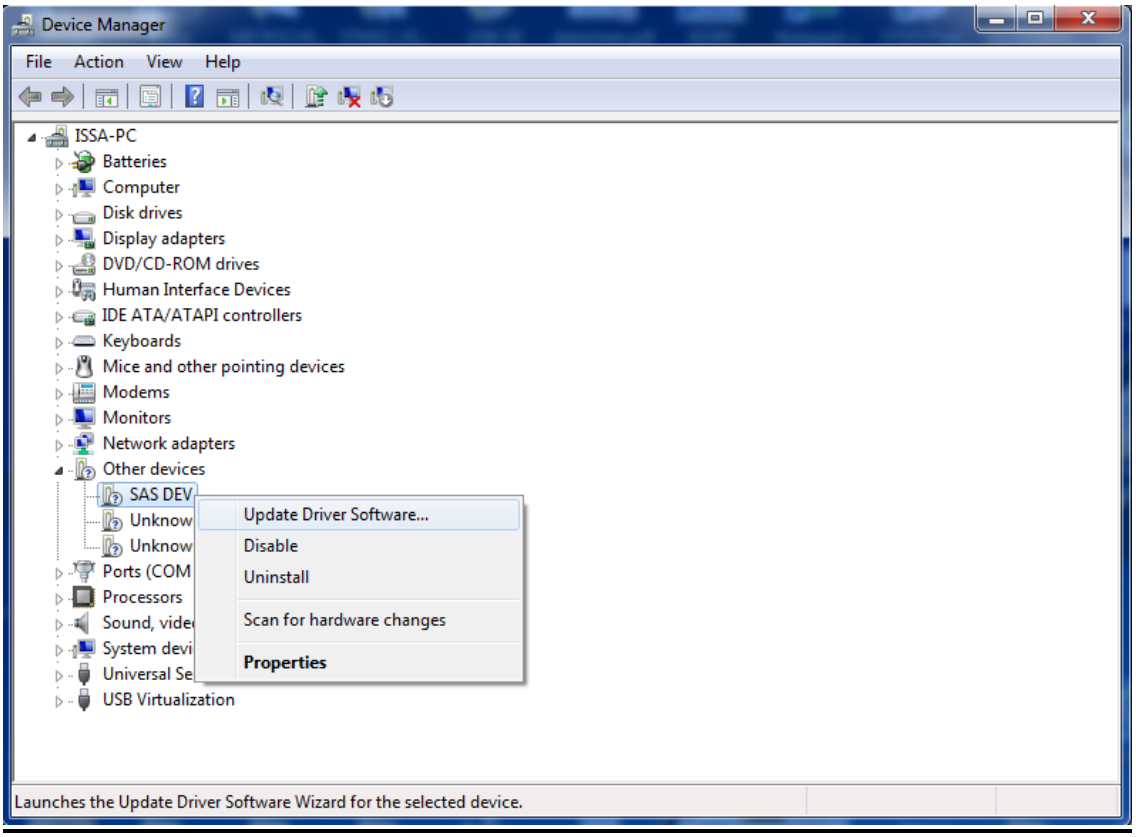
5.2.1 DRIVER SETUP FOR WINDOWS VISTA/WIN7[2]

The first Astra plugged into the PC USB port may not launch an automatic start. In this case, right-click my computer and choose properties. The following window appears. On the left side of the window, click on Device Manager.

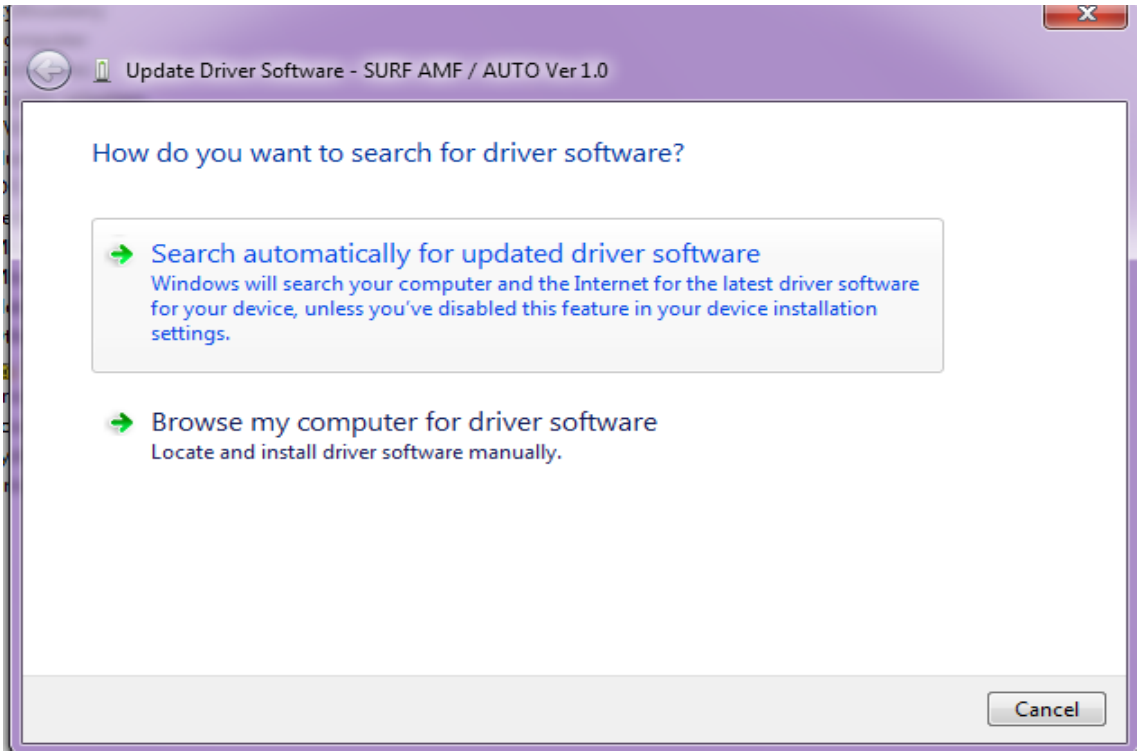


The “SAS DEV” device will appear in Other Devices, right-click it and choose Update Driver Software.

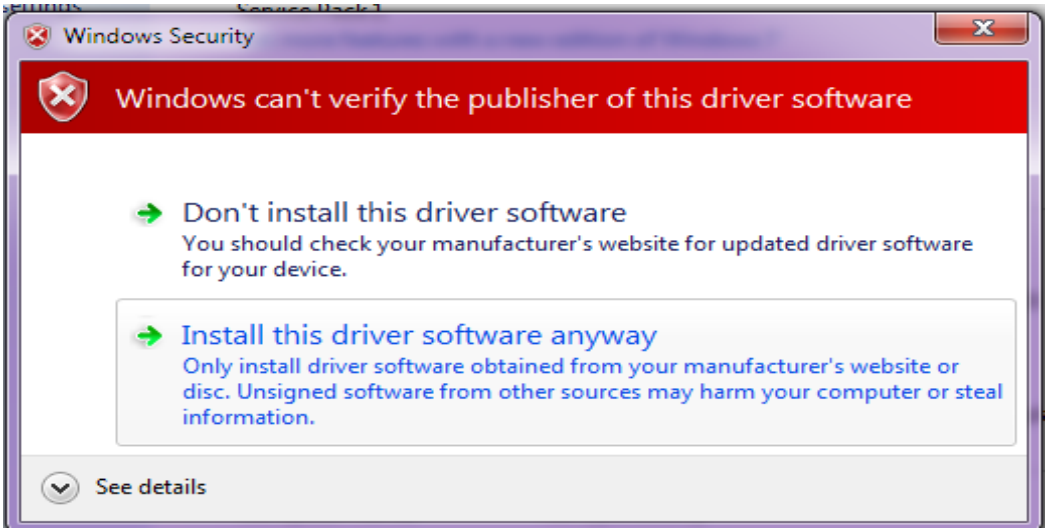
[1] To recover from error 35, access code menu and clear the count of elapsed days. Refer to sections 3.3 and 3.3.1.
[2] This will be implemented only one time when the first Surf is connected to PC through USB.



Select “Search automatically for updates driver software”.



Select install this driver software anyway.



The Driver SETUP procedure will be done only once For Windows vista/Win7.
So, the driver of any new ASTRA connected to the PC USB port will be installed automatically.

5.2.2 DRIVER SETUP FOR WINDOWS XP

Each time new ASTRA is plugged into the PC USB port, a “Found New Hardware Wizard” window appears.
Select “Install the software automatically (Recommended)” and click next.

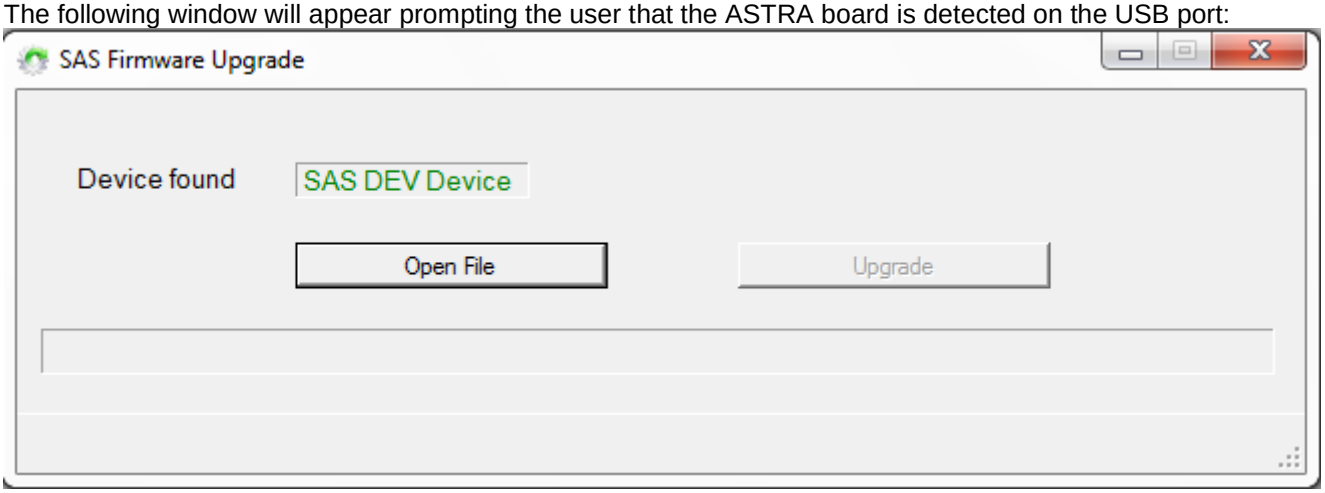
Select “Continue Anyway”.

The driver of the new ASTRA connected to the PC USB port will be installed automatically.

5.3 FIRMWARE UPGRADE PROCESS

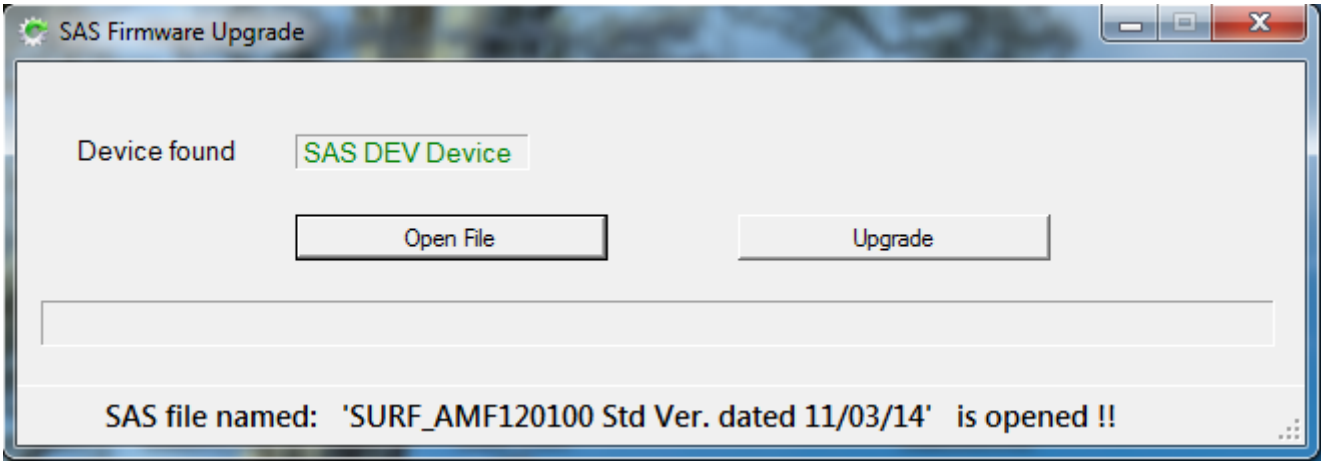
Run “SAS_PTool” application.

The following window will appear prompting the user that the ASTRA board is detected on the USB port:

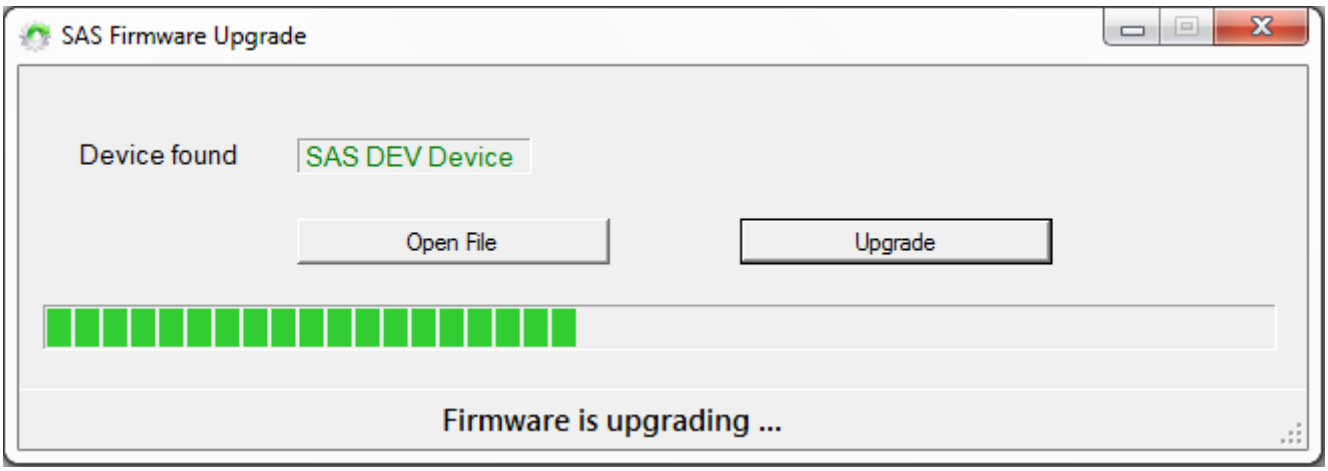


Click Open to choose the *.sas file that will be used to upgrade the firmware.

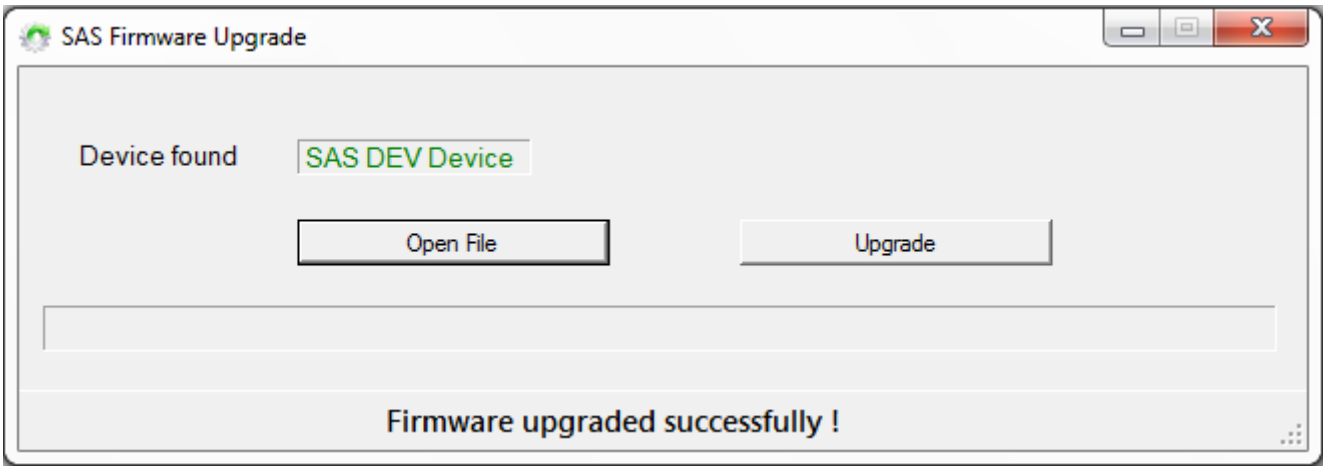
A Footnote will appear showing the file name, the software version and its date:



Click upgrade. The upgrade progress is shown as below:



Once the upgrade is complete, the footnote “Firmware upgraded successfully” will appear:



Then the ASTRA Firmware upgraded successfully and the ASTRA will automatically run the new firmware.

6. GOOGLE STORE FIRMWARE UPGRADE

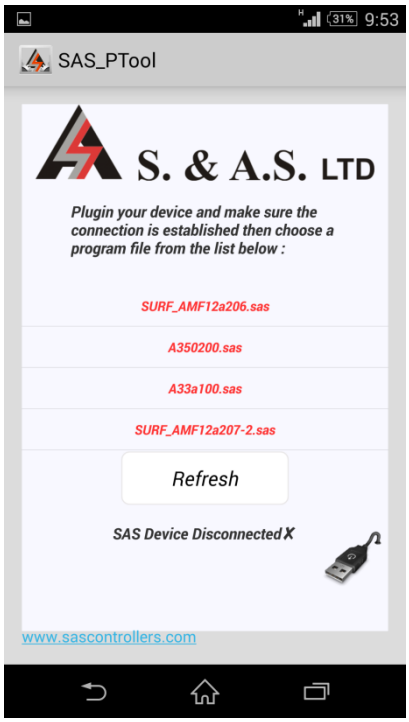
6.1 INSTALLING THE SASPTOOL FIRMWARE APPLICATION ON THE MOBILE

In order to upgrade firmware from a mobile, follow the below steps:

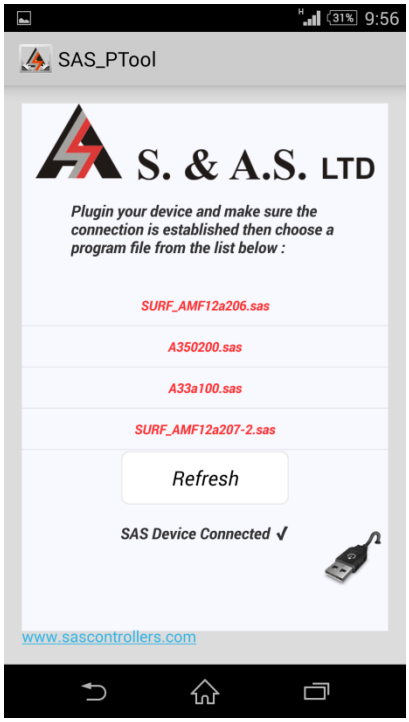
1. Search for the application “SASPTool” on google store and install it, or follow the link below: https://play.google.com/store/search?q=SASPTool.

6.2 FIRMWARE UPGRADE PROCESS

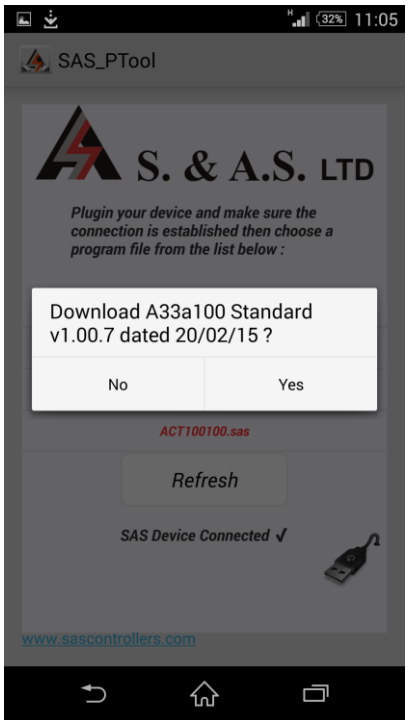
Run “SAS_PTool” application from the mobile.
The below window appears showing all *.sas files already saved.



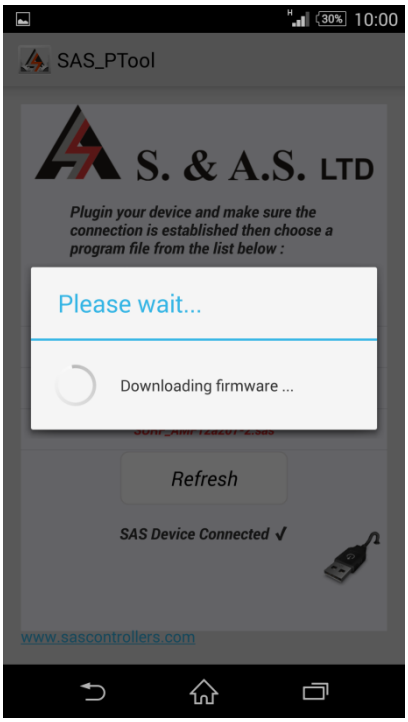
Power off the Astra board.
Use a USB cable to connect board to the mobile.
Turn Astra on.
The following window will appear showing that a SAS Device is now connected:



Click on the sas file that you need to download.
A Popup window will appear showing the file name, its description and its date:



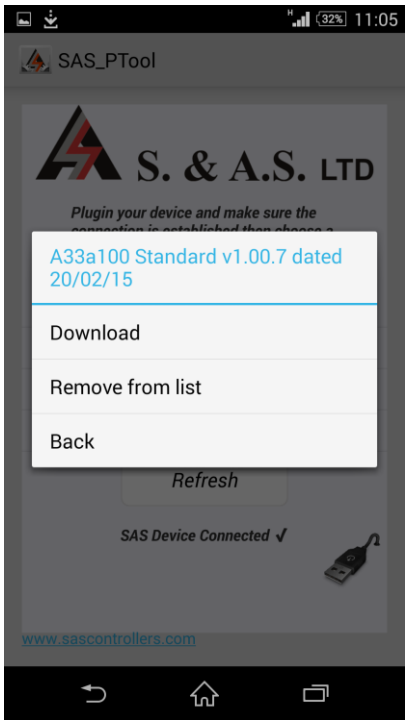
Click Yes. The downloading starts:



Once the downloading is complete, the message “Firmware Downloaded successfully” will appear:

Disconnect the USB cable.
The user can now process with normal operation of the lift.

If you desire to delete any sas file from the mobile list, press on the filename until a Popup window appears showing you multiple choices:



6. APPENDIX A

This appendix contains all wiring diagrams relevant to assembling the board in a panel.

BA110V1W1
BA110V1W1.Sch

BA110V1W2
BA110V1W2.Sch

BA110V1W1_AC
BA110V1W1_AC.Sch

BA110V1W2_AC
BA110V1W2_AC.Sch

BA110V1W3
BA110V1W3.Sch

BA110V1W4
BA110V1W4.Sch

BA110V1W5
BA110V1W5.Sch

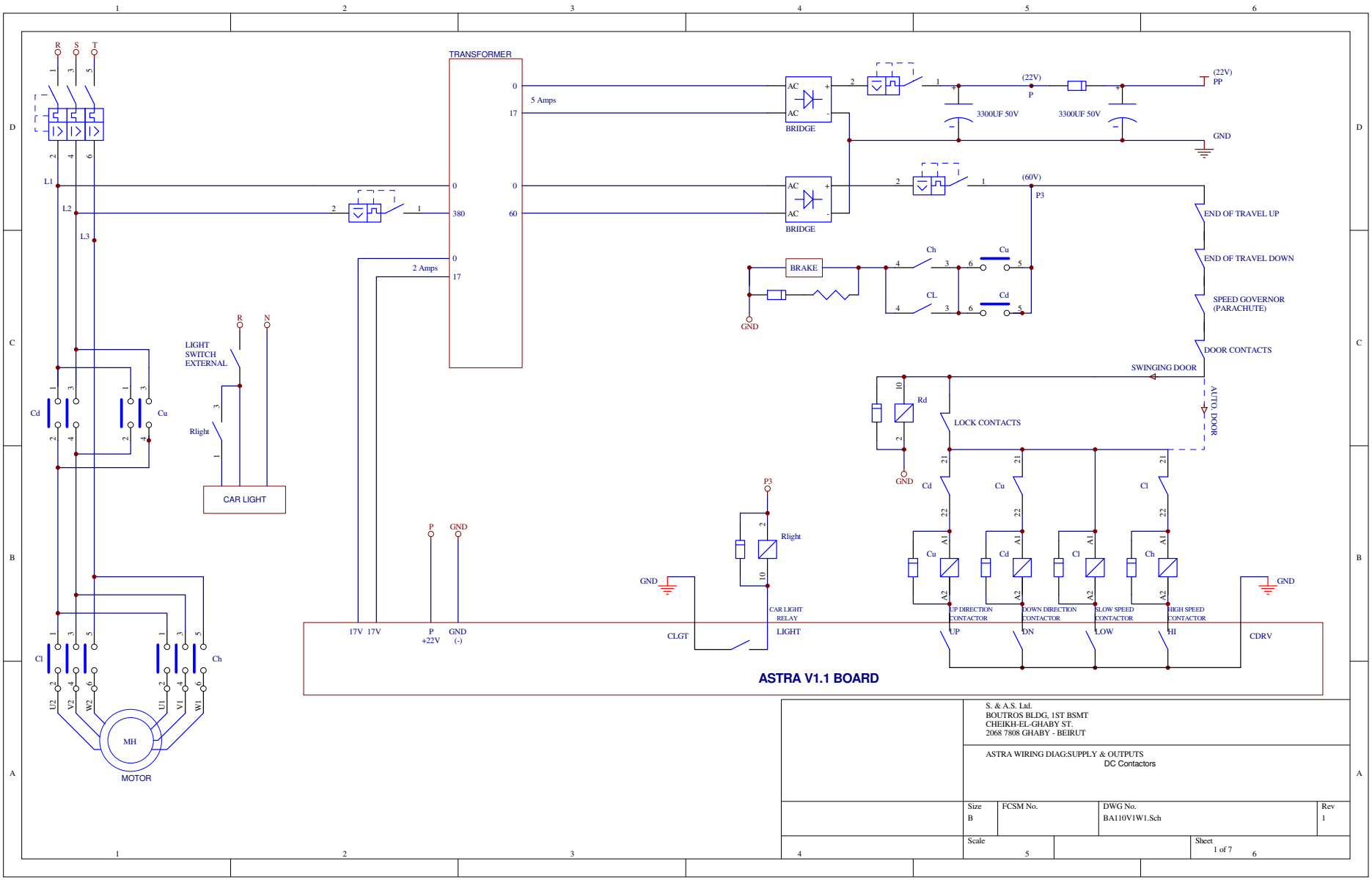
ASTRA AC2SPEED WIRINGS

S. & A.S. Ltd.
BOUTROS BLDG, 1ST BSMT
CHEIKH-EL-GHABY ST.
2068 7808 GHABY - BEIRUT

ASTRA AC2SPEED WIRING DIAG

Size	FCSM No.	DWG No.	Rev
B		BA110V1-WirDiag.Sch	1

Scale	Sheet
	1 of 1

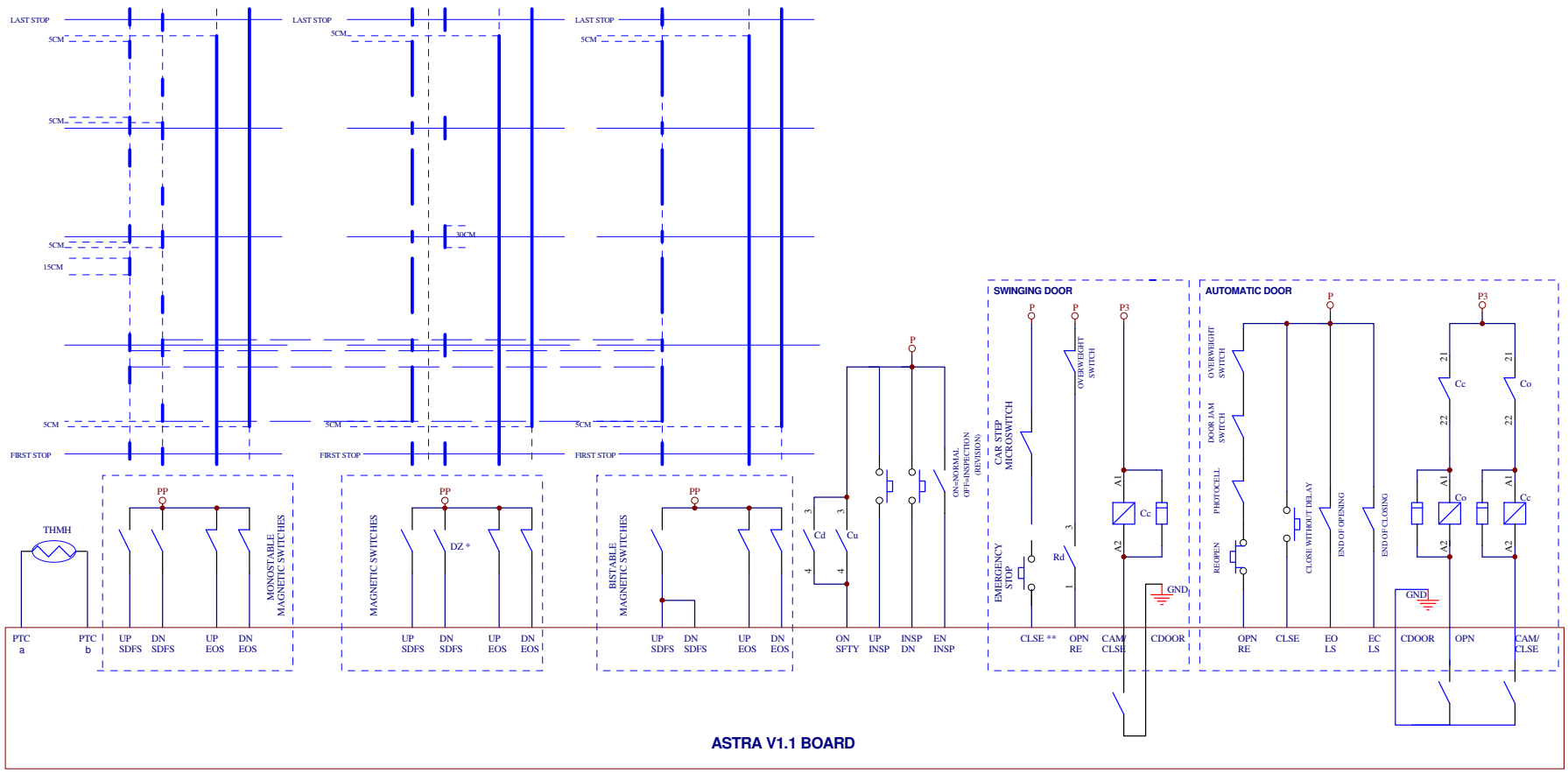


S. & A.S. Ltd.
BOUTROS BLDG, 1ST BSMT
CHEIKH-EL-GHABY ST.
2068 7808 GHABY - BEIRUT

ASTRA WIRING DIAG:SUPPLY & OUTPUTS
DC Contactors

Size	FCSM No.	DWG No.	Rev
B		BA110V1W1.Sch	1

Scale	Sheet
	1 of 7



Note:
1- Use the Monostable Magnetic Switches configuration for Automatic door.

(*) If DZ enabled in automatic door
(**) If emergency stop enabled in swinging door

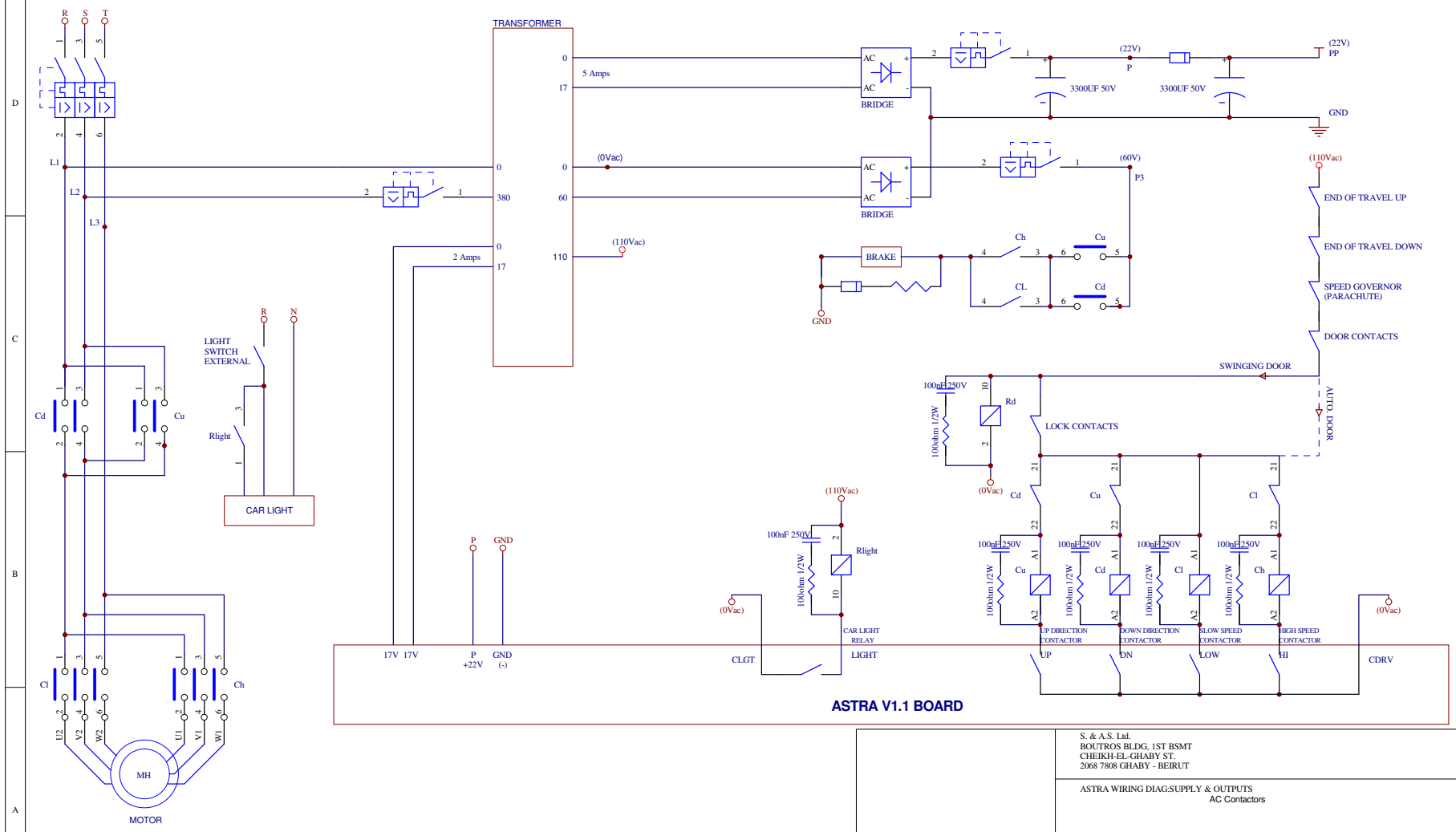
S. & A.S. Ltd.
BOUTROS BLDG, 1ST BSMT
CHEIKH-EL-GHABY ST.
2068 7808 GHABY - BEIRUT

ASTRA WIRING DIAG: INPUTS / DOOR INFO
DC Contactors

Size	FCSM No.	DWG No.	Rev
B		BA110V1W2.Sch	1

Scale

Sheet 2 of 7

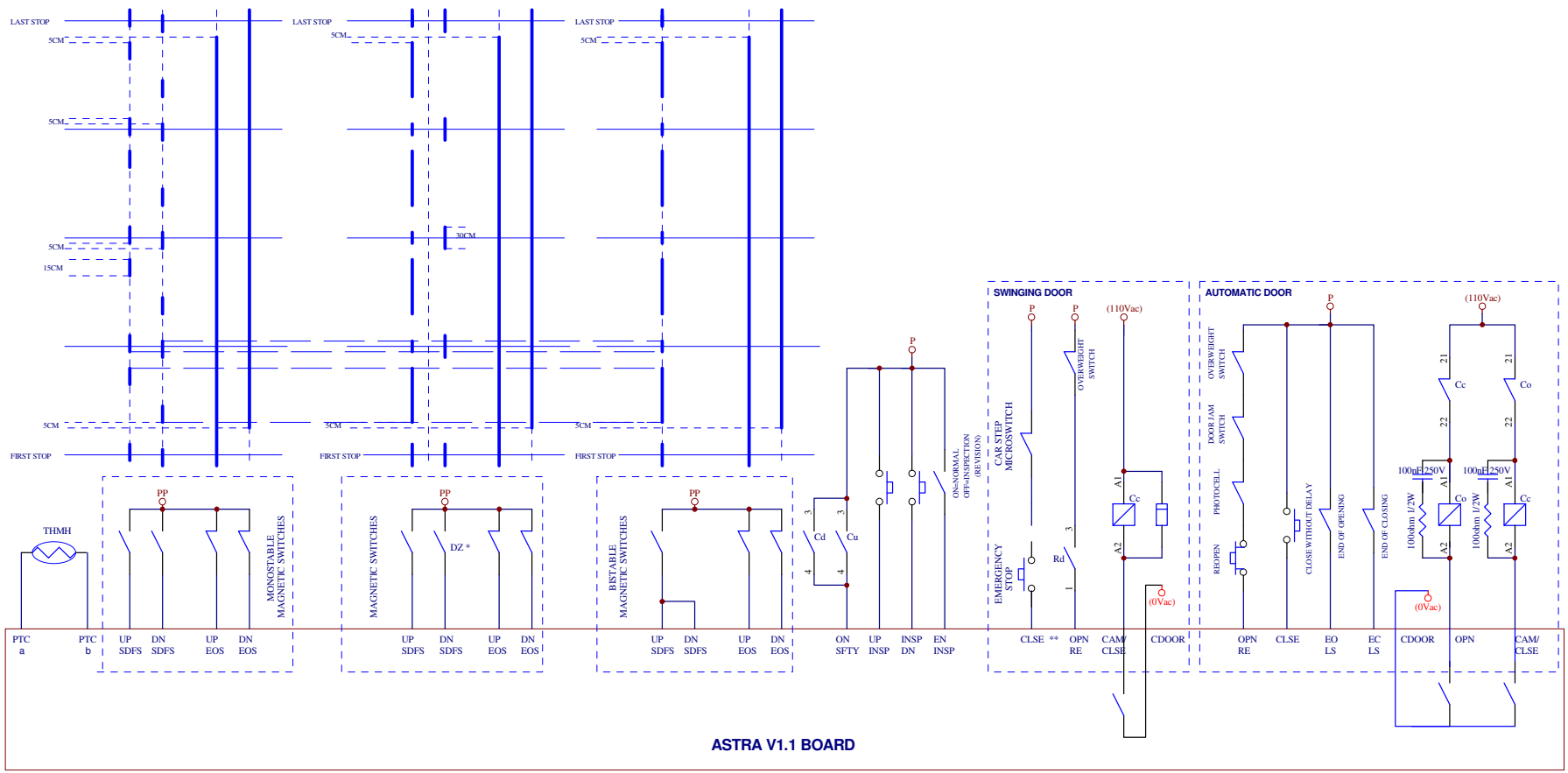


S. & A.S. Ltd.
BOUTROS BLDG, 1ST BSMT
CHEIKH-EL-GHABY ST.
2068 7808 GHABY - BEIRUT

ASTRA WIRING DIAG:SUPPLY & OUTPUTS
AC Contactors

Size	FCSM No.	DWG No.	Rev
B		BA110V1W1_AC.Sch	1

Scale	Sheet
	3 of 7



ASTRA V1.1 BOARD

Note:
1- Use the Monostable Magnetic Switches configuration for Automatic door.

(*) If DZ enabled in automatic door
(**) If emergency stop enabled in swinging door

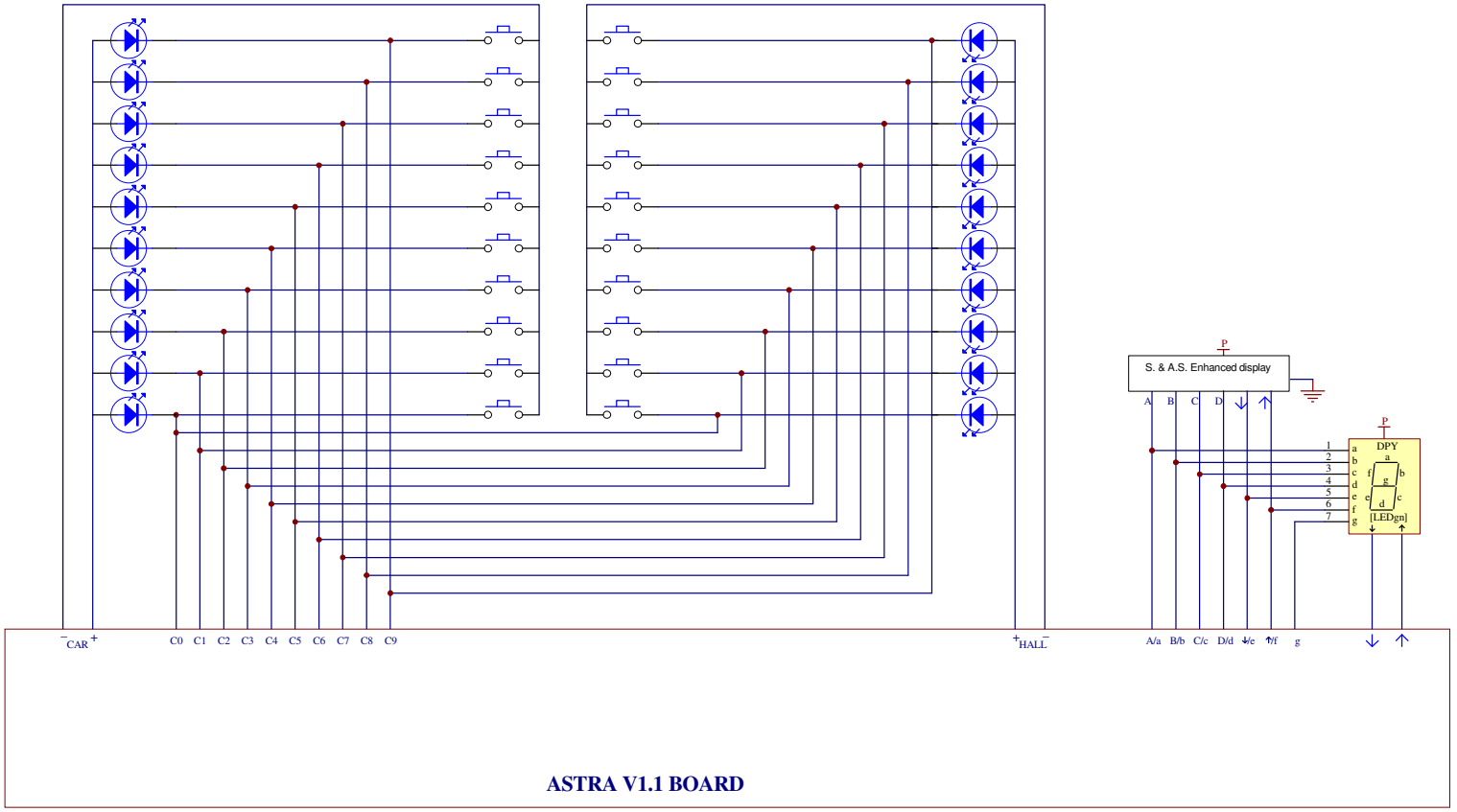
S. & A.S. Ltd.
BOUTROS BLDG, 1ST BSMT
CHEIKH-EL-GHABY ST.
2068 7808 GHABY - BEIRUT

ASTRA WIRING DIAG: INPUTS / DOOR INFO
AC Contactors

Size	FCSM No.	DWG No.	Rev
B		BA110V1W2_AC.Sch	1

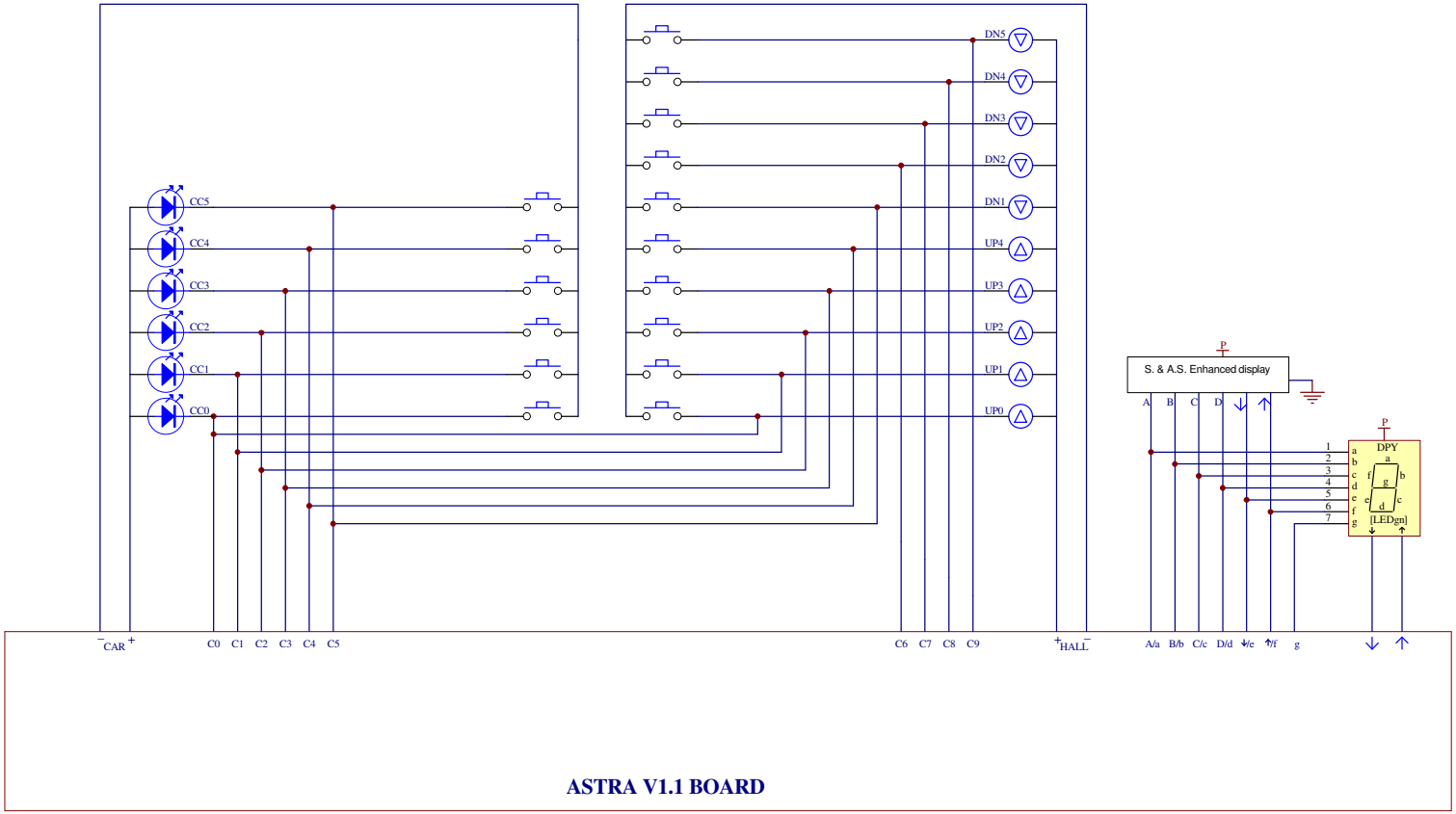
Scale

Sheet 4 of 7



ASTRA V1.1 BOARD

Ind="EnH" or "7Sd"	S. & A.S. Ltd. BOUTROS BLDG, 1ST BSMT CHEIKH-EL-GHABY ST. 2068 7808 GHABY - BEIRUT			
	ASTRA WIRING DIAG: CALLS / FLOOR INFORMATION - Down Collective - 10 stops			
	Size B	FCSM No.	DWG No. BA110V1W3.Sch	Rev 1
	Scale		Sheet 5 of 7	



ASTRA V1.1 BOARD

Ind="EnH" or "7Sd"

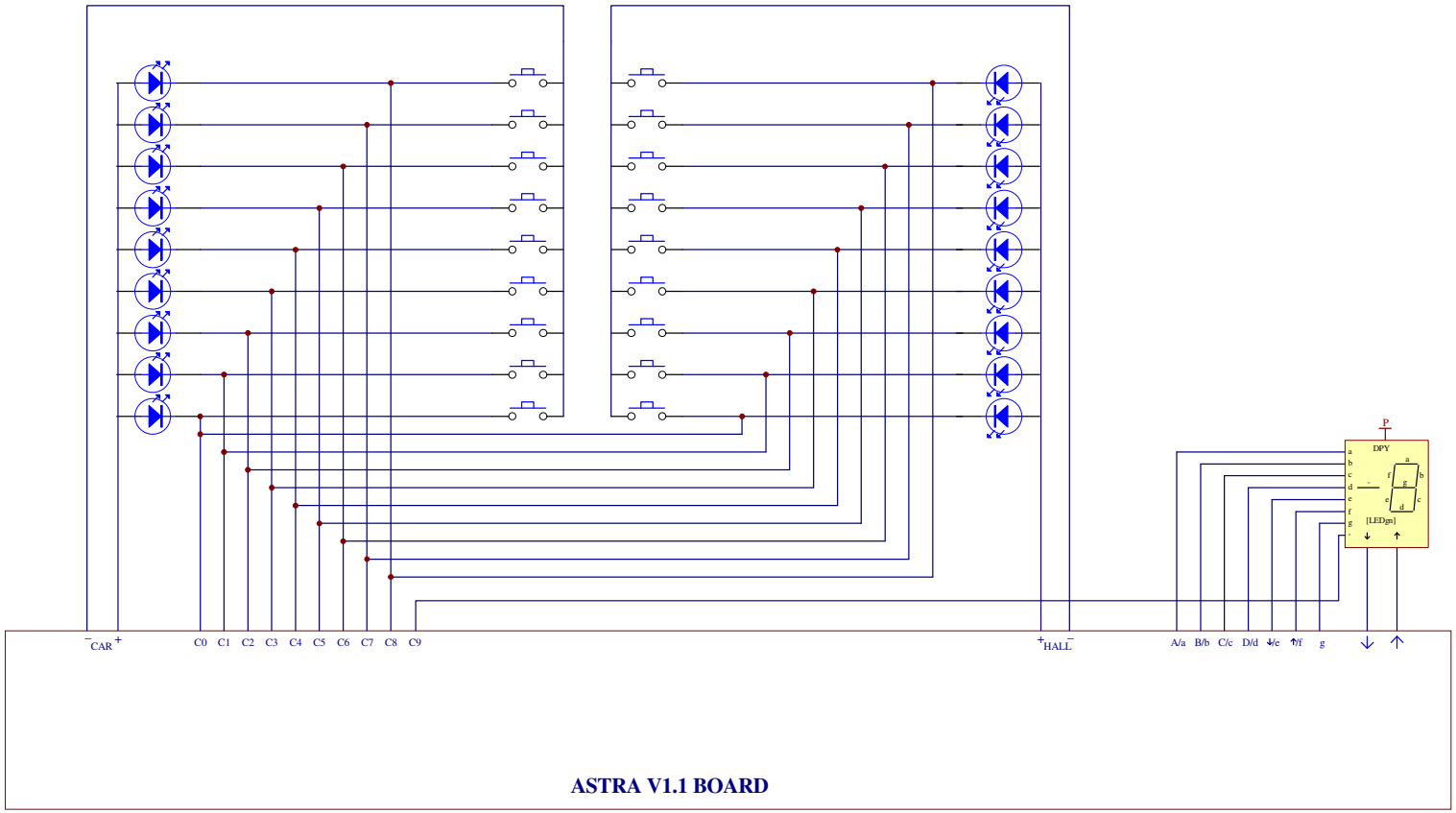
S. & A.S. Ltd.
BOUTROS BLDG, 1ST BSMT
CHEIKH-EL-GHABY ST.
2068 7808 GHABY - BEIRUT

ASTRA WIRING DIAG: CALLS / FLOOR INFORMATION - Full Collective - 6 stops

Size	FCSM No.	DWG No.	Rev
B		BA110V1W4.Sch	1

Scale

Sheet 6 of 7



ASTRA V1.1 BOARD

Ind="7S-"	S. & A.S. Ltd. BOUTROS BLDG, 1ST BSMT CHEIKH-EL-GHABY ST. 2068 7808 GHABY - BEIRUT			
	ASTRA WIRING DIAG: CALLS / FLOOR INFORMATION - Down Collective - 9 stops			
	Size B	FCSM No.	DWG No. BA110V1W5.Sch	Rev 1
	Scale		Sheet 7 of 7	