

CONTROL AND MODBUS COMMUNICATION

APPENDIX TO THE LS M100 MANUAL



THE FOLLOWING MANUAL ASSUMES GOOD KNOWLEDGE OF TECHNICAL DOCUMENTATION INCLUDED WITH THE AIR HANDLING UNIT (AHU). THIS MANUAL CONSIDERS ONLY THE CONTROL AND COMMUNICATION CIRCUITS. THE INSTALLATION OF THE FREQUENCY CONVERTER AND INSTALLATION OF MAINS AND MOTOR CABLES SHOULD BE DONE ACCORDING TO THE LG iCS MANUAL.

1. FOR ALL CONFIGURATIONS SET THE COMMON PARAMETER LIST

Parameter	Code	Value	Comment
All parameters visible.	Ogr	1	Without setting this parameter - only few basics parameters visible.
Acceleration time	ACC	45	Recommended 45 seconds.
Deceleration time	DEC	45	Recommended 45seconds.
Max. Frequency	FrM	100	
Base motor frequency	MbF	50	
U/f curve selection	bA-07	1	Square curve
Thermal motor protection	Pr-40	1	Protection on
Motor pole	bA-11	*	from 2 to 12
Motor slip	bA-12	**	Scale 0,1
Motor current	Mrc	**	Scale 0,1
Motor no load current	bA-14	**	Scale 0,1
Hz - RPM speed scalling	Ad-63	**	Scale 1
Digital input function Etb/	In-69	19	

2. CONFIGURATIONS WITHOUT VTS CONTROLS

2.1. Local control using integrated control panel

- Set additional parameters:

Parameter	Code	Value	Comment
All parameters visible.	Ogr	1	Without setting this parameter - only few basics parameters visible.
Command source	drv	0	Keypad buttons Run/Stop
Frequency reference source	Frq	2	Built in potentiometer
V2 output at minimum voltage (%)	In-39	20	
V2 output at maximum voltage (%)	In-41	100	

- Use the RUN and STOP/RST buttons to control the drive
- Use built-in potentiometer to set frequency

2.2. Remote control with three speeds

- Set additional parameters:

Parameter	Code	Value	Comment
All parameters visible.	Ogr	1	Without setting this parameter - only few basics parameters visible.
Command source	drv	1	Keypad buttons Run/Stop
Frequency reference source	Frq	4	Built in potentiometer
Step frequency 1	Ba-50	*	20-100
Step frequency 3	Ba-52	*	20-100
Step frequency 7	Ba-56	*	20-100
Digital input P2 function Speed - L	In-66	5	
Digital input P3 function - Speed - M	In-67	6	
Digital input P4 function - Speed - H	In-68	7	

- Wire the I/O terminal of the iCS inverter according to the **Figure 1**
- Use P1/P2/P3/P4 inputs to set desired drive function
0000 = STOP
1100 = START, 1ST SPEED
1110 = START, 2ND SPEED
1111 = START, 3RD SPEED

3. EXHAUST UNIT WITH VTS CONTROL SYSTEM

- Set additional parameters:

Parameter	Code	Value	Comment
All parameters visible.	Ogr	1	Without setting this parameter - only few basics parameters visible.
Command source	drv	1	Keypad buttons Run/Stop
Frequency reference source	Frq	4	Built in potentiometer
Step frequency 1	Ba-50	*	20-100
Step frequency 3	Ba-52	*	20-100
Step frequency 7	Ba-56	*	20-100
Digital input P2 function Speed - L	In-66	5	
Digital input P3 function - Speed - M	In-67	6	
Digital input P4 function - Speed - H	In-68	7	

- Wire the I/O terminal and the terminal X3 of the control box CG according to the **Figure 2a**
- The P1/P2/P3/P4 inputs force desired drive function
0000 = STOP
1100 = START, 1ST SPEED
1110 = START, 2ND SPEED
1111 = START, 3RD SPEED

NOTE! If the AHU is equipped with more than 1 fan, follow **Figure 2b** for proper cabling.

* Parameter values to be determined by the user

** Parameter values to be calculated:

$$\text{motor_rated_slip} = (1 - \text{No_of_motor_poles} \cdot \text{Motor_rated_speed} / 6000) \cdot 50\text{Hz}$$

$$\text{no_load_motor_current} = 0,3 \text{ motor_rated_current}$$

$$\text{RPM_conversion_factor} = 1/60 \cdot \text{No_of_motor_poles} \cdot \text{Motor_rated_speed}$$

4. AHU WITH VTS CONTROLS TYPE: VS ... CG ACX36 EVO ... or VS ... CG uPC ...

4.1. Manual configuration of the inverters

- Set additional parameters:

Parametr	Kod	Wartość	Komentarz
All parameters visible.	Ogr	1	Without setting this parameter - only few basics parameters visible.
Command source	drv	3	Keypad buttons Run/Stop
Frequency reference source	Frq	9	Built in potentiometer
Modbus drive nr	CM-01	2	Air supply fan
		3	Air exhaust fan
		5	Air supply fan 2 /redundant
		7	Air supply fan 3
		9	Air supply fan 4
		6	Air exhaust fan 2 /redundant
Motion at speed command loss	Pr-12	8	Air exhaust fan 3
		10	Air exhaust fan 4
Time to decide speed command loss	Pr-13	30s	Stopping
			Time 30 seconds

- Wire the communication terminal of the iCS inverter according to the **Figure 3**

CAUTION! It is recommended to apply an automatic procedure for the converters' configuration, which is available in advanced options of the HMI Advanced panel.

NOTE! To restore M100 to default settings set CF93 = 1 and switch off the power supply.

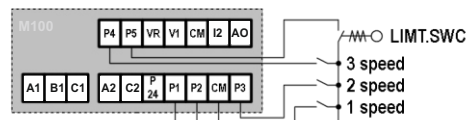


Figure 1

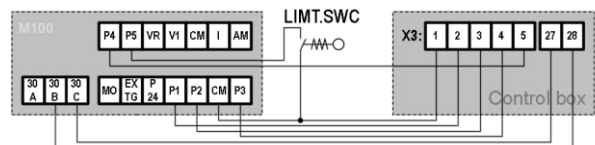


Figure 2a

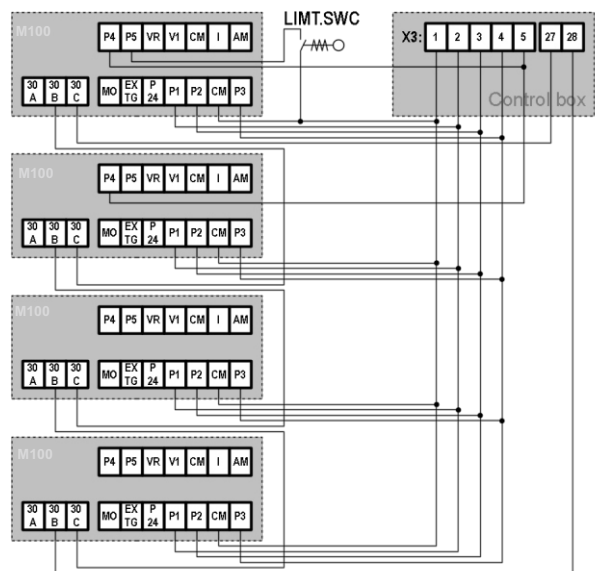


Figure 2b

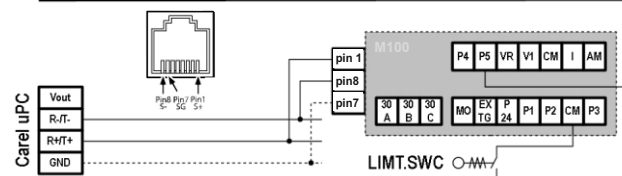


Figure 3