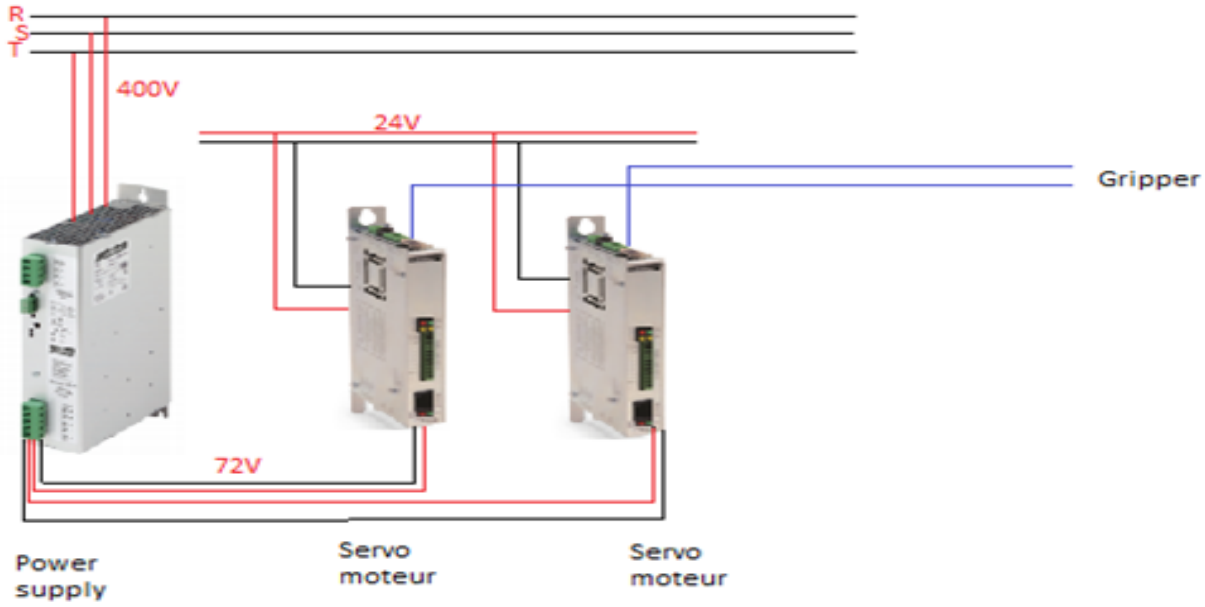
Gripper installation

1.1) Electrical part:

1.1.1) Schematic diagram:

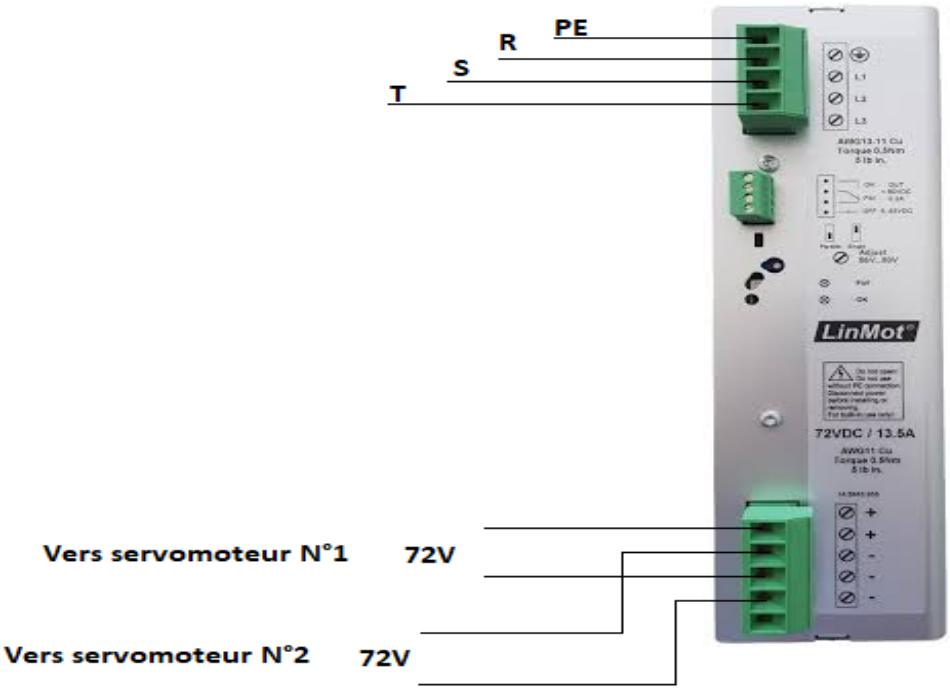


1.1.2) Wiring:

***/LINMOT S01-72/1000 :**

The LINMOT S01-72 / 1000 is intended for powering the gripper's linear motors through the servomotors which act as a switches.

It takes 400V AC three-phase as input and supplies 72V DC.



S01-72/1000

AC / DC POWER SUPPLY - PRIMARY SWITCHED · SINGLE OUTPUT

LinMot

- 960 watts output power
- Only 66mm wide
- 3 x 340-550VAC wide range input
- output: 56 - 80VDC
- Parallel connection with load sharing
- Advanced Power Boost
- Operation in any assembly position
- Primary and secundary overvoltage protection
- Overtemperature protection

1. INPUT	
Input voltage range	AC 3 x 340-550V, 50/60Hz
Efficiency	91.5% typ.
Input current limitation	< 35 A_{peak} typ. - in cold state < 70 A_{peak} typ. - in hot state
fuse	intern 3 x 6.3AT, external fuse with 16A to max. 32A necessary (C,D,K)

2. OUTPUT	
Preset range Vo	56 - 80VDC adjusted by MGV: Vo_{norm} ±0.15/0.2V
Max. output power	1000W
Max. output current	13.5A
Powerboost >0.5s - 2s:	boostbreak necessary, see diagram
Powerboost <0.5s:	no boostbreak necessary, but the boosttime in the last 4s mustn't be longer a 2s, otherwise a boostbreak 1min is necessary (boostbreak <25ms will be not recognized)
Operation indicator	green LED for Vo, red LED for error
Ripple	40mV_{ss} typ.
Noise voltage	200mV_{ss} typ.
Temperature coefficient	≤ 0.025% / K
Switch on / switch off	No Vo overshoot (soft-start)
Start-up delay	150ms typ.
Rise time	20ms typ. 155ms at 50,000 µF load
Back feeding voltage	approx. 100VDC
Serial connection	yes (max. 2 identical power supplies)
Parallel connection	yes (max. 3 identical power supplies)
battery operation	after consulting MGV possible

3. REGULATION	
Line regulation	< 0.3% for bei Ue_{min} - Ue_{max}
Load regulation	< 0.5% for Vo at Io 0 - 100% single operation < 3% for Vo at Io 0 - 100% parallel operat.
Response time	1 ms typ. at Io 20 - 80%

6. SAFETY	
	EN 60950 / VDE 0805 / VDE 113 safety class I / VDE 0100 / IP20 CSA-C22.2 No 107 / CSA-C22.2 No. 60950-1-03 UL Std. 60950-1 / UL Std. 508 (Operation in Delta mains only for UL508) pollution degree 2
Ensure fire protection by means of the surrounding housing system.	

7. OPERATING DATA	
Temperature range	-25...+70°C, integral, temperature controlled fan, air intake bottom-up
Derating	2%/K at +60°C
Weight	2.0 kg

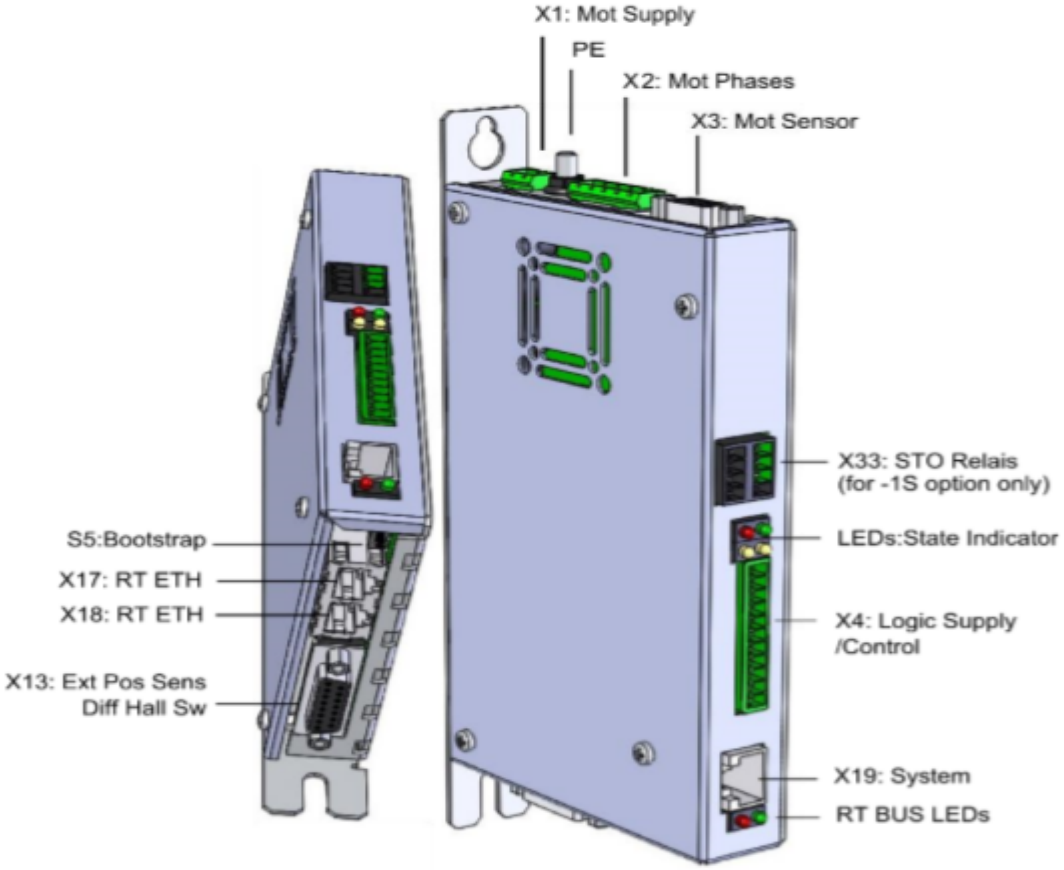
8. MECHANICS		
Connection	Main input:	4-pole 1.5-4 mm² strand / wire min. tightening torque 0.5Nm
	Load output:	5-pole 2.5-4 mm² strand / wire min. tightening torque 0.5Nm
	Control signals:	4-pole 0.5-1.5 mm² strand / wire min. tightening torque 0.22Nm
Assembly	The power supply can be directly screwed onto the wall. Please notice the assembly conditions.	

9. EXPLANATORY NOTES	
PE	**Protective conductor** **Do not use supply without PE connection!**
L1 / L2 / L3	Mains phases
+ / -	Load connection

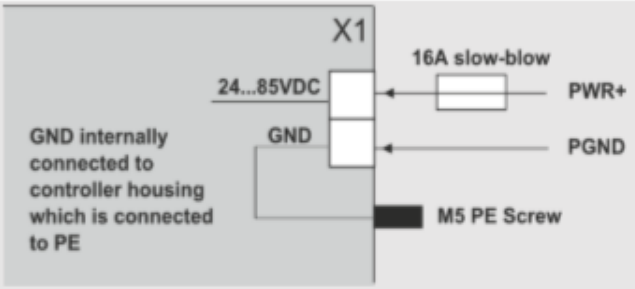
***/ LINMOT c1150-ds-xc-1s-000 servomotor:**

The C1100 series servo motors are axis controllers, with 32-bit position resolution and an integrated power stage, for linear motors...

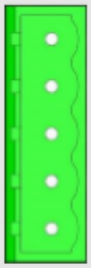
The controllers are suitable for the simplest and standard positioning of tasks with point-to-point movements.

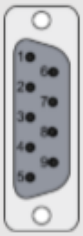


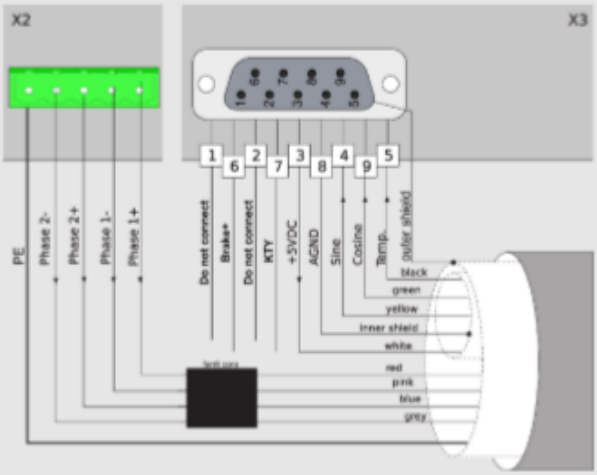
7.2 X1

X1	Motor Supply	
	PWR PGND	
Connector has to be ordered separately: see chapter 14)	Motor Supply: 72VDC nominal, 24...85VDC Absolute max. Rating: 72VDC +20%. External Fuse: 16A slow blow / min. 100VDC If motor supply voltage exceeds 90VDC, the drive will go into error state. • Use 60/75° C copper conductors only • Conductor Cross-Section 2.5mm² (AWG14) max Length 3m	

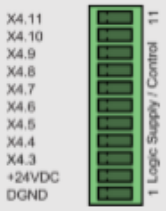
7.3 X2/X3 Motor Connection

X2	Motor Phases				
		LinMot Motor:		3-phase EC-Motor:	
	PH1+	Motor Phase 1+	red	Motor Phase U	red
	PH1	Motor Phase 1-	pink	Motor Phase V	pink
	PH2+	Motor Phase 2+	blue	Motor Phase W	blue
	PH2-	Motor Phase 2-	grey	(RR-)	
	PE/SCRN	Shield		Shield	
Connector has to be ordered separately: see chapter 14)	• Use 60/75°C copper conductors only • Conductor cross-section: 0.5 – 2.5mm² (depends on Motor current) / AWG 21 -14 • PH2- could be used as RR- with 3 phase Motors the other side of regeneration resistor has to be wired to PWR				

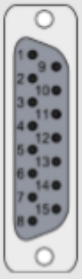
X3	Motor Sensor / Brake		
		LinMot Motor:	EC Motor:
	1	Do not connect	GND, (Do not connect before Ver.1Rev.B1)
	6	Do not connect	Brake+
	2	Do not connect	+5VDC, (Do not connect before Ver.1Rev.B1)
	7	Do not connect	KTY
	3	+5VDC	+5VDC
	8	AGND	AGND
	4	Sensor Sine	Sensor Sine / Hall Switch U
	9	Sensor Cosine	Sensor Cosine / Hall Switch V
	5	Temp In	Hall Switch W
	case	Shield	Shield
DSUB-9 (f)	**Note:** • Use +5V (X3.3) and AGND (X3.8) only for motor internal hall sensor supply (max. 100mA). • The motor cable length must not exceed 30m. • Brake+: 24V / max.500mA, Peak 1.4A (will shut down if bigger) the other terminal has to be wired to GND (X3.1) **Caution:** • Do NOT connect AGND (X3.8) to ground or earth! **Temperature Sensor:** • A resistive temperature sensor (PT1000, KTY) could be connected between +5VDC (X3.2) and KTY (X3.7)		



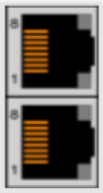
7.4 X4

X4	Logic Supply / IO Connection			
	11	AnIn-	X4.11	Configurable differential analog Input (with X4.10)
	10	AnIn+	X4.10	Configurable differential analog Input (with X4.11)
	9	AnIn	X4.9	Configurable single ended analog Input
	8	In	X4.8	Configurable digital Input
	7	In	X4.7	Configurable digital Input
	6	In	X4.6	Configurable digital Input
	5	In	X4.5	Configurable digital Input
	4	Out	X4.4	Configurable digital Output
	3	Out	X4.3	Configurable digital Output
	2	+24VDC	Supply	Logic Supply 22-26 VDC
	1	GND	Supply	Ground
DSUB-9 (f) Spring cage connector (has to be ordered separately: see chapter 14)	Inputs (X4.5 ... X4.8): 24V / 5mA (Low Level: –0.5 to 5VDC, High Level: 15 to 30VDC) Outputs (X4.3 & X4.4): 24V / max.500mA, Peak 1.4A (will shut down if exceeded) Analog inputs: 10 bit A/D converted X4.9: Single ended analog input to GND, 0..10V, Input Resistance: 51kΩ to GND X4.10/X4.11: Differential analog input, +/- 10V. Common mode range: +/- 5VDC to GND, Input Resistance 11.4kΩ for each signal to GND. - Use 60/75°C copper conductors only - Conductor cross-section max. 1.5mm² - Stripping length: 10mm - The 24VDC supply for the control circuit (X4.2) must be protected with an external fuse (3A slow blow)			

7.6 X13

X13	External Position Sensor Differential Hall Switches		
		ABZ with Hall Switches	SSI* / BiSS-B** / BiSS-C**
	1	+5V DC	+5V DC
	9	A+	A+ (optional)
	2	A-	A- (optional)
	10	B+	B+ (optional)
	3	B-	B- (optional)
	11	Z+	Data+
	4	Z-	Data-
	12	Encoder Alarm (optional)	Encoder Alarm (optional)
	5	GND	GND
	13	U+	nc
	6	U-	nc
	14	V+	nc
	7	V-	nc
	15	W+	Clk+
	8	W-	Clk-
	case	Shield	Shield
DSUB-15 (f)	Position Encoder Inputs (RS422): Max. counting frequency: 10 Mcounts/s with quadrature decoding, 100ns minimal edge separation Differential Hall Switch Inputs (RS422): Input Frequency: <1kHz Enc. Alarm In: 5V / 1mA Sensor Supply: 5VDC max 100mA (300mA since firmware version 6.7)		
*	Since firmware version 6.6		
**	Since firmware version 6.7		

7.7 X17 – X18

X17 – X18	RealTime Ethernet 10/100 Mbit/s (on EC and PN drives only)	
	X17 RT ETH In X18 RT ETH Out	Specification depends on RT Bus. Please refer to according documentation.
RJ-45		

7.8 X19

X19	System	
	1	(Do not connect)
	2	(Do not connect)
	3	RS232 Rx
	4	GND
	5	GND
	6	RS232 Tx
	7	(Do not connect)
	8	(Do not connect)
	case	Shield
RJ-45	Use isolated USB-RS232 converter (Art.-No. 0150-2473) for configuration over RS232	

7.9 X33

X33	Safety Relays (only with the -1S option)		
	4 / 8	Ksr +	Safety Relay 1 / 2 Input positive
	3 / 7	Ksr -	Safety Relay 1 / 2 Input negative
	2 / 6	Ksr f+	Safety Relay 1 / 2 feedback positive
	1 / 5	Ksr f-	Safety Relay 1 / 2 feedback negative
Spring cage connector (has to be ordered separately: see chapter 14)	- Use 60/75°C copper conductors only - Conductor cross-section max. 1.5mm² - Stripping length: 10mm **- Never connect the safety relays to the logic supply of the drive!** → For detailed information see chapter 9 Safety Wiring.		

7.12 S5

S5	Bootstrap (on EC and PN drives only)	
	S5	Bootstrap (Internal use only)

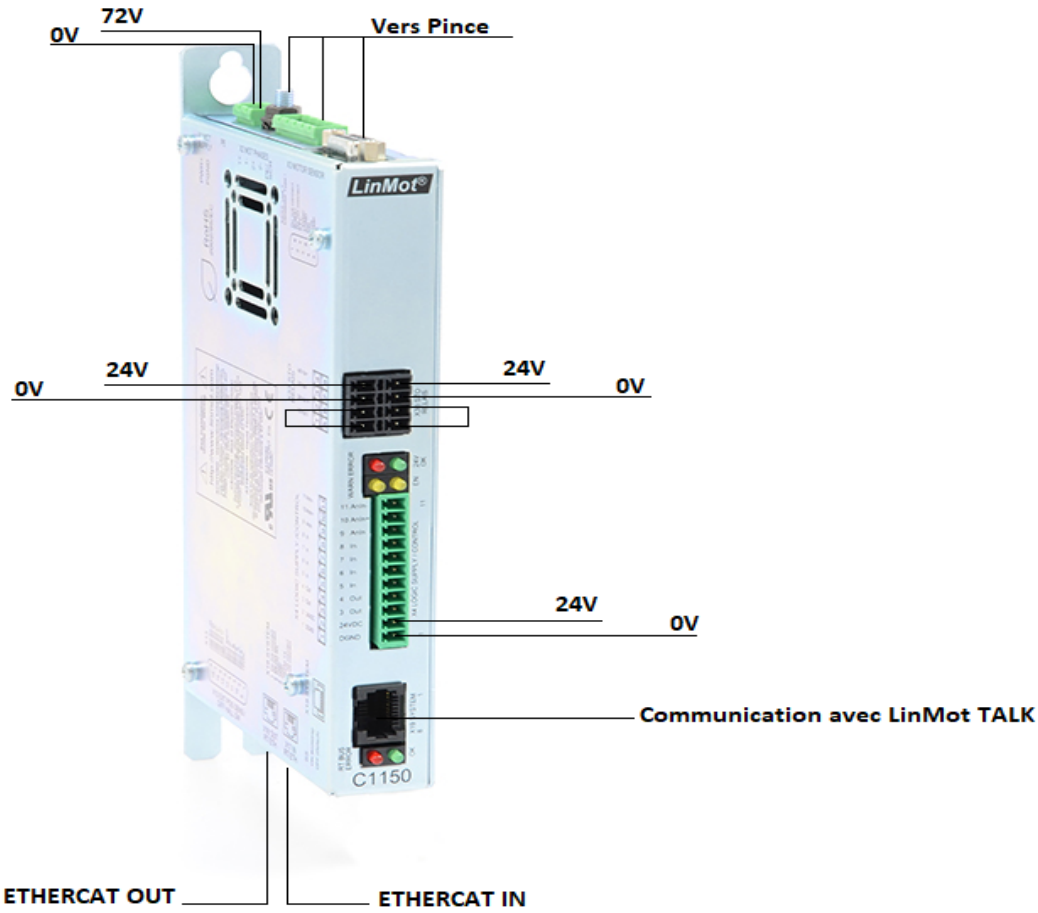
7.13 LEDs

LEDs	State Displays		
	Signal:	**Color:**	**Description:**
	24VOK	Green	24V Logic Supply OK
	EN	Yellow	Motor Enabled / Error Code Low Nibble
	Warn	Yellow	Warning / Error Code High Nibble
	Error	Red	Error

7.14 RT Bus LEDs

RT Bus LEDs	RT Bus State Display		
	Signal:	**Color:**	**Description:**
	OK	Green	OK
	RT BUS ERROR	Red	Error
	The use of these LEDs depends on the type of fieldbus which is used. Please see the corresponding manual for further information		

⇨ **Real wiring :**



1.1.3/ Real scheme:

1.2/Mechanical part:

The gripper is properly installed on the robotic arm, we no longer have the problem of collision of the gripper with the robot during homing.

1.3/Software part:

In order to control the gripper there are three possibilities:

+ Control with LinMot Talk software

+ Control with Motion Perfect software

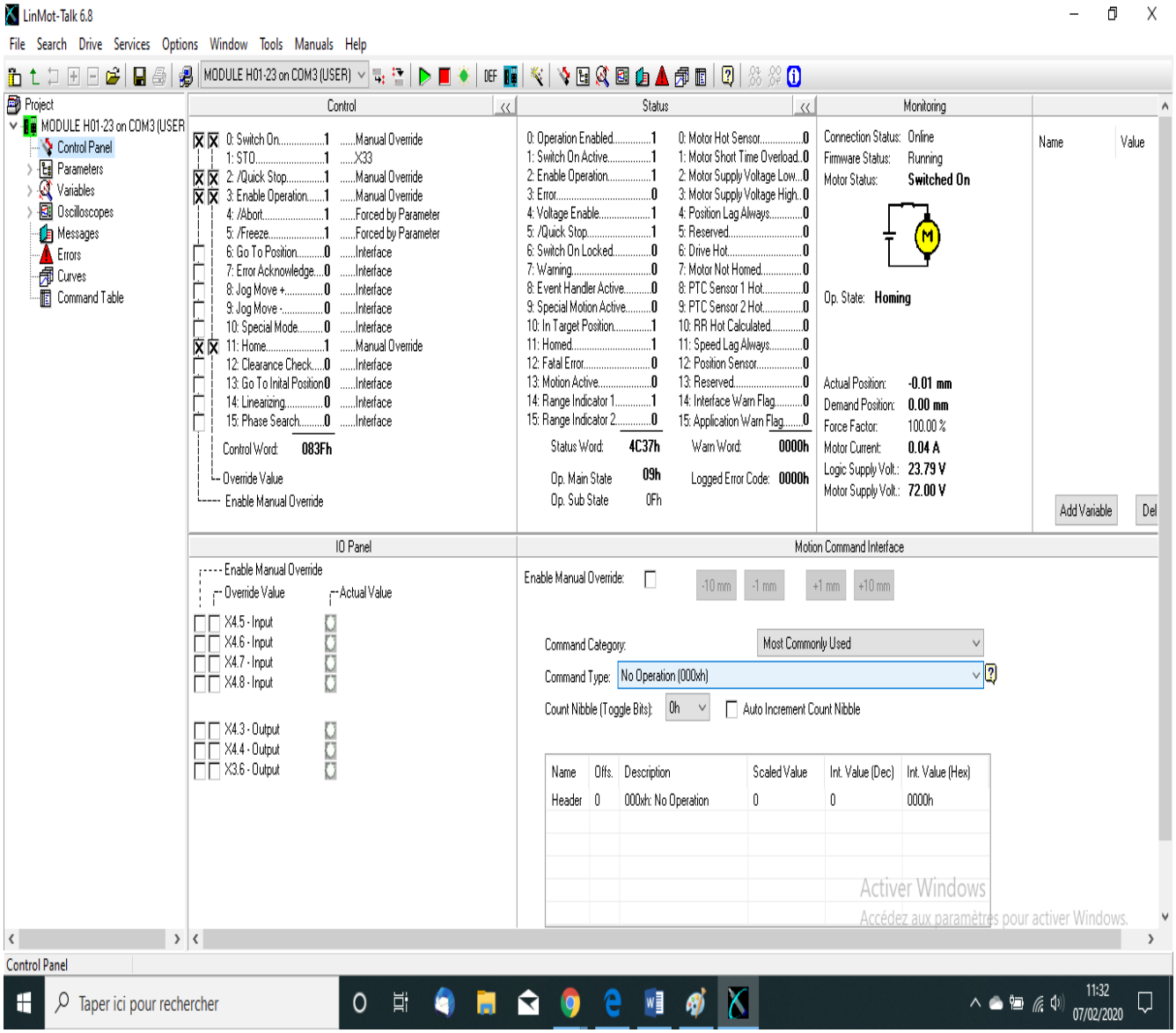
+Control with ROS

1.3.1/ Control with LinMot Talk software:

Every part of the gripper could be controlled separately with linmot talk, after connecting the servomotor to the laptop through the USB.

These boxes are to be ticked by order:

1: Switch On 2: /Quick Stop 3: Enable operation 11: Home


LinMot-Talk 6.8
File Search Drive Services Options Window Tools Manuals Help
MODULE H01-23 on COM3 (USER)
Project
MODULE H01-23 on COM3 (USER
Control Panel
Parameters
Variables
Oscilloscopes
Messages
Errors
Curves
Command Table
Control
0: Switch On.....1 .....Manual Override
1: STO.....1 .....X33
2: /Quick Stop.....1 .....Manual Override
3: Enable Operation.....1 .....Manual Override
4: /Abort.....1 .....Forced by Parameter
5: /Freeze.....1 .....Forced by Parameter
6: Go To Position.....0 .....Interface
7: Error Acknowledge....0 .....Interface
8: Jog Move +.....0 .....Interface
9: Jog Move -.....0 .....Interface
10: Special Mode.....0 .....Interface
11: Home.....1 .....Manual Override
12: Clearance Check....0 .....Interface
13: Go To Inital Position0 .....Interface
14: Linearizing.....0 .....Interface
15: Phase Search.....0 .....Interface
Control Word: 083Fh
Override Value
Enable Manual Override
Status
0: Operation Enabled.....1
1: Switch On Active.....1
2: Enable Operation.....1
3: Error.....0
4: Voltage Enable.....1
5: /Quick Stop.....1
6: Switch On Locked.....0
7: Warning.....0
8: Event Handler Active.....0
9: Special Motion Active.....0
10: In Target Position.....1
11: Homed.....1
12: Fatal Error.....0
13: Motion Active.....0
14: Range Indicator 1.....1
15: Range Indicator 2.....0
0: Motor Hot Sensor.....0
1: Motor Short Time Overload..0
2: Motor Supply Voltage Low...0
3: Motor Supply Voltage High..0
4: Position Lag Always.....0
5: Reserved.....0
6: Drive Hot.....0
7: Motor Not Homed.....0
8: PTC Sensor 1 Hot.....0
9: PTC Sensor 2 Hot.....0
10: RR Hot Calculated.....0
11: Speed Lag Always.....0
12: Position Sensor.....0
13: Reserved.....0
14: Interface Warn Flag.....0
15: Application Warn Flag.....0
Status Word: 4C37h
Warn Word: 0000h
Op. Main State 09h
Logged Error Code: 0000h
Op. Sub State 0Fh
Monitoring
Connection Status: Online
Firmware Status: Running
Motor Status: Switched On
Op. State: Homing
Actual Position: -0.01 mm
Demand Position: 0.00 mm
Force Factor: 100.00 %
Motor Current: 0.04 A
Logic Supply Volt.: 23.79 V
Motor Supply Volt.: 72.00 V
Name
Value
Add Variable
Del
IO Panel
Enable Manual Override
Override Value
Actual Value
X4.5 - Input
X4.6 - Input
X4.7 - Input
X4.8 - Input
X4.3 - Output
X4.4 - Output
X3.6 - Output
Motion Command Interface
Enable Manual Override:
-10 mm
-1 mm
+1 mm
+10 mm
Command Category: Most Commonly Used
Command Type: No Operation (000xh)
Count Nibble (Toggle Bits): 0h
Auto Increment Count Nibble
Name Offs. Description Scaled Value Int. Value (Dec) Int. Value (Hex)
Header 0 000xh: No Operation 0 0 0000h
Activer Windows
Accédez aux paramètres pour activer Windows.
Control Panel
Taper ici pour rechercher
11:32
07/02/2020