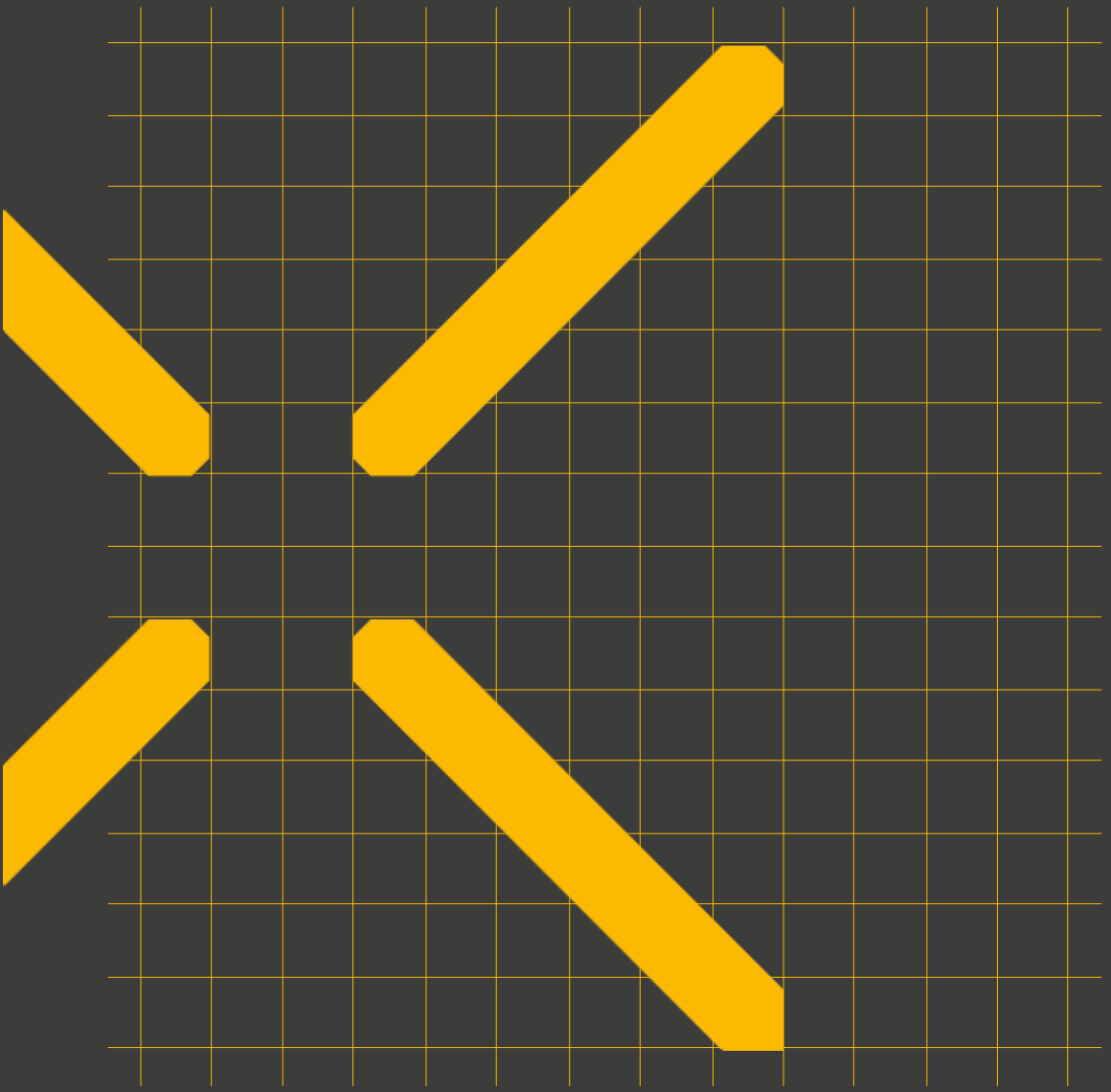


LIFTKIT YA 630

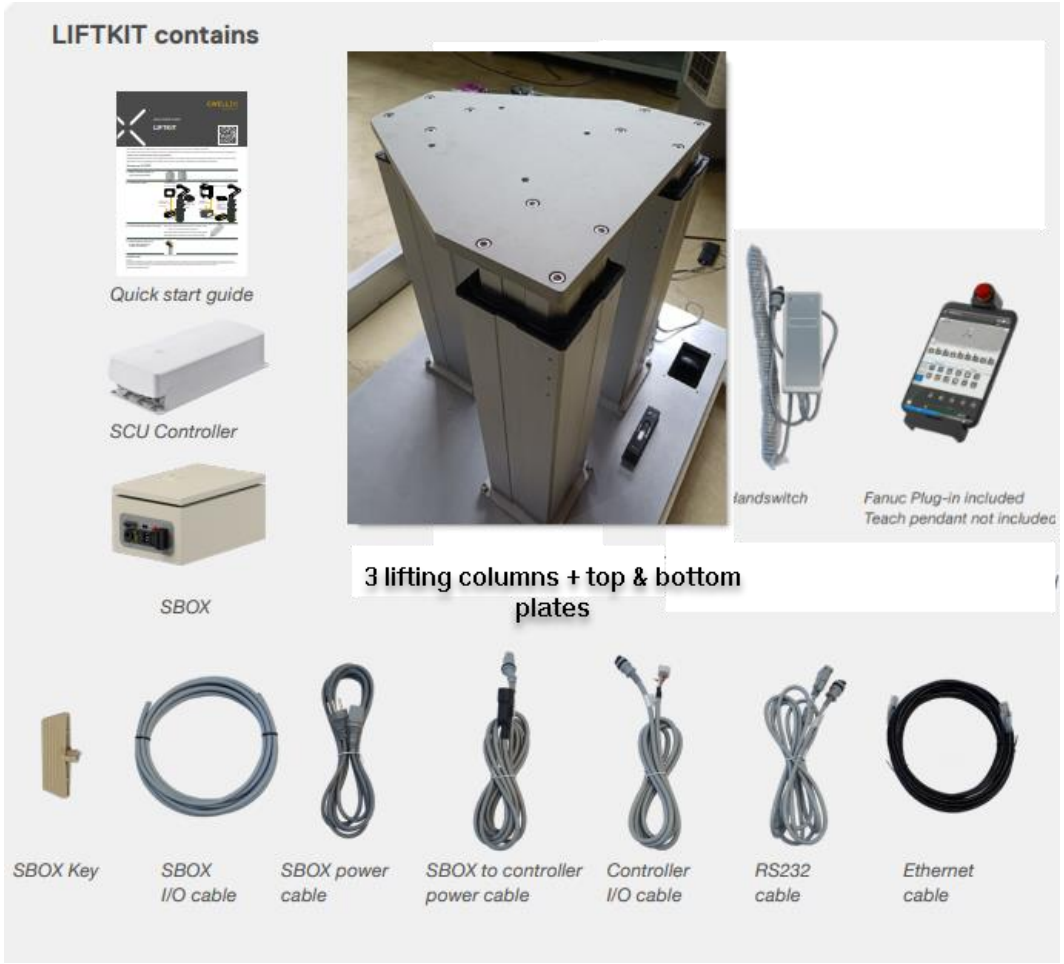
For YASKAWA very large cobot

HC20 & 30

02. Scope of delivery for the LIFTKIT FA 630 with T&B plate

What's included on the LIFTKIT XL package:

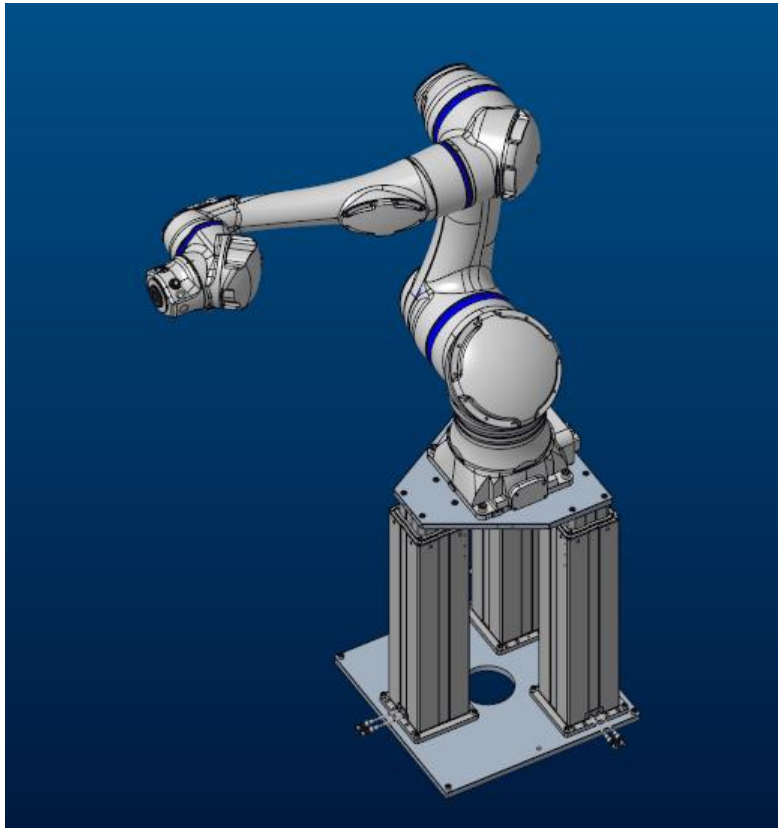
1. 3 lifting columns to make one LIFTKIT XL
2. Top plate compatible with HC20 & HC30
3. Bottom plate section 610 mm
4. 1 control unit SCU (to synchronize of the 3 lifting columns)
5. Power supply is included in the SCU (230 VAC or 110 VAC)
6. Hand switch with 3 memory positions
7. SBOX Including TCP/IP communication & safety relay
8. Yaskawa Plugin – see slide 6 to 13
9. Diagnostic tool to measure the current (important for alignment of the columns)



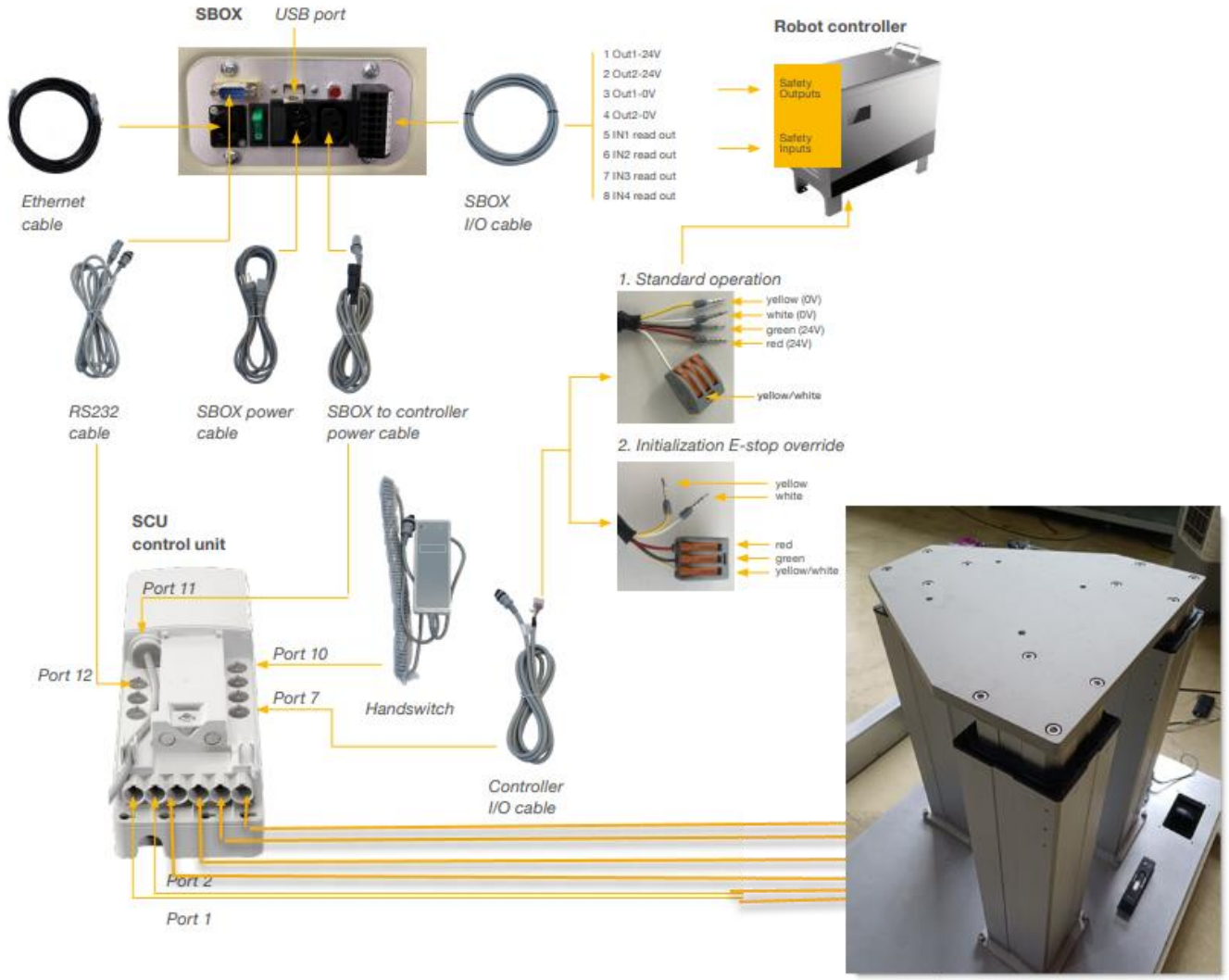
03. Technical data for LIFTKIT XL

Technical characteristics for the system of 3 lifting columns:

- Stroke: 500 to 900 mm (other strokes are possible on request)
- Retracted length = stroke/2 + 275 mm
- Speed: 50 to 65 mm/s
- Power supply: 220 VAC or 110 VAC
- Duty cycle: 10 %
- Maximum lifting force: 3,000 N for the combination of 3 lifting columns (one LIFTKIT XL)
- Maximum dynamic bending moment = 1,000 Nm
- Maximum static bending moment = 7,000 Nm
- IP40
- Lifetime ~ 100,000 cycles
- Temperature range: 10 to 40 °C



04. LIFTKIT connection setup



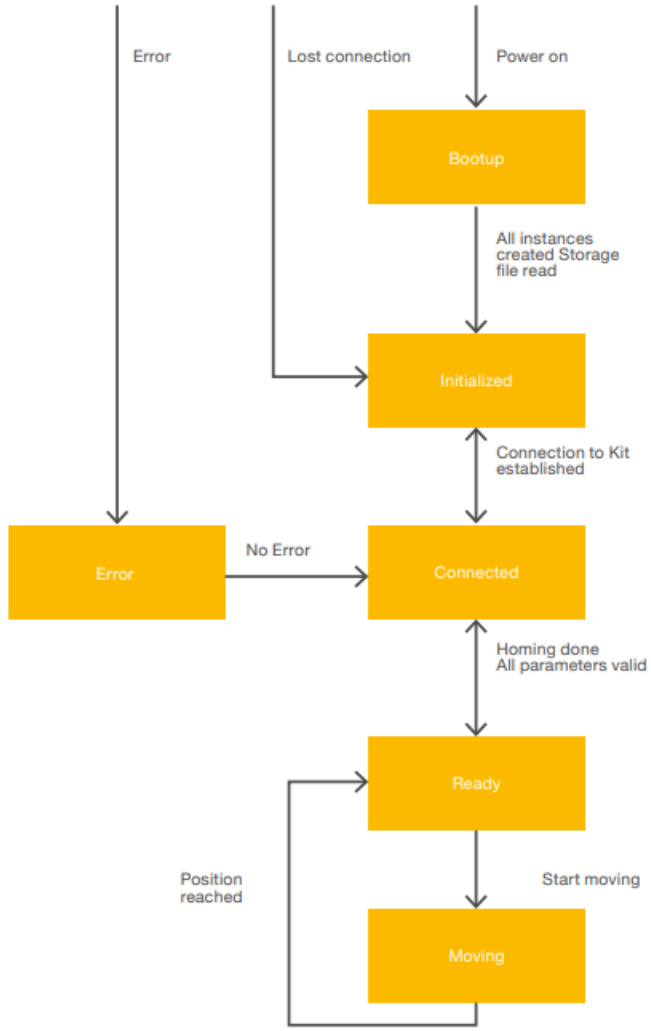
04. Control via Ethernet TCP/IP scripts commends

7.3 Commands

Several commands can be used to communicate with the SBOX-L-01. Consider, that they only work in the allowed state.

Command	Allowed state
moveTo_absolutePosition	Ready
stop_moving	Moving
get_position	Connected, Ready, Moving, Error
get_stroke	Connected, Ready, Moving, Error
get_status	Initialized, Connected, Ready, Moving, Error
set_virtualLimits	Connected, Ready
get_virtualLimits	Connected, Ready, Moving, Error
set_type*	Initialized, Connected, Ready, Error
get_type	Initialized, Connected, Ready, Moving, Error
get_typesAvailable	Initialized, Connected, Ready, Moving, Error

* Virtual limits must be set again after changing the type, then restart.



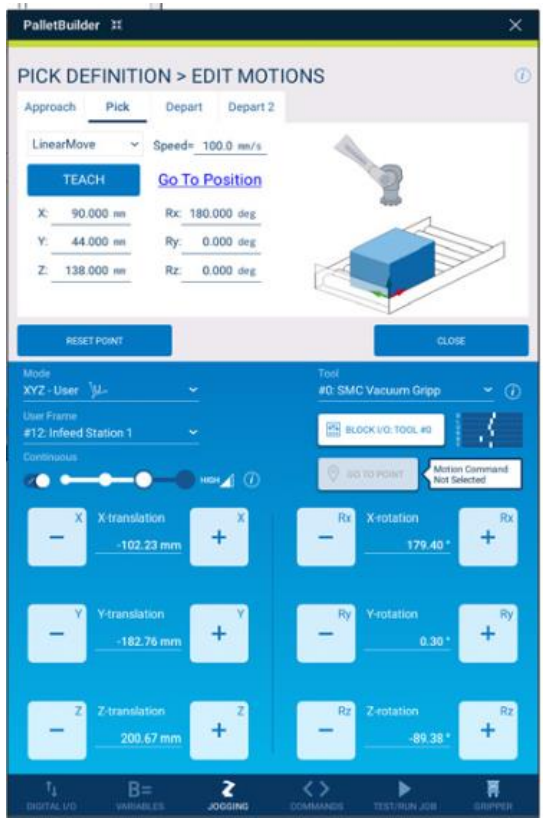
Parameter 1	Parameter 2	Description
INITIALIZED	Cause	Liftkit is not connected to the SBOX-L-01 or no connection is established
CONNECTED	Cause	Liftkit is connected, but no homing is performed, or Column is not valid
READY		Liftkit is ready to use, but no movement is performed
MOVING		Liftkit is moving to the desired position
ERROR	Cause	An error appeared

Plugin compatibility

Smart Pendant

Stander pendant

Palletizing software Yaskawa pallet builder



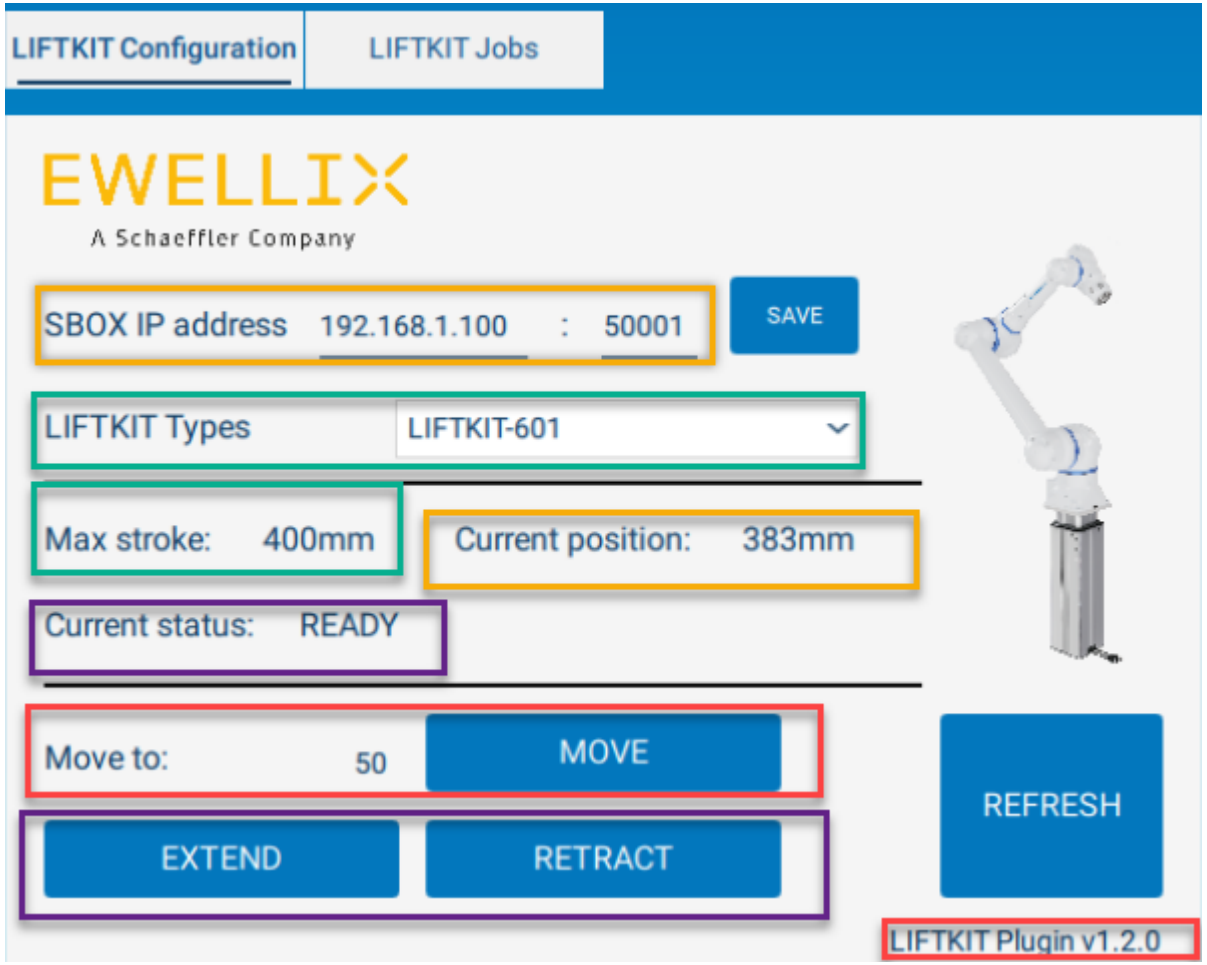
LIFITKIT Configuration (initialization) :

What we can set :

- Set the IP address & Port n°
- Select the LIFTKIT type
- Move up & down with jog button
- Move the pillar to absolute position

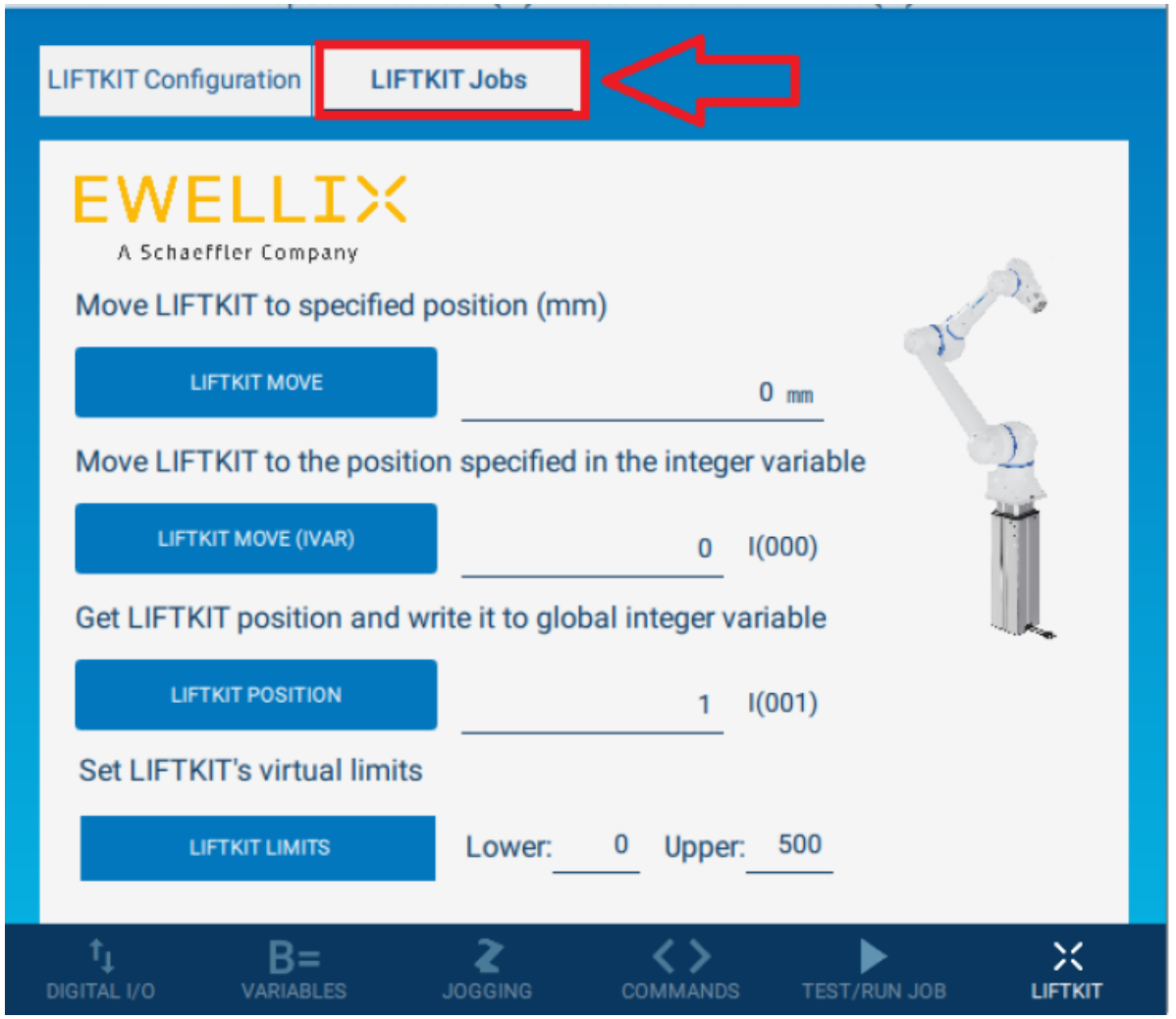
We can read :

- The current position
- The max stroke
- The status ‘’ ready, not connected …… ‘’
- Plugin version



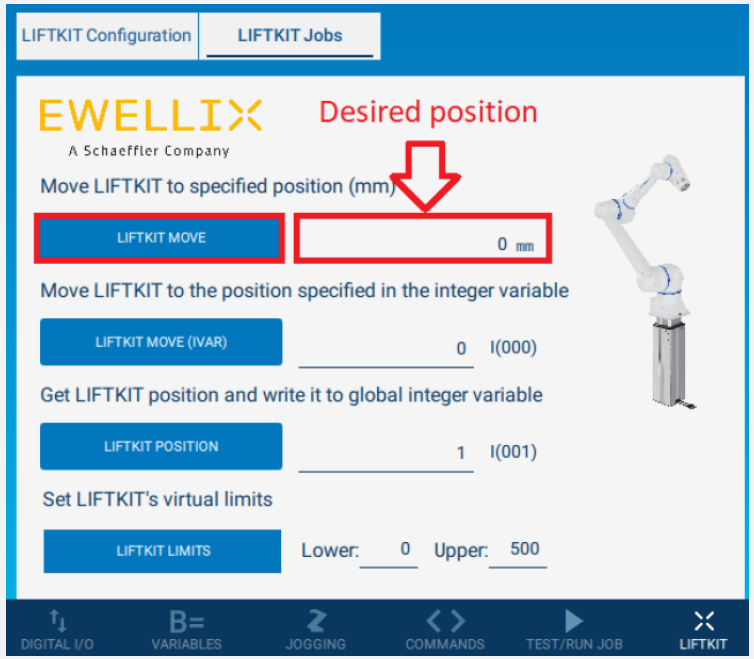
LIFTKIT Job

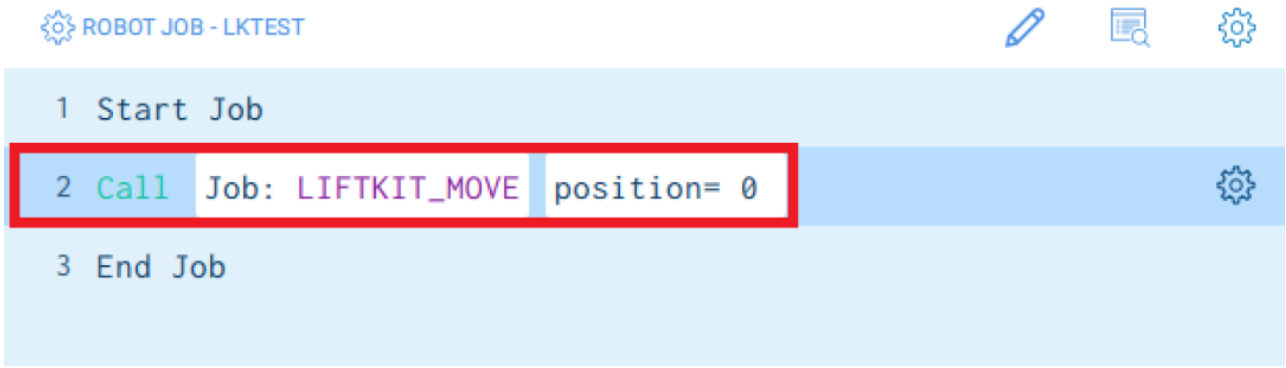
- LIFTKIT Move
- LIFTKIT Move (VAR)
- LIFTKIT Get Position
- LIFTKIT LIMITS



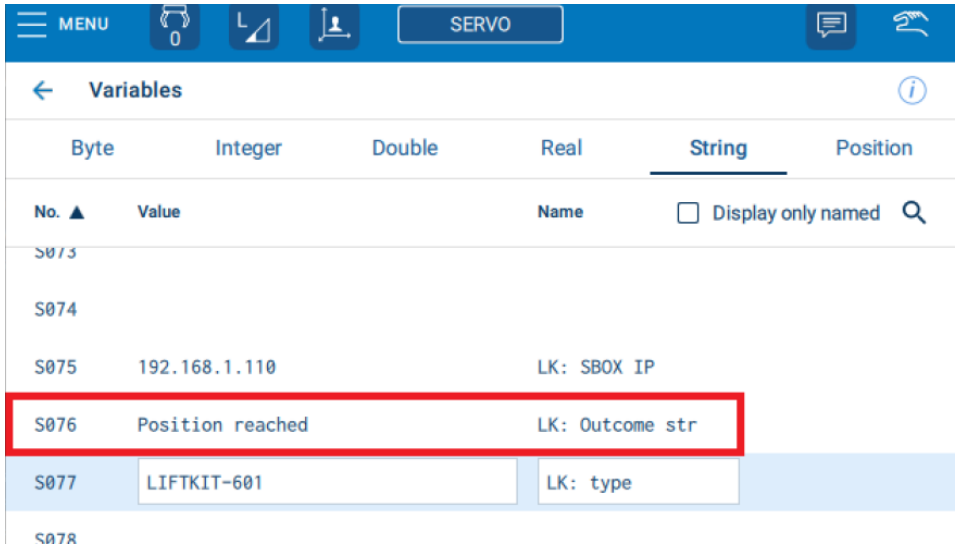
LIFTKIT instruction (move)

This instruction enable the customer to set the desired position of the LIFTKIT directly form Yaskawa IHM



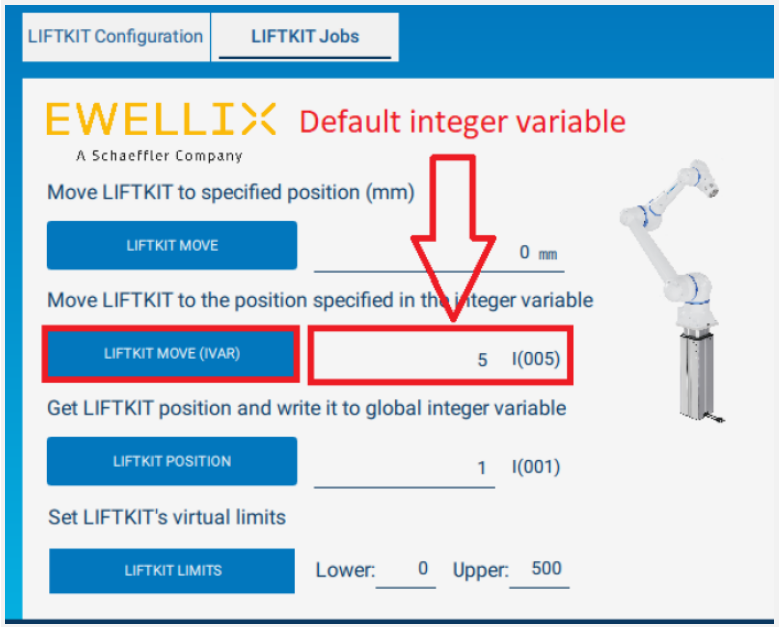


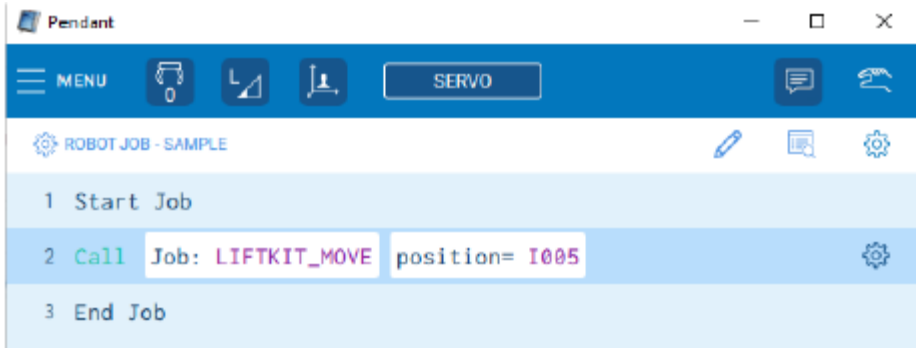
When the program is started, LIFTKIT will move to the position specified as LIFTKIT MOVE argument. When movement is finished “Position reached” is written in S076 string variable



LIFTKIT instruction (LIFTKIT Move (VAR)

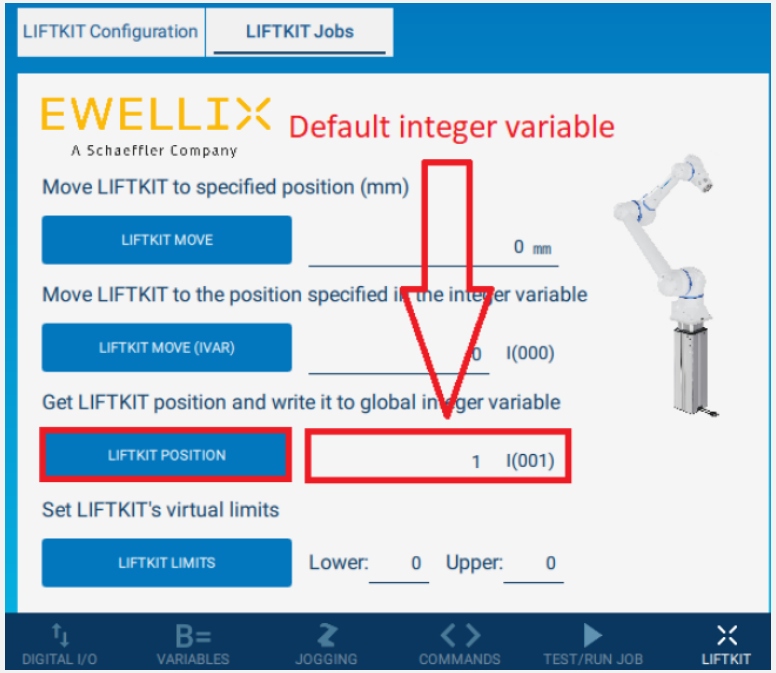
the LIFTKIT will move to the target position specified in Register,

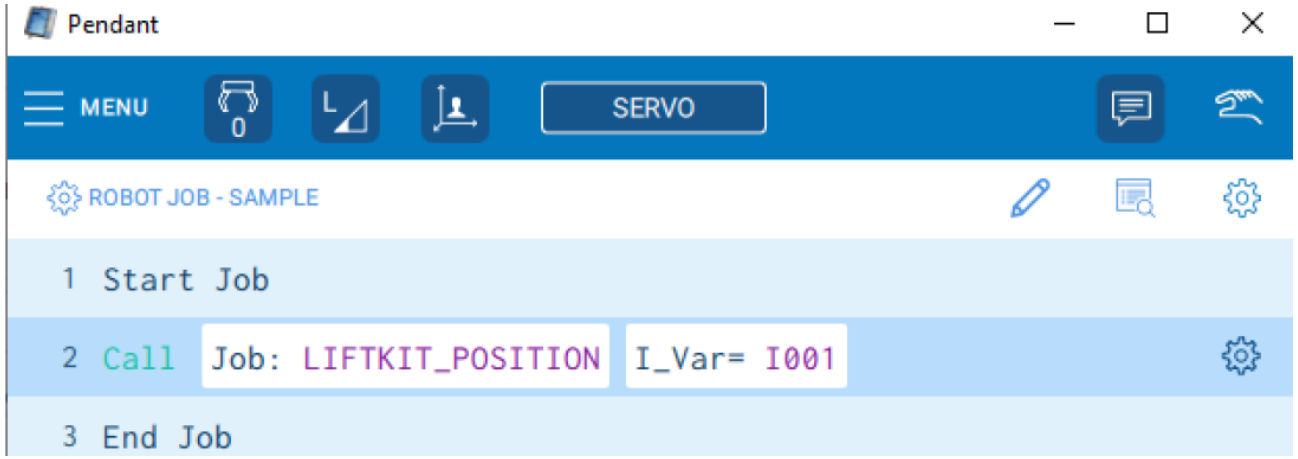




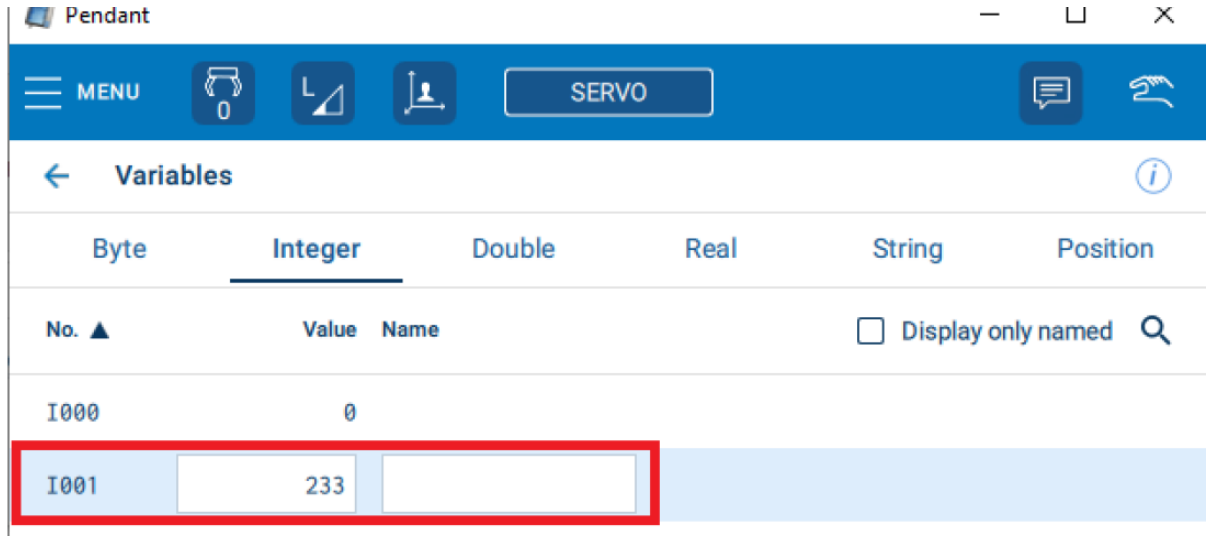
LIFTKIT instruction (LIFTKIT Get Position)

The LIFTKIT Get Position obtains the LIFTKIT Position from the SBOX and stores the value in the specified String registers



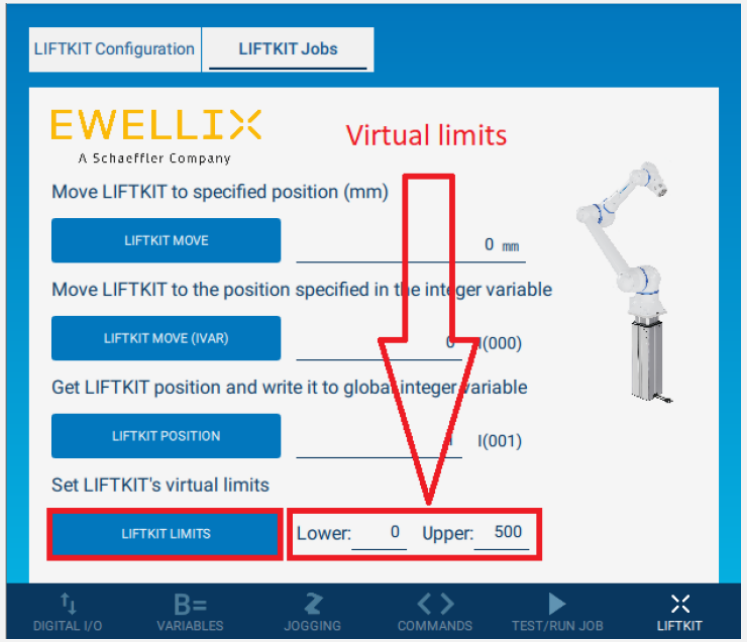


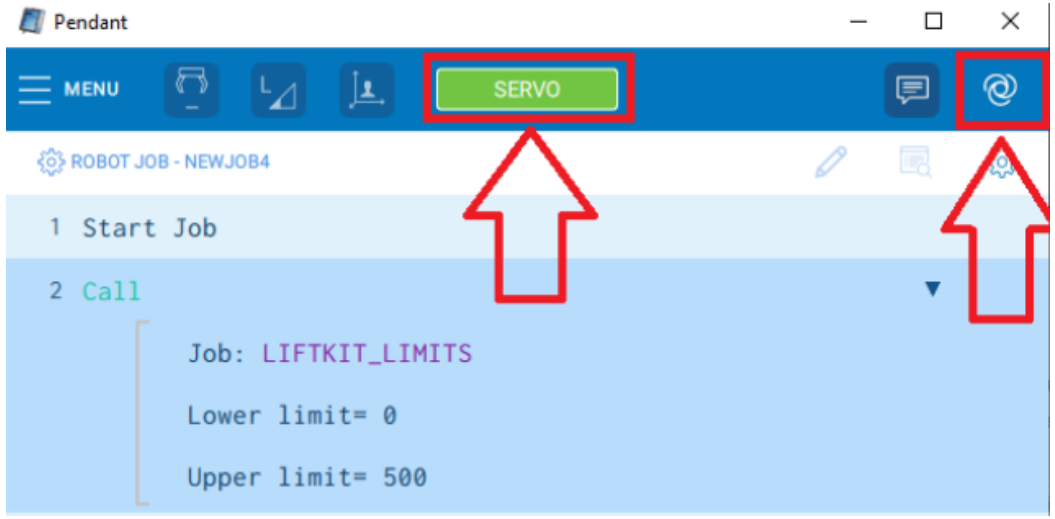
When the program is started, LIFTKIT current position is written in integer variable specified as argument. In this case LIFTKIT current position is written in I001.



LIFTKIT LIMITS

LIFTKIT LIMITS job is used to set virtual limits of LIFTKIT.





validate if limits are successfully set check the value of B078, If value is equal to 15, that means LIFTKIT LIMITS is successfully executed.

Outcome str - 076	Outcome code - B078	description
PAUSED/STOPPED program	12	LIFTKIT MOVE job is paused, stopped or safety was triggered
Ready for movement	13	LIFTKIT INIT was successful and LIFTKIT is ready to operate
Position successfully obtained	14	Position is successfully written in specified Integer variable
Limits successfully set	15	LIFTKIT LIMITS successfully set Virtual limits

Trouble shooting (page 46 to 54)

Via String instruction S078 or outcome code B078 see example below

SBOX communication error (Outcome code 43)

Issue: Connection to SBOX Service could not be established

Possible causes:

- SBOX Service is not running
- SBOX Service is running but connection was not successful
- Another Client is already connected to the SBOX Service
- SBOX/RPI is powered off
- Ethernet connection between robot and SBOX is broken
- SBOX cannot be pinged

Solution(s):

- Restart SBOX Service. (Power off/on SBOX)
- Check hardware connection with the SBOX/RPI
- Check if SBOX/RPI is powered on
- Restart SBOX Service. (Power off/on SBOX)

Max stroke / Virtual limits variables could not be found

Figure 99

Max stroke or Virtual limits variable could not be found

Issue: Virtual limits and max stroke could not be stored in variables.

Possible causes:

- Max stroke variable is deleted
- Upper limit variable is deleted
- Lower limit variable is deleted
- Invalid LIFTKIT type is selected

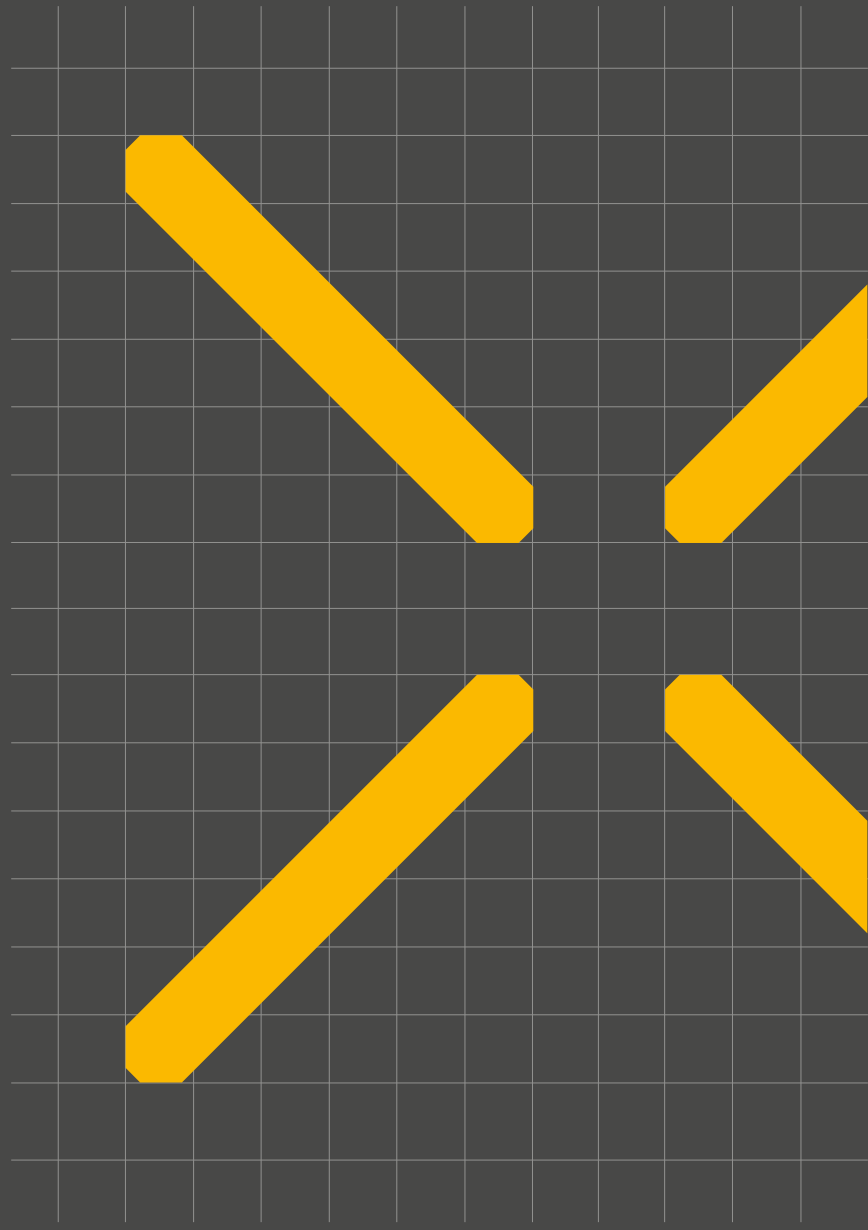
Solution(s):

- Check Integer global variables I076 - Upper limit, I077 - Lower limit, I078 - Max stroke. If one of the three does not exist, add it
- Chose appropriate LIFTKIT type

07. Assembly recommendations

- We supply a diagnostic tool that allows the user to measure the current, without any load, to ensure that the alignment is correct. The current measured per channel must not exceed 2.5 Amps.
- When the robot is mounted and moving a load, the actual current must not exceed 5 Amps per channel and the total consumption o the 6 channels should not exceed 24 Amps . If these conditions are met, it's a good indication that assembly and alignment are correct. And the lifting columns will operate in good conditions.

Thank you!



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