WELCOME TO THE WORLD OF KISTLER

NCFL, Type 2167B - maXYmos NC, Quick Guide



KISTLER
measure. analyze. innovate.

www.kistler.com.cn

1. 1 Safety instructions

The NC joining system has been manufactured and tested with qualified safety technical measures, and left the factory in faultless, technically safe condition. To maintain this condition and to ensure safe operation, users must comply with the instructions and warnings contained in this manual or imprinted on the monitor.

Country-specific regulations
For export, strictly comply with the applicable rules and regulations concerning accident prevention and operating provisions in the destination country.

1. 2 Unpacking

Check all packaging of the delivery for any transport damage. Immediately report transport damage to the carrier and Kistler sales organization or agency.

1. 3 Transportation and storage

The NC joining module is delivered in stable wood packaging.
If the components are stored for long periods of time, the following precautions should be taken:

- Store the components in the original packing.
- Store the components so that no mechanical forces, vibrations, etc. can affect them.
- The temperature must be between 0 ... 50 °C.
- There must be no dirt in or on the components.
- The Environment must be dry, condensation must be avoided.
- Aggressive media are not allowed in the surroundings.
- BNC connectors must be covered with a non-short-closing dust cap.

1. 4 Disposal

Old electronic equipment must not be disposed of in general waste or household garbage. Please return disused equipment for disposal at the nearest electronics recycling center or contact your Kistler sales organization.



1. 5 Care/Handling of the MEM and DIM



The DIM has a touchscreen and is delivered without protective foil. The DIM touchscreen should be frequently cleaned with a fluff-free cloth and off-the-shelf cleaning agent suitable for touchscreens. During cleaning the pressure on the screen should not be too high. We recommend switching the device off during cleaning.



The products must only be opened, repaired and maintained by qualified Kistler staff. When opening the devices all warranty claims to Kistler expire. The devices must be protected of mechanical damage and handled with care.

Content

System overview 4

Mechanical structure 5

Wiring guidance 6

Power – On/ First switching On Guide 11

Jogging mode and Automatic mode 13

MP setup 14

PLC Debugging 19

Maintenance 31

- The product is delivered in a condition free of faults and technically safe. To maintain this condition and ensure safe operation, the user must observe the instructions and warnings in this manual or displayed on the monitor.



According to the Machinery Directive 2006/42/EC ("3C"), the NC joining system is an incomplete machine. It is designed for installation in other capital goods (e.g. automation or assembly systems). The system integrator is obliged to install the servo press system in accordance with the applicable regulations of the Machinery Directive and the applicable accident prevention regulations. The responsibility for installing safety guarding devices, safety switches, and any additional necessary safety measures lies with the system integrator. The system integrator must carry out an appropriate risk and hazard analysis and take corresponding measures.

Changes to the contents of this manual and the corresponding appendices are subject to alteration without prior notice. Kistler reserves the right to make technical modifications to the product without assuming responsibility for notifying such changes. Except as required by applicable laws and regulations, Kistler shall not be liable for any "loss" arising from this manual or its use. © 2026, Kistler Group. All rights reserved. No part of this manual may be reproduced in any form, nor transmitted, without the prior express written permission of Kistler Group.

System overview

Functional principle with maXYmos NC Type 5847C...

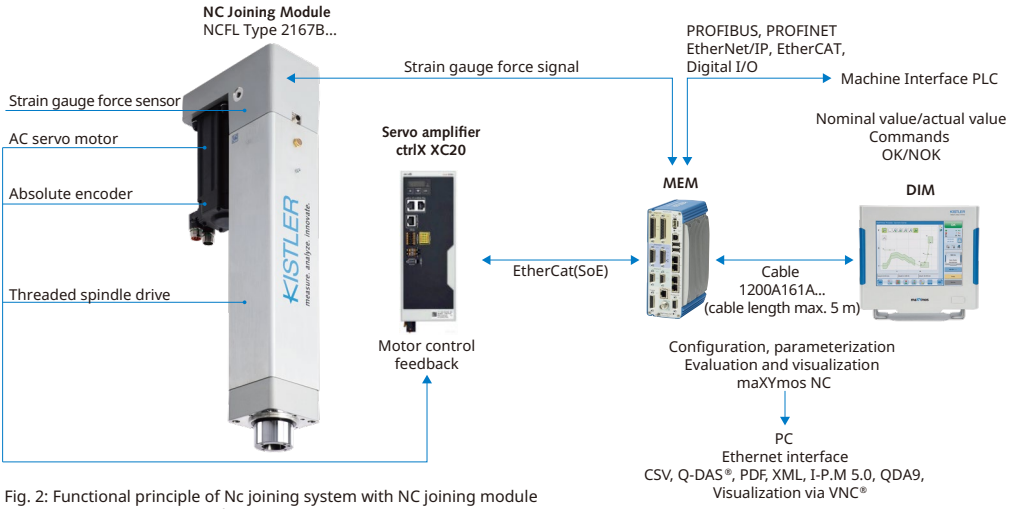


Fig. 2: Functional principle of Nc joining system with NC joining module NCFL Type 2167B.. and maXYmos NC Type 5847C...

The NC Joining system has three cable connections

1) Power cable (press - drive XD03)
2) Encoder cable (press - drive XG20)
3) Force sensor cable and measurement module X12 connection



Installation Notes

- Avoid radial force
- Avoid collision
- Debugging speed less than 10mm/s
- Max. jogging speed <10 mm/s
- Max. tooling weight is limited as datasheet
- Maximum assembly weight is limited

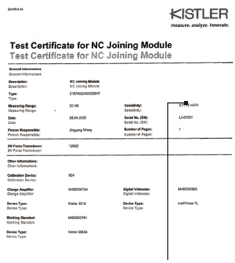
CAUTION

Please take care NFC anti-counterfeiting label in red circle, removal or damage will lost warranty.

System Label

- All main component labels contain serial numbers
  - If there are multiple sets of the same model equipment, they cannot be cross-mixed
- Force sensor calibration parameters (sensitivity coefficient) can be found in the factory report.





Pressure Sensor Sensitivity Coefficient

Mechanical structure

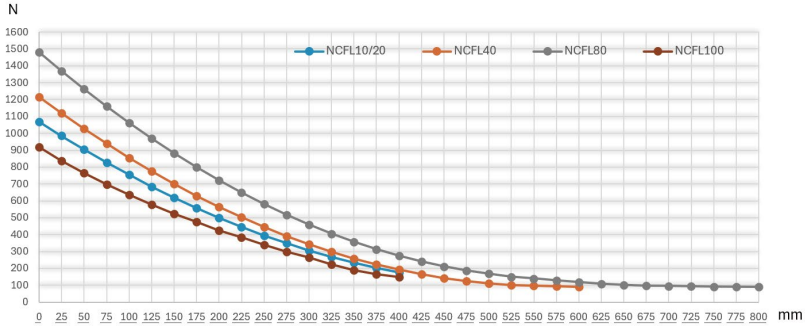
Mechanical structure

Specifications		Assembly	NCFL 10/20	NCFL 40	NCFL 80	NCFL 100
Nominal joining force		[kN]	10 / 20	40	80	100
Gear ratio			-	4 : 1	4 : 1	5 : 1
Belt gear ratio			22 : 34	34 : 44	44 : 44	55 : 55
Total gear ratio			22 : 34	136 : 44	176 : 44	275 : 55
Movement speed		[mm/s]	250	250	200	150
Spindle pitch		[mm/U]	5	10	10	10
Short stroke operation		[mm]	≤70*	≤120*	≤120*	≤120*
Maximum tool weight without holding brake		[kg]	50	100	100	100
Weight	Stroke 200mm	[kg]	30	60.5		
	Stroke 400mm	[kg]	38.5	70.5	104	158
	Stroke 600mm	[kg]		85	120	
	Stroke 800mm	[kg]			136	
Flange assembly			4xM8	4xM10	6xM16	8xM16
Depth		[mm]	24	24	40	40
Tightening torque screws		[N·m]	16****	40****	100****	100****
Fastening screws Tool			4xM6	6xM6	12xM8	12xM8
Tap hole/Depth		[mm]	14	14	16	16
Tightening torque screws		[N·m]	10***	10***	25***	25***
Reverence value valid for standard (on flange attachment)		[mm]	50**			

* If the NC joining module is operated in the short stroke, every 10 000 double strokes a lubrication stroke greater than the short stroke is to be performed.
** See also nameplate and chapter "Maintenance/Referencing"
*** Recommended screw strength class 8.8
**** Recommended screw strength class 12.9

Permissible radial force

Permissible radial forces Type 2167B... NCFL 10 ... 100 kN



Wiring guidance



- The following circuit diagram is a recommendation. The manufacturer/control engineer must check the system for its usability, taking into account its risk and hazard analysis and the consequent dedicated Performance Level(SIL). In particular, make certain that the corresponding rules and regulations of the country of installation are observed for the monitor.

* For additional information see Bosch Rexroth ctrlX documentation.

Electric information

		NCFL				
Specifications		**10**	**20**	**40**	**80**	**100**
Motor		MC20-100-3L30-N202 -1BPL-NNKT		MC20-130 -3L30-N402 -1BPL-NNKT	MC20-130-3L30 -N502-1BPL-NNKT	
Holding brake*	[V]/[A] [N·m]	24/0.75 8.2		24/1 20.0	24/1 20.0	
Type		please see configurator data sheet				
Servo amplifier	Power element	XC20 -W0023CRN -01BECT0NNNN -SVSRSN2NNNNNNN	XC20 -W0033CRN -01BECT0NNNN -SVSRSN2NNNNNNN	XC20 -W0050CRN -01BECT0NNNN -SVSRSN2NNNNNNN	XC20 -W0055CRN -01BECT0NNNN -SVSRSN2NNNNNNN	
Line filter	[VDC] [W]	HFD 141 / B 2601075		HFD 141 / B 2601076		
Brake resistor		integrated				
Control voltage	[VDC] [W]	24±5% Max.48				
Power connection	[VAC] [HZ] Phases	AC 380...440±10% 50/60±2% 3				
In at Un = 400 V	[A]	6	6	16	16	16

* Holding brake not in warranty scope.

maXYmos NC 5847C

[1] **X16**
Only for external Piezo force sensor.

[2] **X12**
NC joining model（2167）, strain force sensor, the interface for force sensor cable.

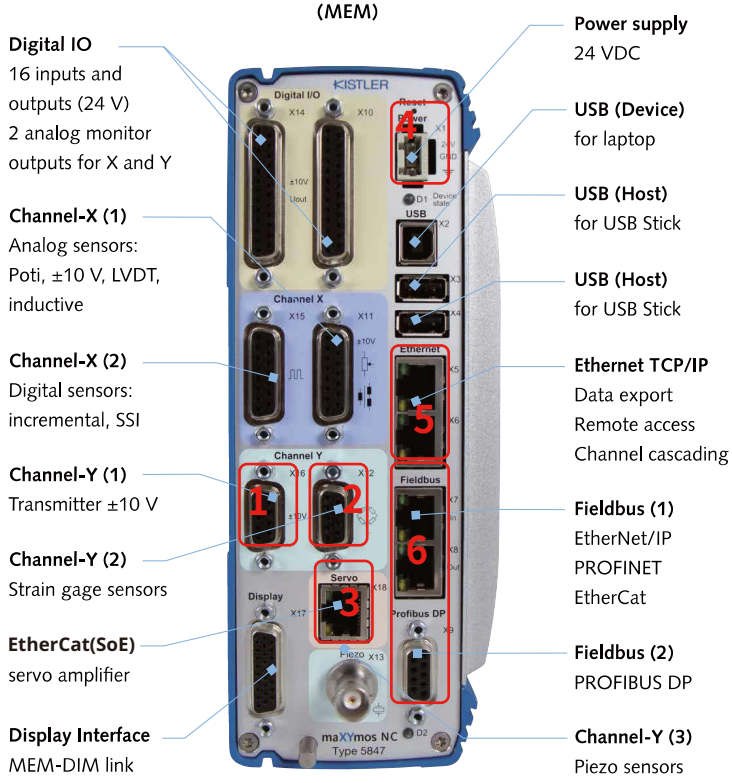
[3] **X18**
EtherCat(SoE), the interface for ctrlX.

[4] NC 24V power supply, PE is necessary.

[5] **X5/X6**
Ethernet TCPIP port, data export, remote with PC, backup and restore.

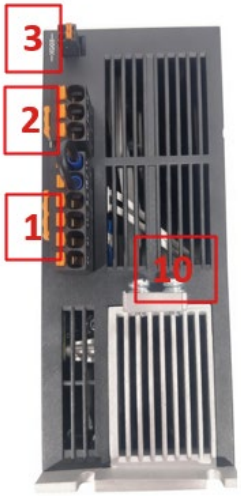
[6] **X7/X8**
Fieldbus for PLC, can selected in maXYmos NC.

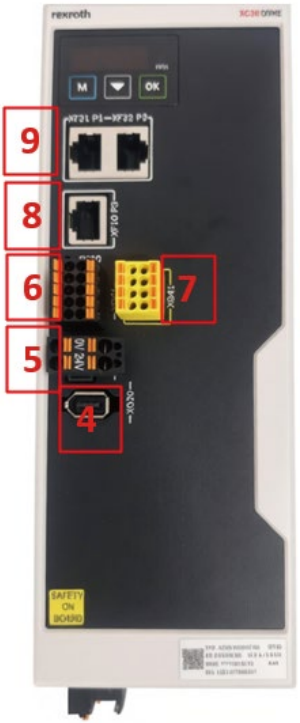
maXYmos NC:
Measuring and evaluation module (MEM)

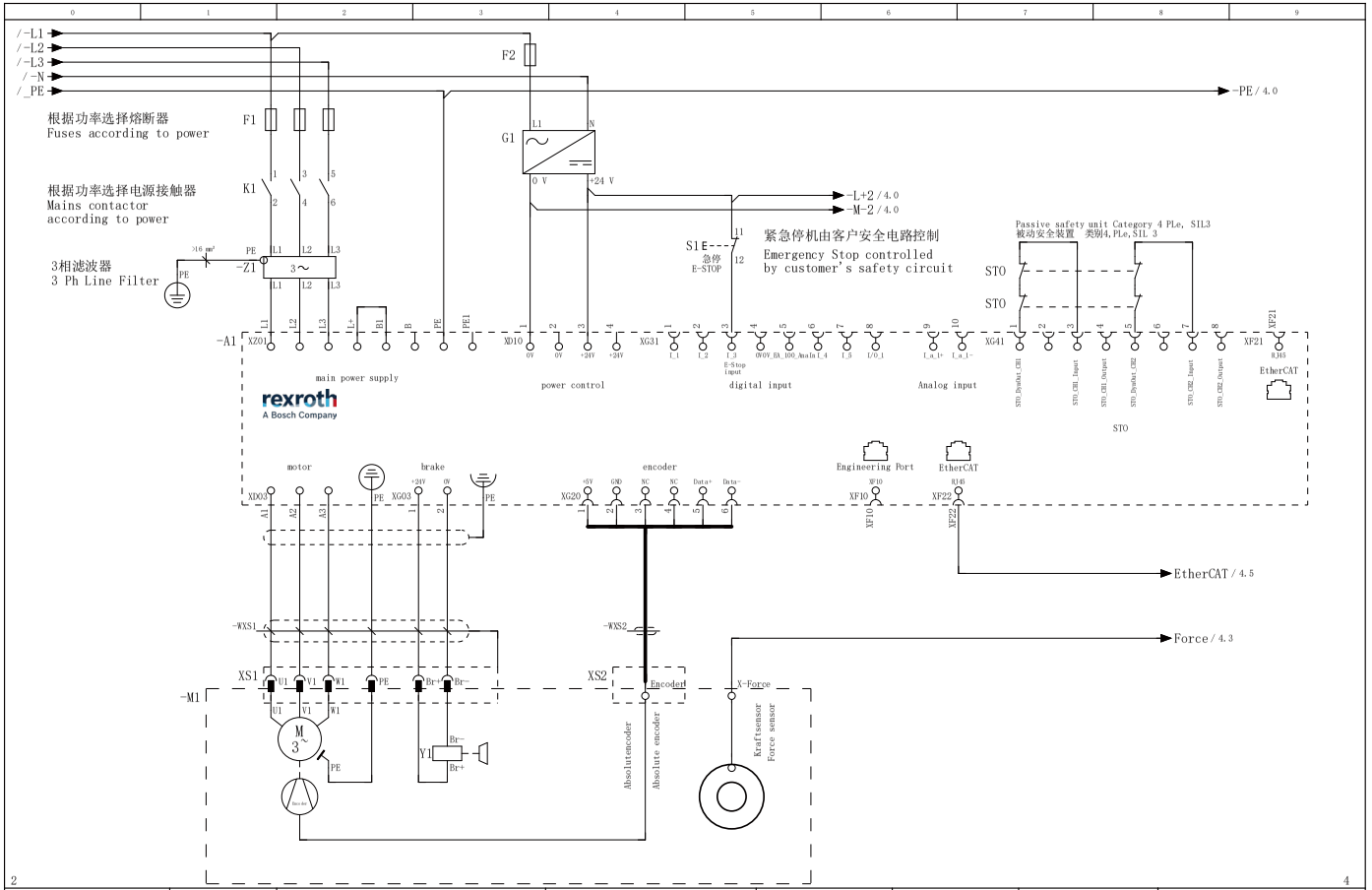


IndraDrive connection

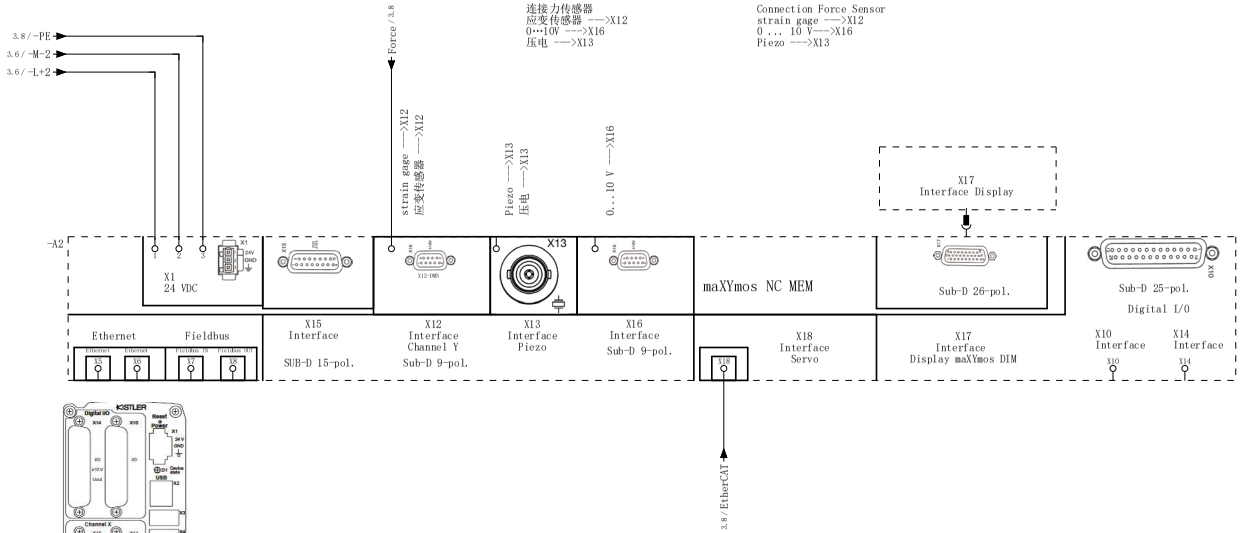
	Description	
1	XZ01：Power supply for driver	
2	XD03：Power cable for motor	
3	XG03：Breaker BR+ BR-	
4	XG20：Encoder cable port	
5	XD10：24V input port	
6	XG31.3： Wired to safety circuit E-STOP	
7	XG41：STO	
8	XF10：Engineer interface	
9	XF21/22：Fieldbus Communication EthereCAT SoE	
10	PE：Housing of IndraDrive must be connected to PE with standard fixture	 

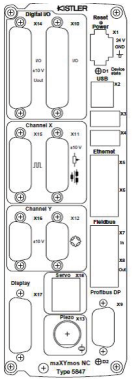






Designer:		maXYmos NC and NCFL	KISTLER measure. analyze. innovate.	Project No	Mounting Location	Page type	Current Page: 3
Verifier:				XC20	= +	&	
Approver:				Cable overview:			Number Of Total Pages: 4
Modification Date:	2026/6/15						





Handbuch / Manual

3

Designer:		maXYmos NC and NCFL	KISTLER measure. analyze. innovate.	Project No	Mounting Location		Page type	Current Page: 4
Verifier:				XC20	=	+	&	
Approver:				Cable overview:				Number Of Total Pages: 4
Modification Date:	2026/6/15							

Power – On/ First switching On Guide

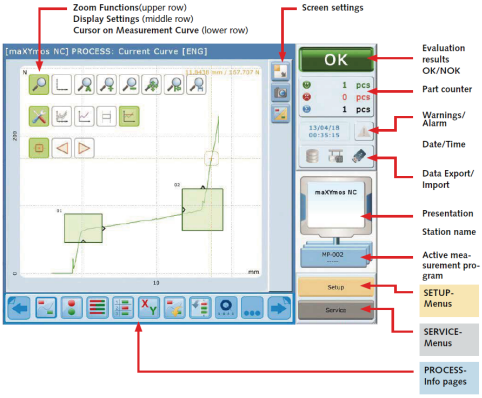
Power - on of the Indradrive Driver

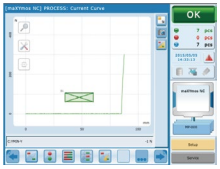
Display	Example	Description/Scope
8.8.8.8.8.	8.8.8.8.8.	Drive is starting
FXXXX	F8060	Error messages
EXXXX	E8022	Warnings
CXXXX	C2101	Diagnostic command messages
AXXXX	A0004	Diagnostic status messages
rSt	rSt	Drive reboot
ОП/СП/РП	ОП	Current drive state (OM, CM, PM)
Uxxx.x	U300.2	DC bus voltage (0.999 9v)
ixxx.x	i005.0	Output current (0-999.9A)
Pxxxx	P5.123	Position deviation, (-9.999-9.999)
P.xxxx	P.5.123	
rXXXX	r3000	Actual speed, (-9999-9999)
r.XXXX	r.3000	
tXXXX	t10.4	Actual torque % (-999.9~999.9)
t.XXXX	t.10.4	
dXXXX	d123/d 1234	Bus IP last section (PN/El) or axisnumber (CE/SE)

Device Status	LED Color/Flashing Mode[1)]	Priority
Fatal error (F8xxx)	RD RD -- -- RD RD -- --	
Communication error (F4xxx)	RD RD RD RD -- -- -- --	
Non-fatal error (F2xxx or F3xxx or travel range error (F6xxx or F7xxx)	RD RD RD RD -- -- -- --	
Wrning (Exxxx)	YE YE YE YE -- -- -- --	
Command or command error (Cxxxx)	RD RD RD RD -- -- -- --	
CM/PM	BU BU BU BU BU BU BU BU	
"Safe torque off" (STO)	YE YE YE YE YE YE YE YE	
bb (drive ready for operation)	GN GN GN GN -- -- -- --	
ZKS (DC bus short circuit)	GN GN GN GN YE YE YE YE	
Ab (drive ready, power on)/ Bb charg	GN GN -- -- GN GN -- --	
AH (Drive Halt)	GN GN GN GN GN GN GN GN	
AF (drive in control) /Lb, LBpower supply section ready	GN GN GN GN GN GN GN GN	

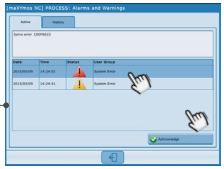
For more faults, please check the online document

The display at a glance

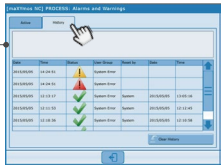




Current warning and error information and reset



Alarm and error history records



General warning for new NC power on.

- Yellow: warning NC model still can move.
- Red: Error, NC model can move after error message cleared.

Common alarm and error for new NC

Alarm message:

- No EO

Reason:

- No evaluation window in current MP

Solutions:

- Setup at least one evaluation window, No EO message can auto reset, detail setting for evaluation window see guidance.
- Spindle can working without evaluation window but the result will always be NOK.

Alarm message:

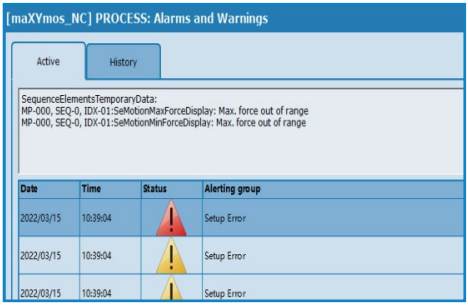
- MAX FOR OUT OF RANGE

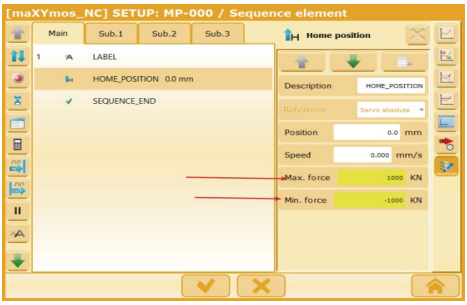
Reason:

- Max force out of range in Home step

Solutions:

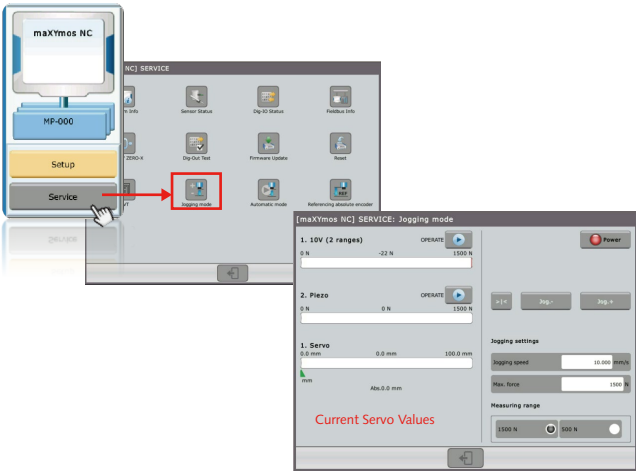
- The alarm happens during NC model first time commissioning, need to reduce the limit force of Home step to safe limit.
- The background color will Switch to yellow when you setup wrong value.
- For example MP000 is program No.0, setup>MP setup> MP000>sequence editor >reduce the Max and min limit force to used range.





Jogging mode and Automatic mode

Jogging mode



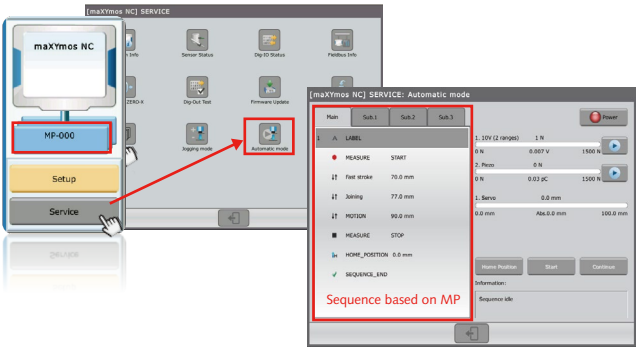
Power: Enable
Gray=IndraDrvie not ready
Red=IndraDrive Ab not Enable
Green=IndraDrive AH, Enabled

>I<:Drive to reference(Setup> Global Setup>NC Setting)

Jog.+: Jogging Positive
Jog.-: Jogging Negative
Jogging speed: Maximum jog speed 10mm/s

Max. force: Maximum force, pressing Jog+ the motor will continue moving even the max force reached

Automatic Mode





Manually start the piezoelectric sensor amplifier to work
*When moving automatically, it will automatically switch to the working mode (the icon is displayed as a square)

Power: Enable

HomePosition: Drive to home position, can be defined in the program
*HomePosition isn't the reference position

Start: Run automatic sequence
*Execute selected program, in this case program 0 is selected
*Will run step-by-step according to the sequence

Continue: Reached HALT can press Continue button to continue the next step

MP setup

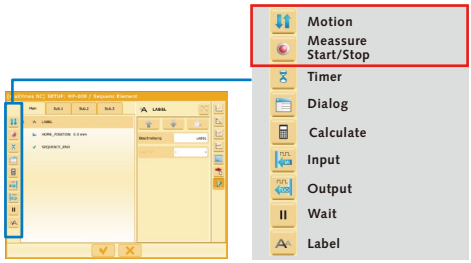
Motion setup

- Please setup sequence before running auto program
- Max 128 programs available in NC
  - Each MPs can setup Separate motion and Sequence editor as the picture show
- ou can findout sequence editor as the picture show



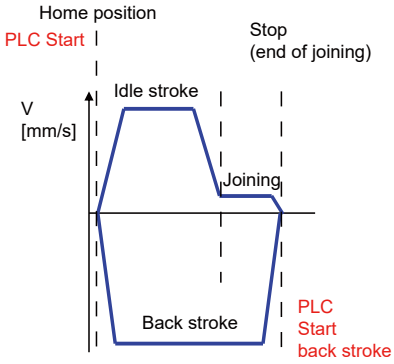
Sequence editor description

- Motion: movement
  - Position, speed, force can be set in motion, normally the press process have two sections (fast speed: Idle stroke, lower speed: Press)
- Measure: Measurement Start/Stop
  - NC only curve the points between measurement Start and measurement Stop, Measurement Stop must be added
- Home: Drive to Home
  - Default setting is 0mm/s, can be set
- Sequence end: Concluding the sequence



Motion setup

- Three sections in normal process
  - Idle stroke, Joining, back stroke
  - Mechanical stop: suggest to use force stop mode
  - No-Mechanical stop: suggest to use position stop mode
- Jogging mode: move spindle to target Idle position and target press position (for example 70mm and 80mm)
- Setup the parameter in sequence editor, see reference below



Target position (mm)	Speed (mm/s)	Stop condition	Maximum protective force (KN)	Explanation
70	10	position	1	Idle stroke
80	2	position	10	Joining
0	10	position	10	Back stroke

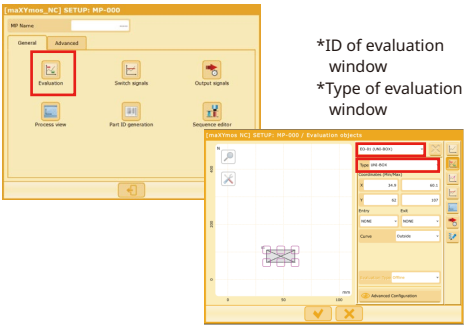
Motion setup

- Add two motions, do not measure Idle stroke
- Insert measure stop before drive to home, do not measure back stroke
- Confirm and save



Motion setup

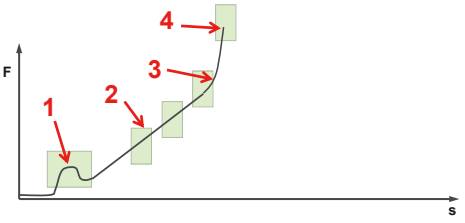
- Evaluation feedback results after pressing finish
- One-Ten evaluation windows available for each MPs
- When the actual curve meets all evaluation windows, maXYmos feedback OK, otherwise NOK

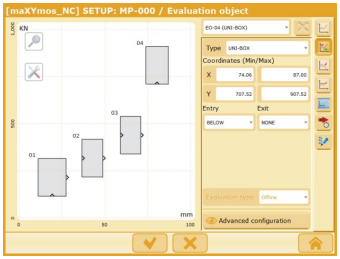


*ID of evaluation window
*Type of evaluation window

Evaluation window setup

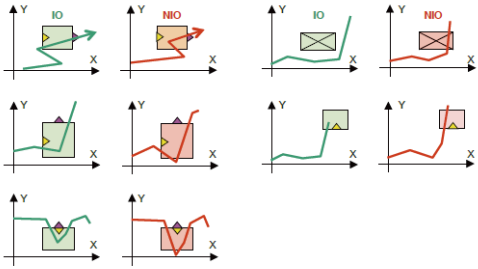
- The curve Evaluation divide into three sections normally, use UNI-BOX at least to checking the final point
- Press point: If the centricity between NC joining system and tooling is not aligned, it will caused the peak force
- UNI-BOX3 select GET-REF to check inflection point force
- UNI-BOX4 to check the pressing end-force /position





Evaluation ctiterion EO UNI-BOX

- UNI-BOX is often used by customer
- The measurement curve must enter once through the specified entry side and exit once through the specified exit side
- Any side can be specified as the entry or exit side. The first point at which the curve crosses a box boundary is the entry event, and its next intersection with a box boundary thereafter is the exit event



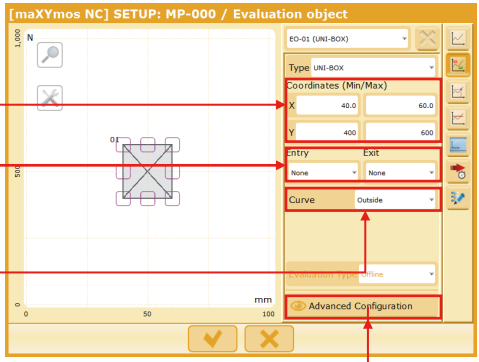
Setup

Coordinates: it can be adjusted manually

Entry/Exit: have None, left, right, below, above, any six options can be chosen

Curve: If the selection Entry is set to "NO" and at the same time the selection Exit to "NO", the additional choice point curve appears. Here, you can choose between "inside" and "outside".For "inside", the curve must begin in the EO and also end within. For "outside", the curve must not touch or cross the EO

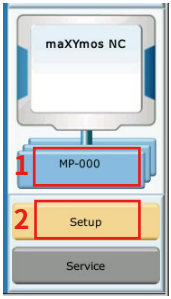
Advanced configuration

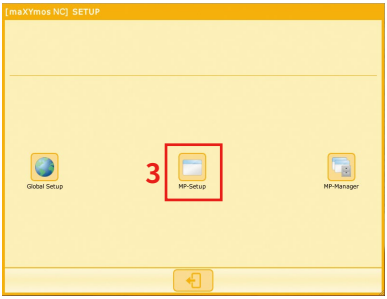


Import Reference Curve

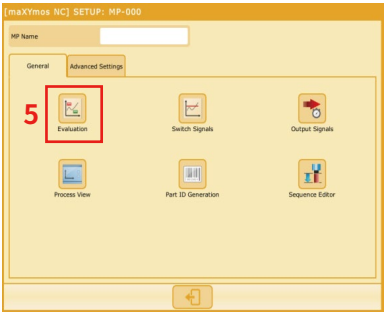
NC allow to import exist curve to help setup

1) Select the MP need to modify
2) Setup
3) MP Setup
4) MP-000
5) Evaluation
6) Curve-Icon
7) Source-History
8) History Record



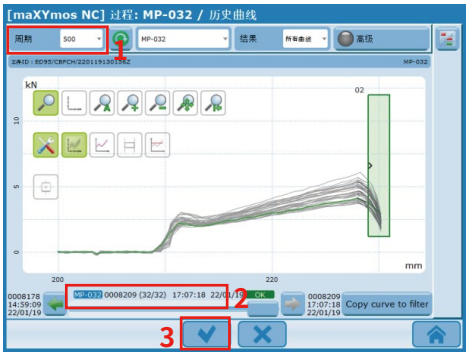


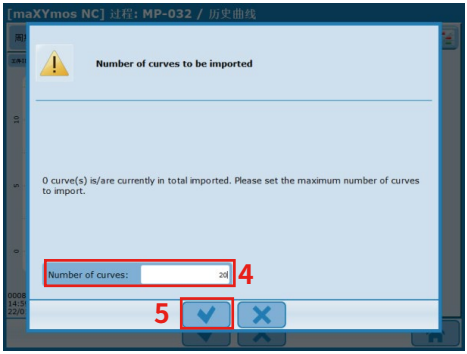


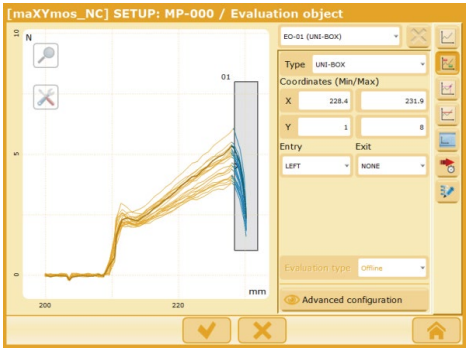




1) Cycles filter
2) Show the number of history curves can be used, Max 20 curves
3) Confirm
4) Confirm the curve number
5) Confirm







PLC Debugging

PLC setup

Hardware Interface

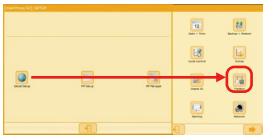
- MaXYmos NC support X7, X8 (RJ45) and X9 (Profibus DP)
- The function of X7 and X8 is same as a Switch, can series connect multiple NC
- It's better to used different IP range between X7, X8 (Fieldbus) and X5, X6 (Ethernet)
- X7, X8 (Fieldbus) not active with New NC, the indicator will not flashing after cable connected
- PLC Configuration

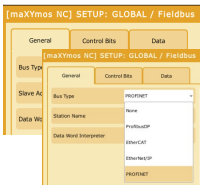
Fieldbus Type

- ProfibusDP
- EtherCAT
- Ethernet/IP
- PROFINET

Control Bits and Data Bits

- 220 bytes, the first 20 bytes are control bits, and the last 200 bytes are data bits
- Control bits are fixed in NC, data bits can be defined manually





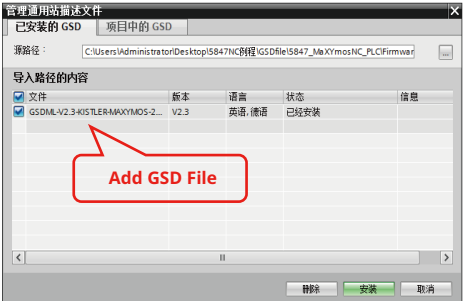


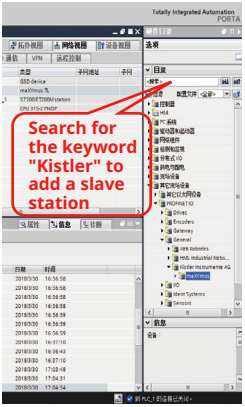
PLC Configuration

Example for Siemens PLC

- Add GSD file
- Insert Slave station
- Assign Name and IP address
- After download the configuration, BUS-connection success show as the picture









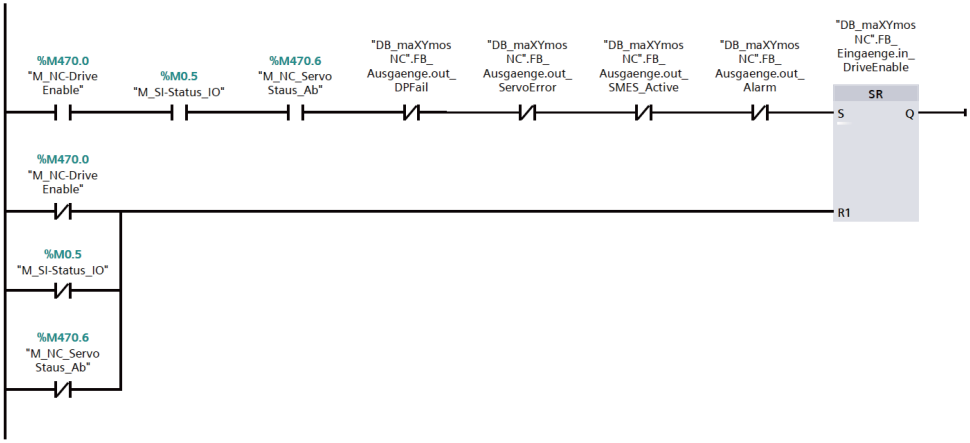
PLC Logic - Drive Enable

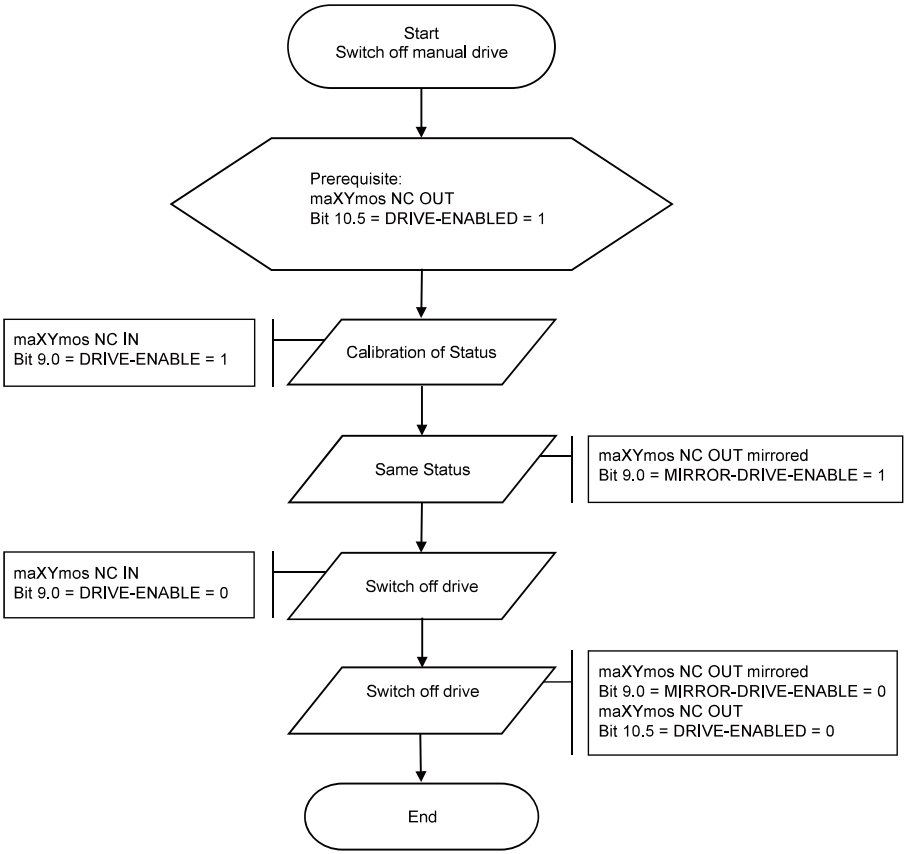
Drive Enable

- Enable the motor is the condition of motion, after drive enable success driver will show AH
- Holding brake will be released after drive Enable success

Pre - conditions

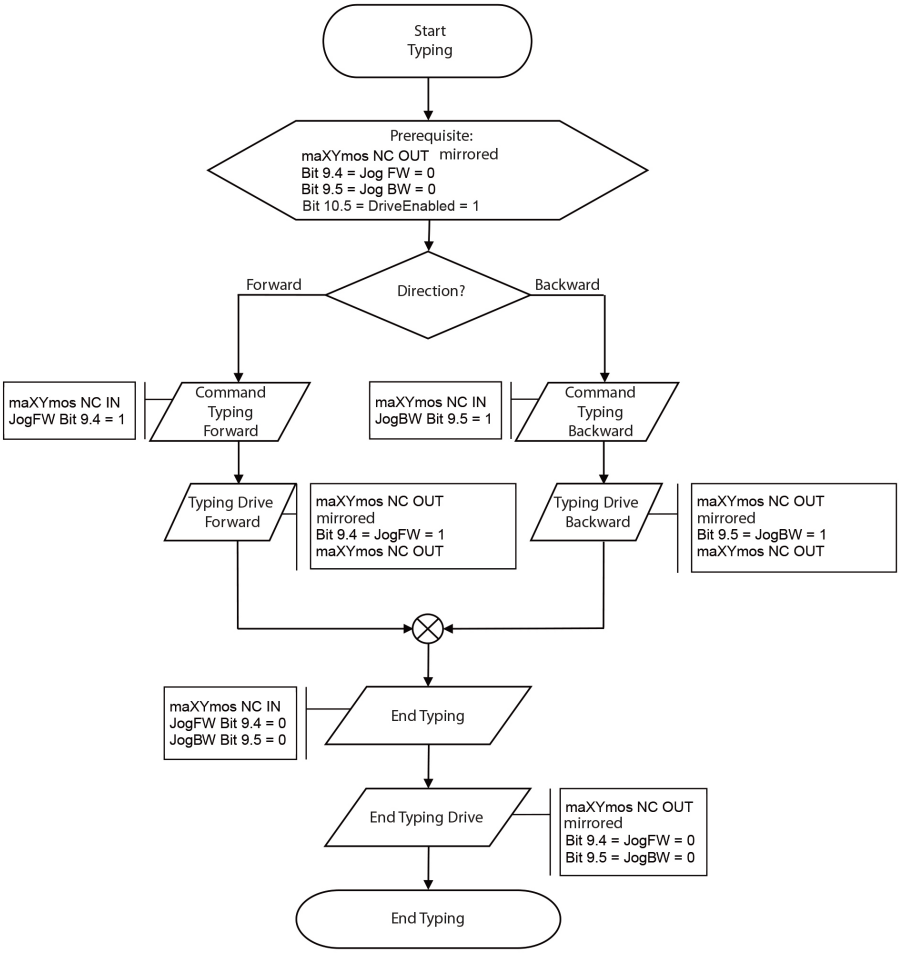
- Safety circuit not active. Safety Status IO
- Servo Diagnosis =Ab (Drive ready)
- No Fieldbus fault
- No Servo fault
- No alarm on maXYmos NC




Start
Switch off manual drive
Prerequisite:
maXYmos NC OUT
Bit 10.5 = DRIVE-ENABLED = 1
maXYmos NC IN
Bit 9.0 = DRIVE-ENABLE = 1
Calibration of Status
Same Status
maXYmos NC OUT mirrored
Bit 9.0 = MIRROR-DRIVE-ENABLE = 1
maXYmos NC IN
Bit 9.0 = DRIVE-ENABLE = 0
Switch off drive
Switch off drive
maXYmos NC OUT mirrored
Bit 9.0 = MIRROR-DRIVE-ENABLE = 0
maXYmos NC OUT
Bit 10.5 = DRIVE-ENABLED = 0
End

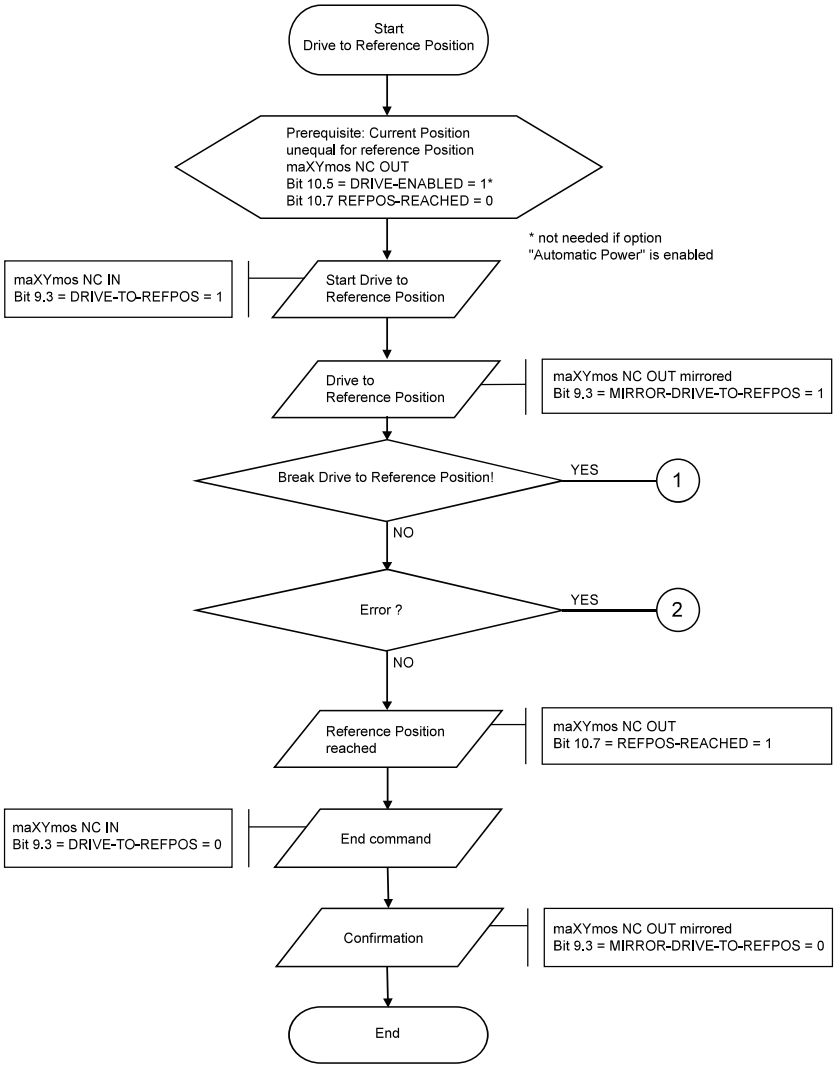
PLC Logic - Jog

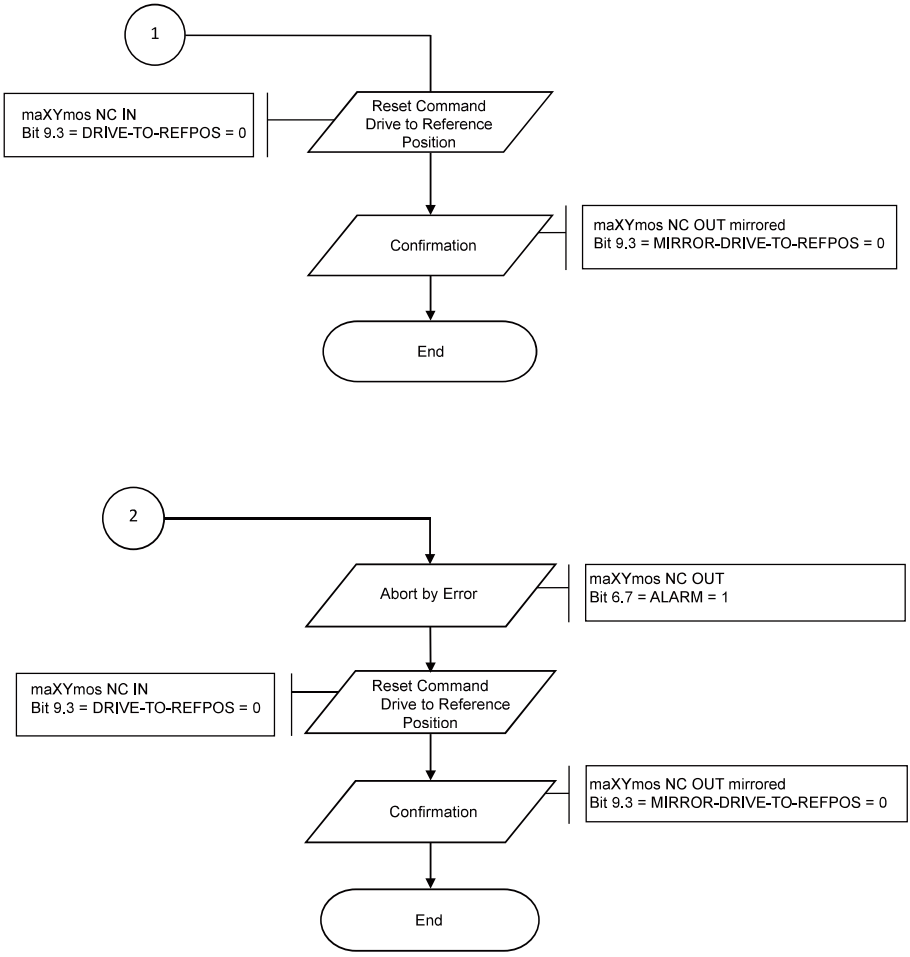
- Jog Mode
- No need to select the motion mode
- Default Jog speed is 10mm/s, the limit force is the Max force, it can be written by PLC via telegram
- After Jogging, it is not allow to start the Auto process directly, drive to Home or drive to reference needed before Auto running



PLC Logic - Drive to reference 0mm

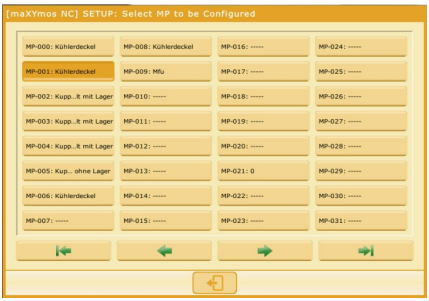
- Default reference value is 0mm, it can be modified by maXYmos or PLC
- Default speed of drive to reference is 10mm/s, can be modified by maXYmos or PLC

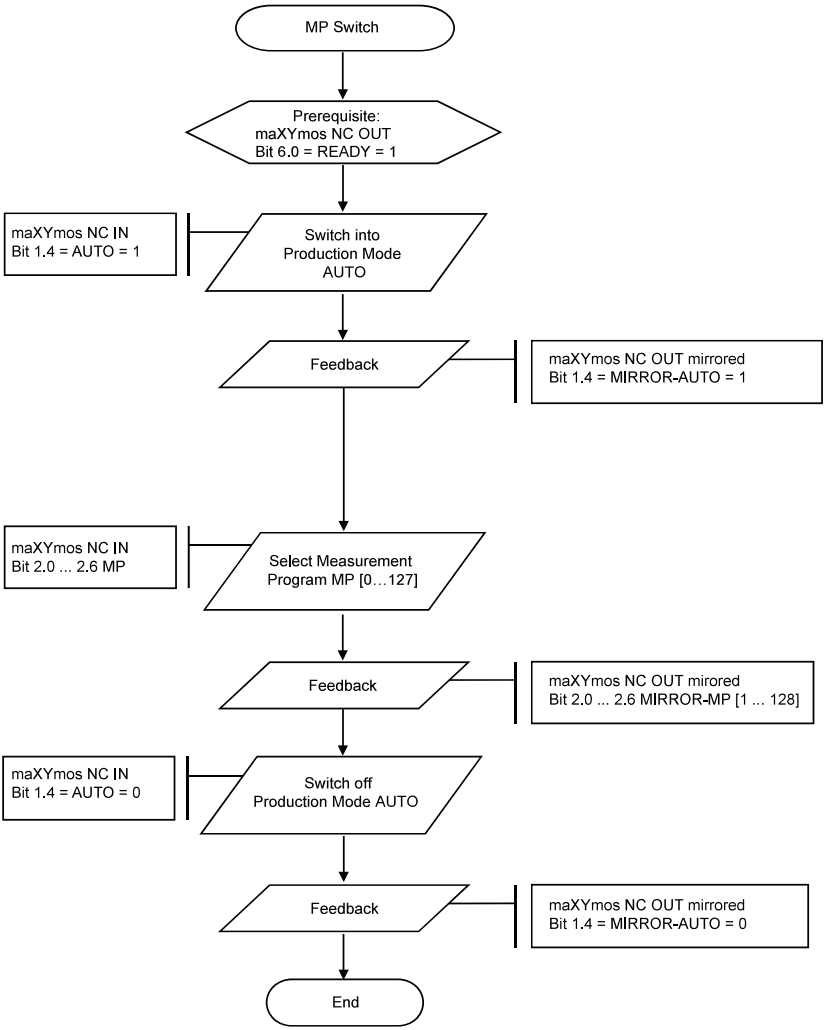



1
maXYmos NC IN
Bit 9.3 = DRIVE-TO-REFPOS = 0
Reset Command
Drive to Reference
Position
Confirmation
maXYmos NC OUT mirrored
Bit 9.3 = MIRROR-DRIVE-TO-REFPOS = 0
End
2
Abort by Error
maXYmos NC OUT
Bit 6.7 = ALARM = 1
maXYmos NC IN
Bit 9.3 = DRIVE-TO-REFPOS = 0
Reset Command
Drive to Reference
Position
Confirmation
maXYmos NC OUT mirrored
Bit 9.3 = MIRROR-DRIVE-TO-REFPOS = 0
End

PLC Logic - Auto - MP selection

- Need to Confirm current MP before Auto running
- After AUTO (Bit1.4) is set to 1, the current MP will be written by PLC input (Byte2)

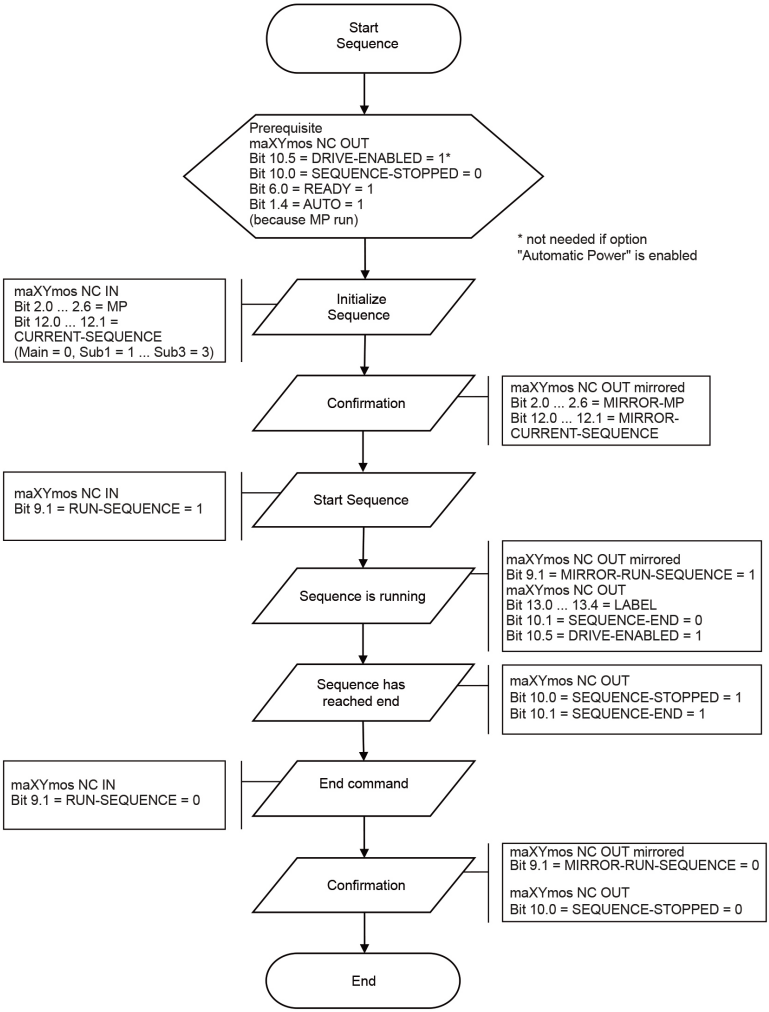




PLC Logic - Auto - MP selection

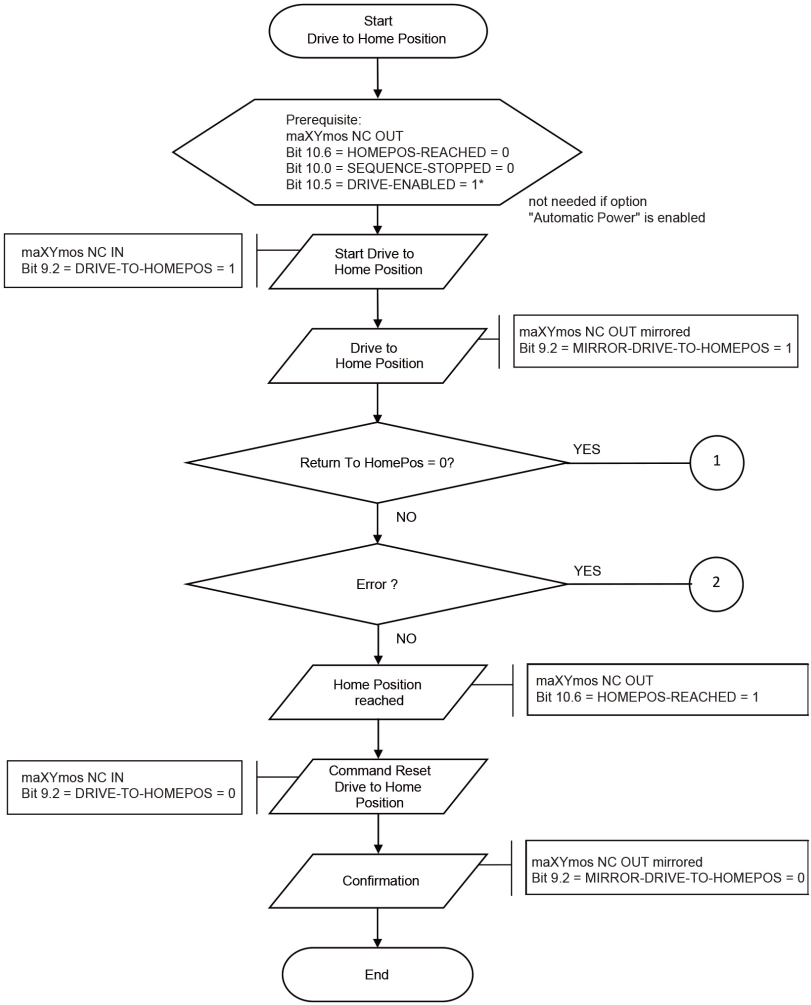
- After Bit5.1 receive the rising edge and remain the Bit5.1 to 1, Auto Start will active
- PLC only control sequence start and stop, detail parameter can be setup in sequence editor
- Result OK/NOK will be given when measure start/stop in sequence

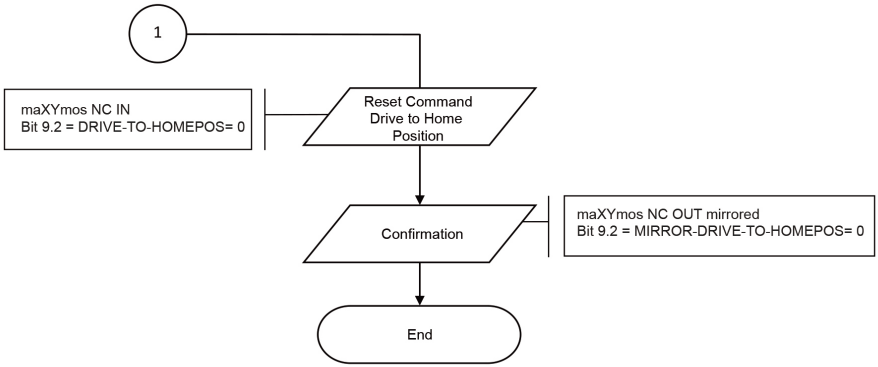


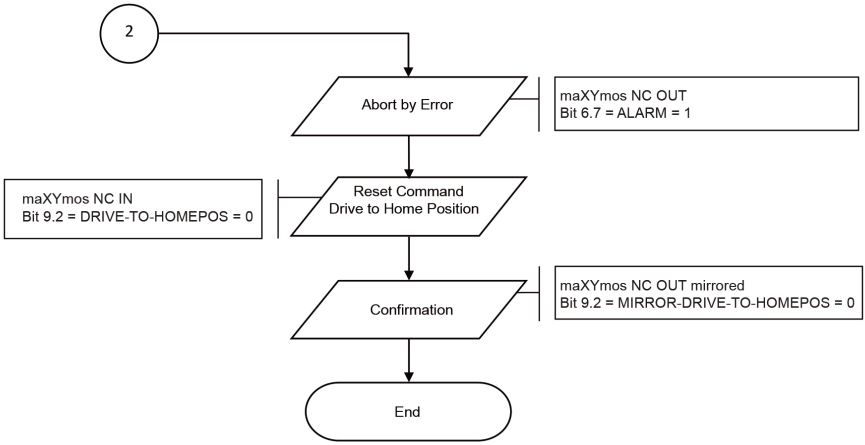


PLC Logic - Auto - Drive to Home

- Driving to home position is specific to the MP and can be manually performed in the menu service>Sequence Mode, also can be executed via PLC input



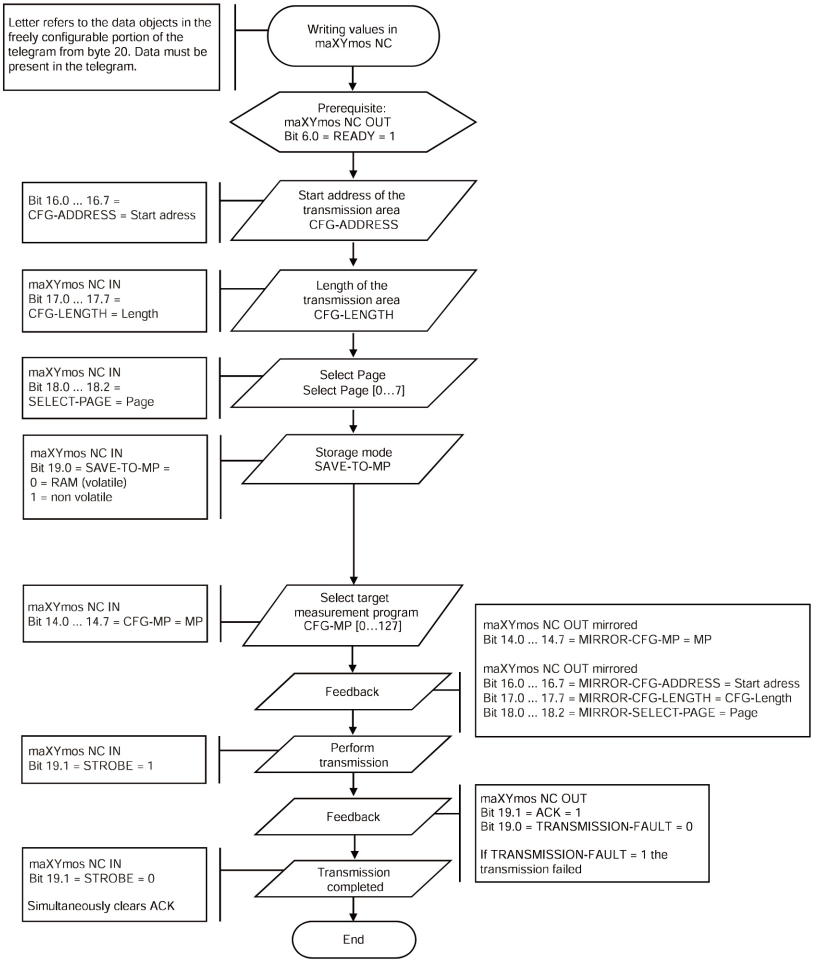

1
maXYmos NC IN
Bit 9.2 = DRIVE-TO-HOMEPOS= 0
Reset Command
Drive to Home
Position
Confirmation
maXYmos NC OUT mirrored
Bit 9.2 = MIRROR-DRIVE-TO-HOMEPOS= 0
End


2
Abort by Error
maXYmos NC OUT
Bit 6.7 = ALARM = 1
maXYmos NC IN
Bit 9.2 = DRIVE-TO-HOMEPOS = 0
Reset Command
Drive to Home Position
Confirmation
maXYmos NC OUT mirrored
Bit 9.2 = MIRROR-DRIVE-TO-HOMEPOS = 0
End

PLC Logic - Transfer value to maXYmos

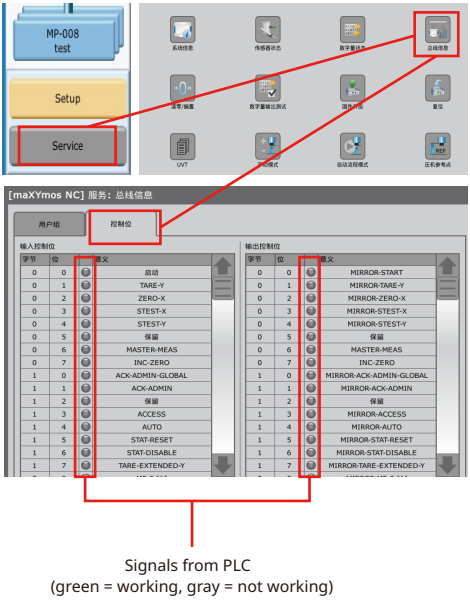


- For example, transfer Barcode to maXYmos (see the picture address configuration below)
- PLC need to prepare the value before send to correct address
  - Byte24-Byte43: 20 Bytes, less then 20 bytes also available
- Byte12 of PLC output is current program number
- The beginning of address ,Byte16=4(24-20=4)
- Length, Byte17=20
- Set Bit19.1 =1 and feedback Bit19.1=1 means write success



PLC Logic

- Display the status of the respective bits (green = 1, gray = 0)
- If the device does not execute according to the PLC signal, the signal status can be checked in this interface



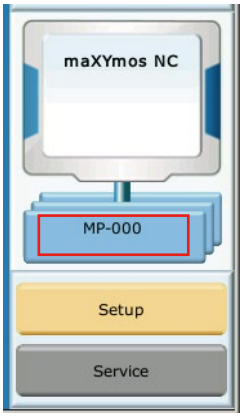
Signals from PLC
(green = working, gray = not working)

Backup - USB stick

- Suggest to backup after setup the parameter
- Only USB stick (FAT32) can be connected successfully
- NC can not be locked before backup (Bit1.4 =0, no protection access)



USB stick ready



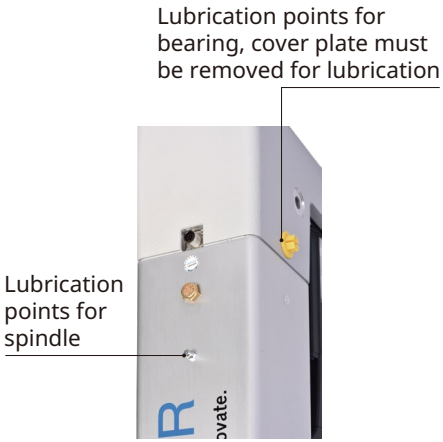


Maintenance

Maintenance tasks

- **Force sensor calibration**
  - Not mandatory, but recommended to be calibrated once a year
- **Data backup**
  - Need to backup after each parameter modification
  - After enabling the data export function, automatic backup can be triggered by PLC
- **X-Reference Setup**
  - The X-Reference must be setup again after the Indradrive replaced or parameter changed
  - Incorrect reference point setting can damage mechanical components
- **Mechanical part**
  - Regularly check the torque of screws
  - Regularly lubricate bearings and spindle

Regular lubrication is necessary



Model 2167B..., NCFL (Mechanical part)

Lubrication must be performed every 350,000 strokes or at least once a year. Only the Klüberplex BEM 41-132 can be used.

Bearing lubrication

NCFL model	Number of filling ports	Amount of grease to be filled per port (g)
10/20 kN	1x	1.5
40 kN	2x	1.5
80 kN	2x	8.5
100 kN	1x	8.5

Spindle lubrication (Please ensure that the pressure head is at the 0 position)

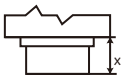
NCFL model	Amount of grease to be filled per port (g)
10/20 kN	1.5
40 kN	4
80 kN	12
100 kN	12

CAUTION

Note:
Please be sure to lubricate every 350,000 strokes or at least once a year;
Wrong lubrication or no lubrication will lost warranty. If the servo press system operates with short strokes, a lubrication stroke greater than the short stroke should be performed every 10,000 double strokes.

NOTE

Note:
Before lubrication, the pressure head extension length X= 50 mm



Kistler China
Building 15, No.1588 Shenchang Road, 201107,
Shanghai, China
Tel. +86 21 23516000
marketing.cn@kistler.com

Find your local contact on
www.kistler.com.cn

KISTLER
measure. analyze. innovate.