LNC-IN2000 Toggle Controller

Operator's Manual

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Leading Numerical Controller

LNC Technology Co., Ltd.

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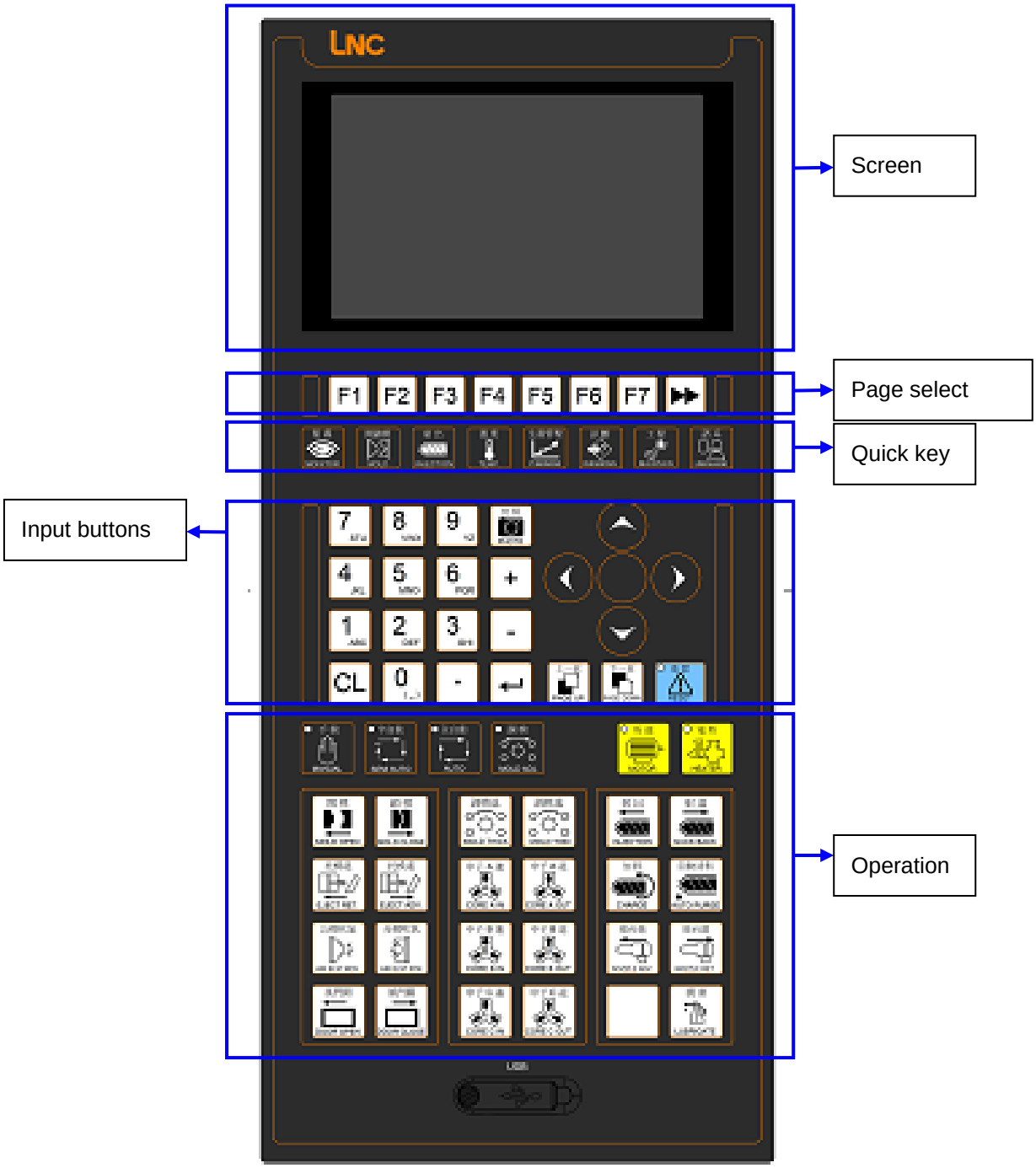
1 PREFACE

This Operator's Manual of LNC-IN series describes the steps of setting injection molding data or values on the screen via the operation panel. By following the instruction in this manual, users can make the best use of the sophisticated functions of horizontal injection molding machine numerical operation panel.

2 LAYOUT

2.1 LAYOUT(All in one)



2.2 BUTTON

Page Selection

F1 ~ F7	Corresponding to the page or the function on the screen.
▶▶	Go to the next page.

Quick Key

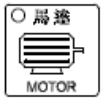
	Go to monitor group
	Go to mold group
	Go to injection group
	Go to temperature group
	Go to production manager group
	Go to diagnosis group
	Go tomaintain group
語系	Go to language

Input

1 ABC	Input the number 1 & letters A, B, & C.
2 DEF	Input the number 2 & letters D, E, & F.
3 GHI	Input the number 3 & letters G, H, & I.
4 JKL	Input the number 4 & letters J, K, & L.
5 MNO	Input the number 5 & letters M, N, & O.

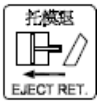
	Input the number 6 & letters P, Q, & R.
	Input the number 7 & letters S, T, & U.
	Input the number 8 & letters V, W, & X.
	Input the number 9 & letters Y, & Z.
	Input the number 0 & symbol (、_ 、).
	Input decimal numbers.
	Clear.
	Page up.
	Page down.
	Plus by the least digit.
	Deduct by the least digit.
	Save this print screen page to save to USB.
	After some value is input, press the Enter key to save that value.
	Cursor left.
	Cursor right.
	Cursor down.
	Cursor up.
	Press this button to reset.

Function

	The upper-left corner light turns on when the motor is activated.
	The upper-left corner light turns on when the heater is activated.
	To process mold adjustment programs or to set related parameters of mold thickness, clamping force, pressure, speed, etc.
	To switch to automatic control mode.
	To switch to manual control mode.
	To switch to semi-automatic mode.

Operation

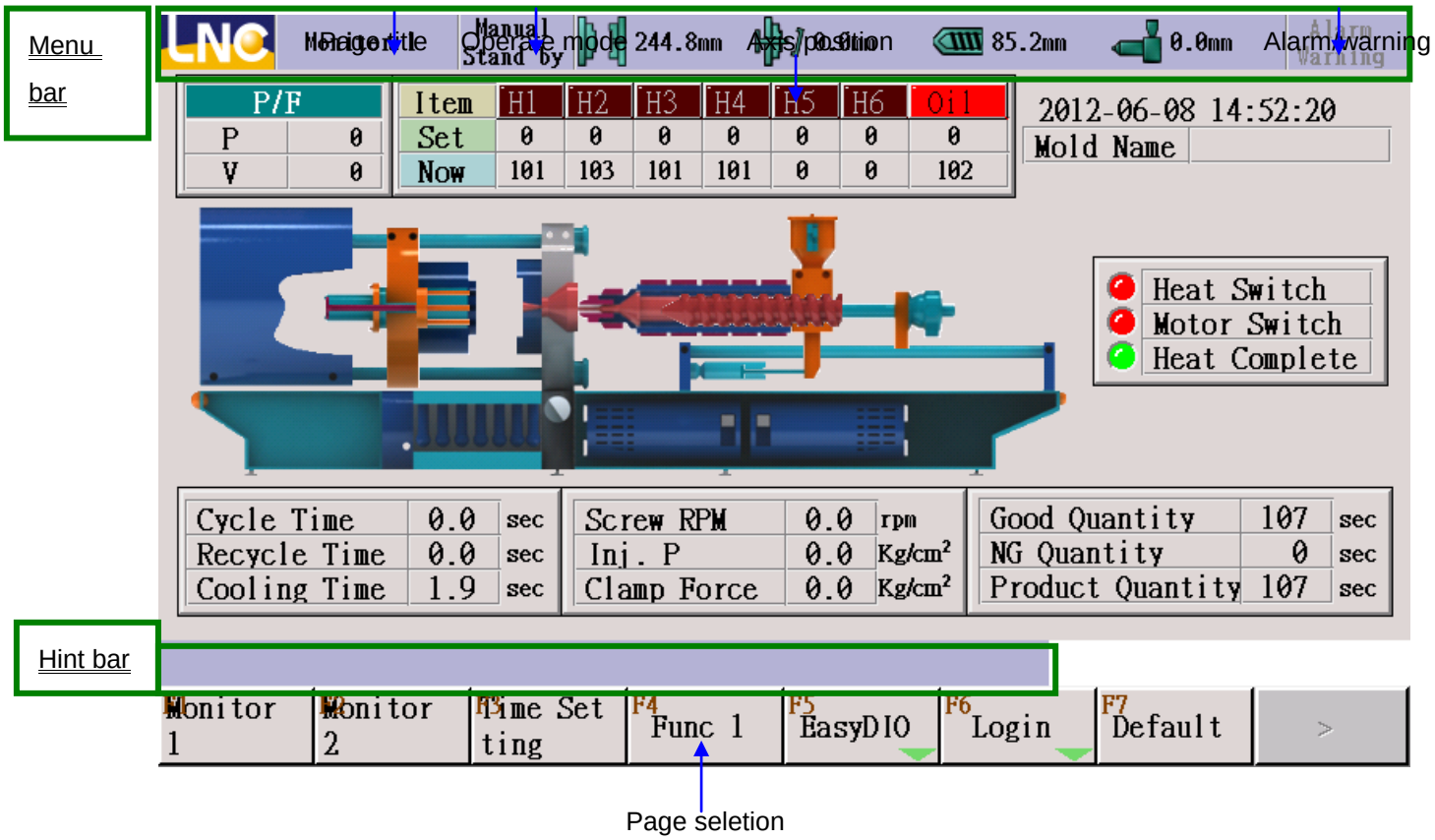
	When barrel temperature has reached the set value, and the preheat time is reached, press this key to inject the material. During injection operation, the barrel enters each holding pressure phase according to settings, and reaches the pressure & speed set by the last phase of holding pressure operation.
	Suckback operation shares the same execution condition as injection operation. When injection position is at the final ending position before executing suck back operation, press this button, and the screw that has executed injection will start suck back operation and retreats to the original position.
	To move the nozzle forward.
	To retract the nozzle.
	To clean barrel residue, press this button, and automatic purge operation is executed according to the settings of purging times and plasticizing charging time.
	When the injection position is right before the completion of plasticizing, press this button to feed the material into the barrel.
	Press this to turn on lubrication motor to start lubrication.
	Press this button to control core A or forward.
	Press this button to control core A or backward.

	Press this button to control core B or forward.
	Press this button to control core B or backward.
	Press this button to control core C or forward.
	Press this button to control core C or backward.
	To adjust mold position by moving it backward.
	To adjust mold position by moving it forward.
	Turn on air blow valve of fixed plate.
	Turn on air blow valve of move plate.
	Mold close
	Mold open.
	Press this button to let eject advanced
	Press this button to let eject rejected.

	To open the door.
	To close the door.

3 LCD MONITOR

3.1 Screen Layout



- Page has Menu、page content & hint bar
- Menu has：

  Page title：The title of the current page.

  Operate mode：Current operating mode, including JOG, Mold adjust, Manual, Semi-automatic, and Automatic mode.

  Axis position：Shows the positions of each axis during clamping, ejection, injection, and injection unit (must be equipped with a position detector).

  Alarm/warning：When there is a warning or an alarm, the background of warning/alarm area will turn to red to remind users to perform troubleshooting.

- Hint bar：

  Input hint：Hints of the purpose and legal range of the input value.

  Input text box：Enter the set value in this box.

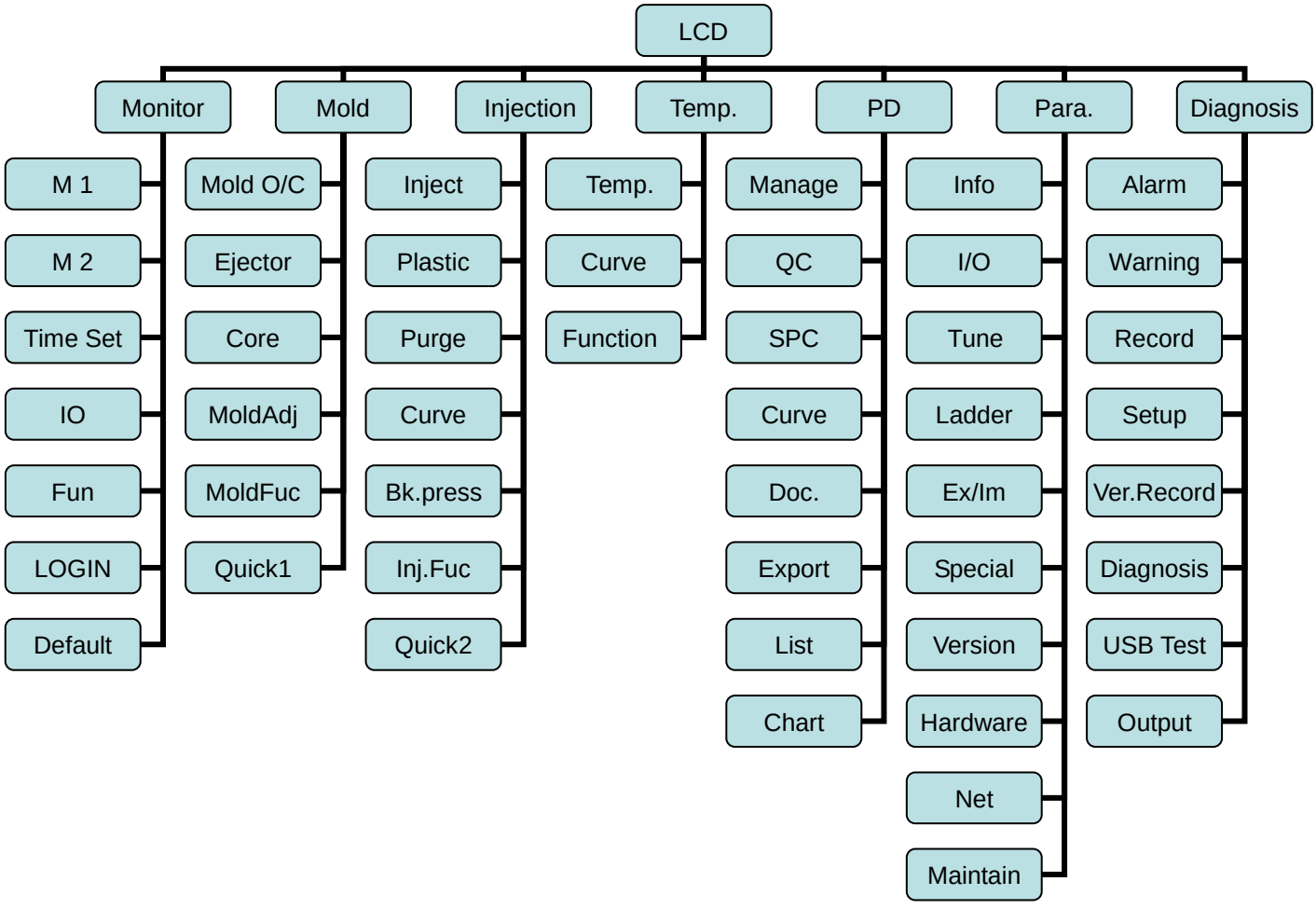
  Page selection：Use the page buttons at the bottom of the screen to switch

between pages. For the operating method, please refer to Chapter 4.

3.2 Operating Pages

The operating pages of LNC-IN injection molding machine controller are classified by hierarchical clustering, which means the pages with similar functions are clustered into the same group for ease of setup. Users can use F1-F7 functions to do quick change between groups or use ▶▶ to go to next layer.

LNC-IN groups are as below.



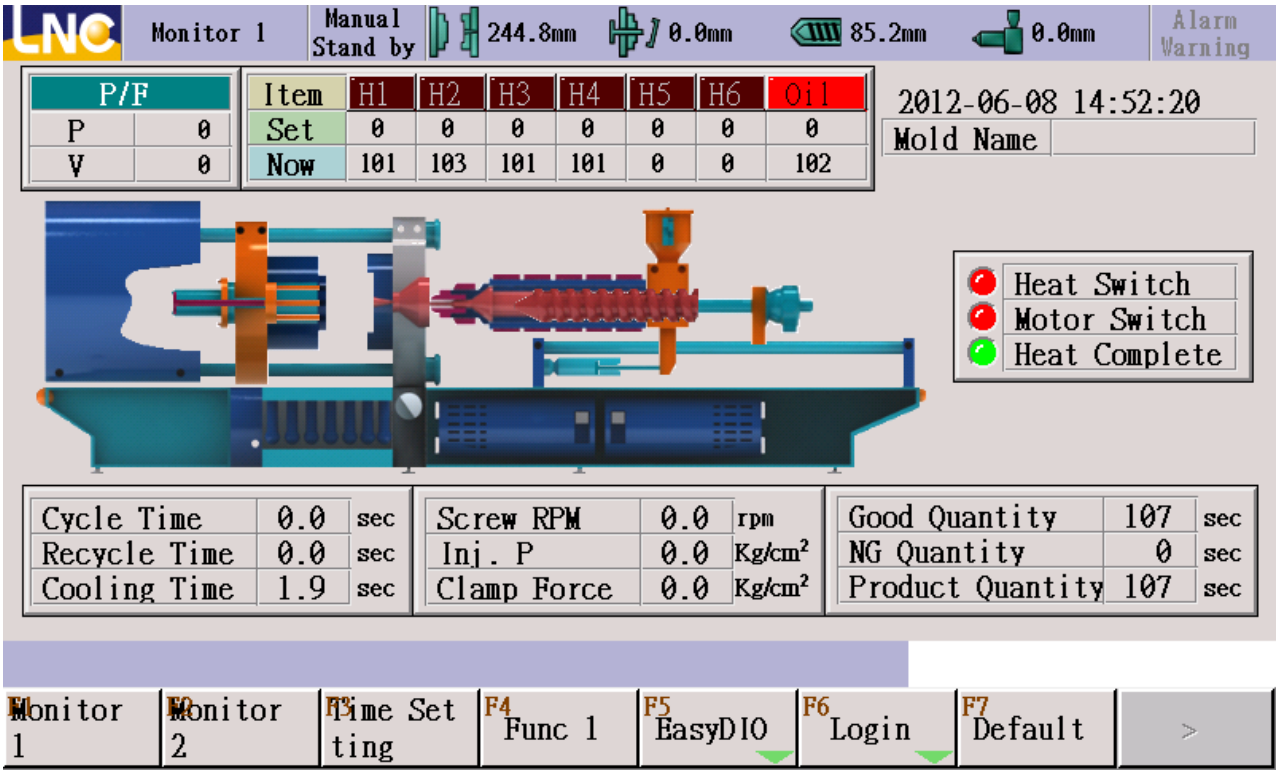
After booting, go to monitor, users can use F1-F7 to go to every group.

4 PAGE FUNCTIONS

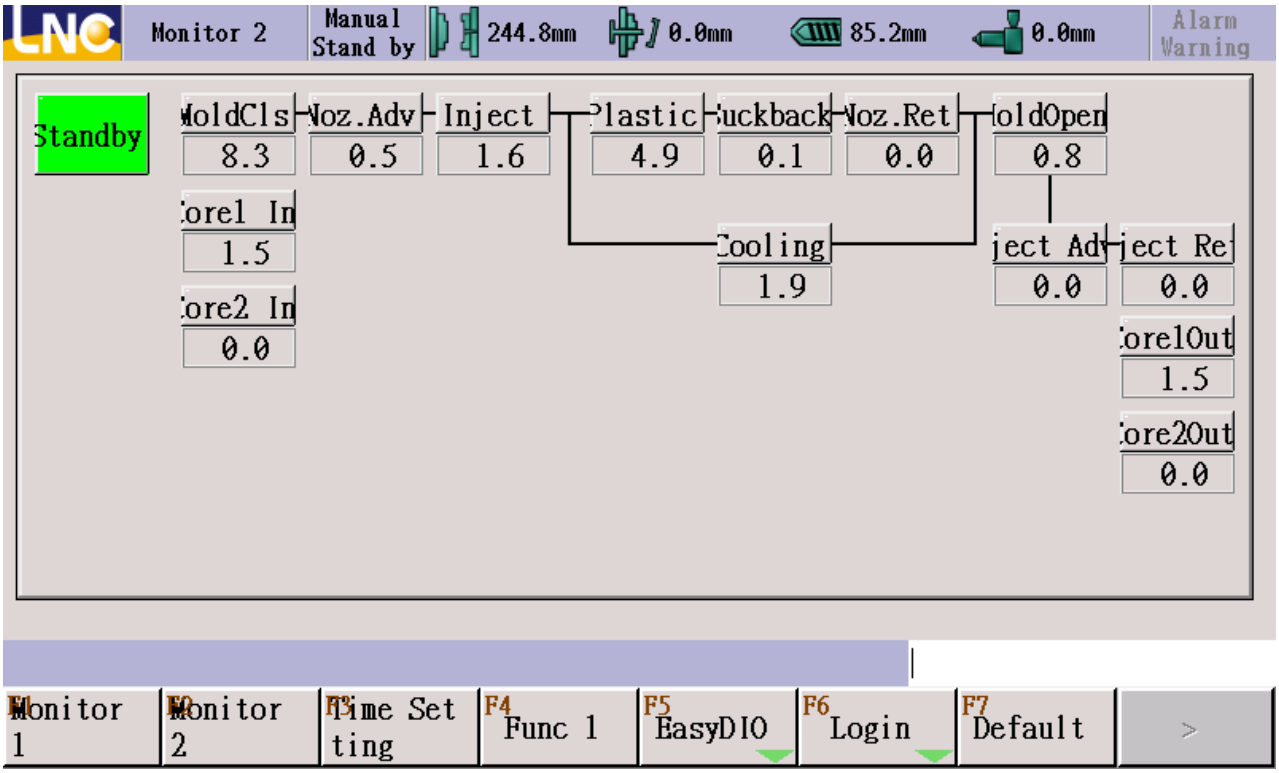
4.1 Monitor

【Monitor 1】

This is to monitor machine status when running.



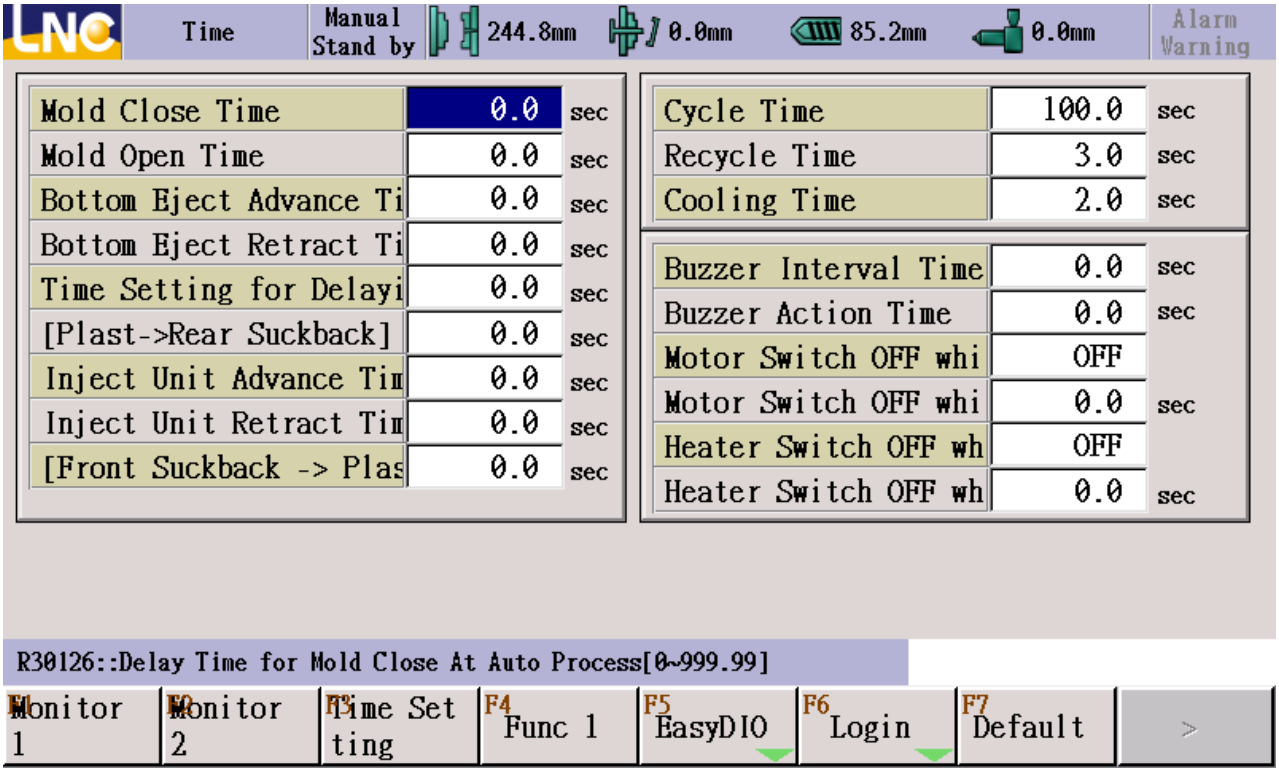
【Monitor 2】



This page enables users to monitor the operations of standby, close mold, unit forward, injection, plasticizing, suckback, open mold, eject forward, eject backward, etc. Users can understand every part's time.

【Time】

This is to set up delay time and alarm time in auto mode.



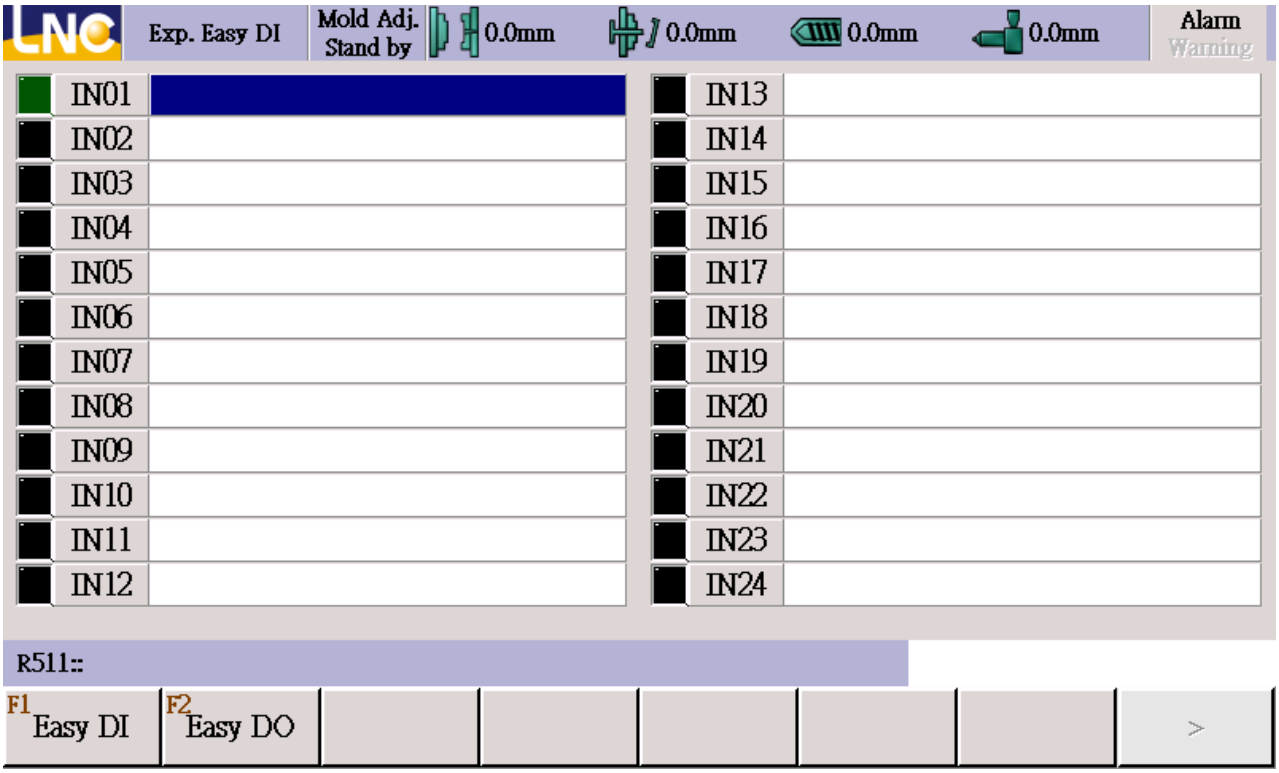
- Cycle Time：Maximum production time under auto/semi-auto. When exact production time is over this setting value, controller will send alarm. After this setting value, there will be current production cycle time and previous one.
- Recycle Time：Interval time between two cycle times, set up according to exact situation.
- Cooling Time：Start timing after complete injection holding pressure, when cooling time arrives setting value, open mold.
- Buzzer Interval Time：Starts timing when system sends alarm. If the time arrives, stops buzz, then repeats this until the setting time arrives.
- Buzzer Action Time：Start timing after alarm, when time arrives, stop.
- Close Mold Delay Time：Set up delay time before close mold under auto/semi-auto.
- Nozzle Forward Delay Time：Set up delay time before nozzle forward under auto/semi-auto.
- Injection Delay Time：Delay time between nozzle forward complete to injection starts under auto/semi-auto.
- Front Suckback Delay Time：Delay time between injection complete to front suckback starts under auto/semi-auto.
- Eject Forward Delay Time：Delay time between open mold complete to eject

forward starts under auto/semi-auto.

- Eject Backward Delay Time：Delay time between eject forward complete to eject backward starts under auto/semi-auto.
- Plasticizing Delay Time：Delay time between injection and holding pressure complete to plasticizing starts under auto/semi-auto.
- Back Suckback Delay Time：Delay time between plasticizing complete to back suckback starts under auto/semi-auto.
- Nozzle Backward Delay Time：Set up delay time before nozzle backward under auto/semi-auto.
- Open Mold Delay Time：Set up delay time before open mold under auto/semi-auto.
- Alarm to Cut Heater Switch Selection：If this is ON, when alarm happens, users didn’t press reset button to clear this alarm, then system will cut the heater switch off to prevent damage.
- Alarm to Cut Heater：The total time since the alarm starts until the system break the heater power.
- Alarm to Cut Motor Switch Selection：If this is ON, when alarm happens, users didn’t press reset button to clear this alarm, then system will cut the motor power off to prevent damage.
- Alarm to Cut Motor Time：The total time since the alarm starts until the system break the motor power.

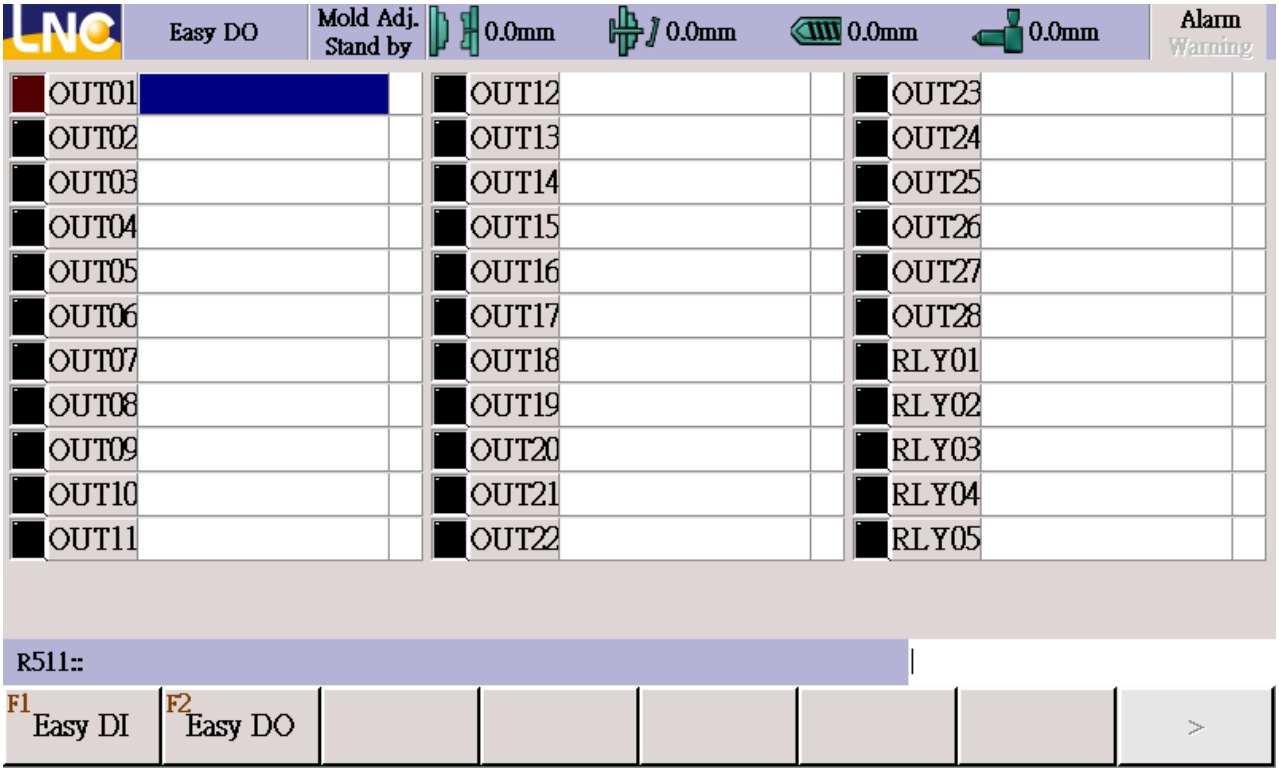
【Easy DI】

This page is to check if the input signal is normal, for machine makers and end-users to do troubleshooting.



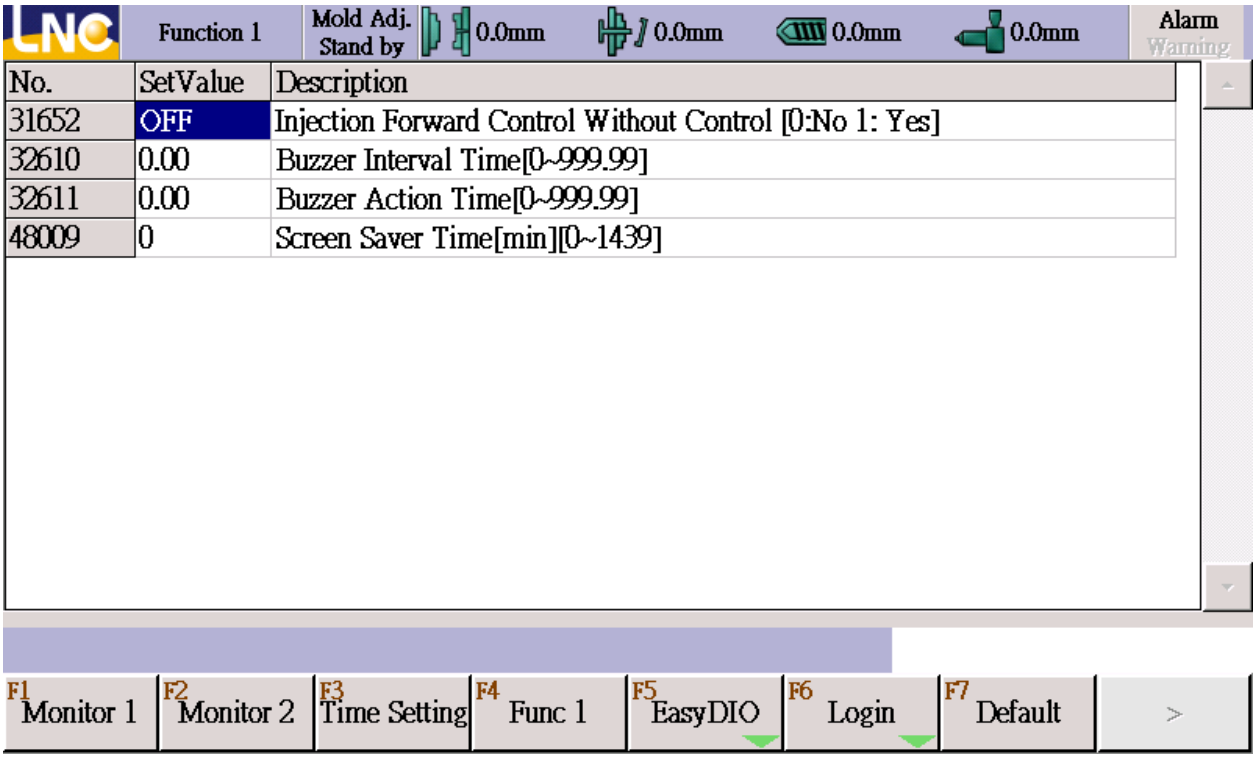
【Easy DO】

This page is to check if the output signal is normal.



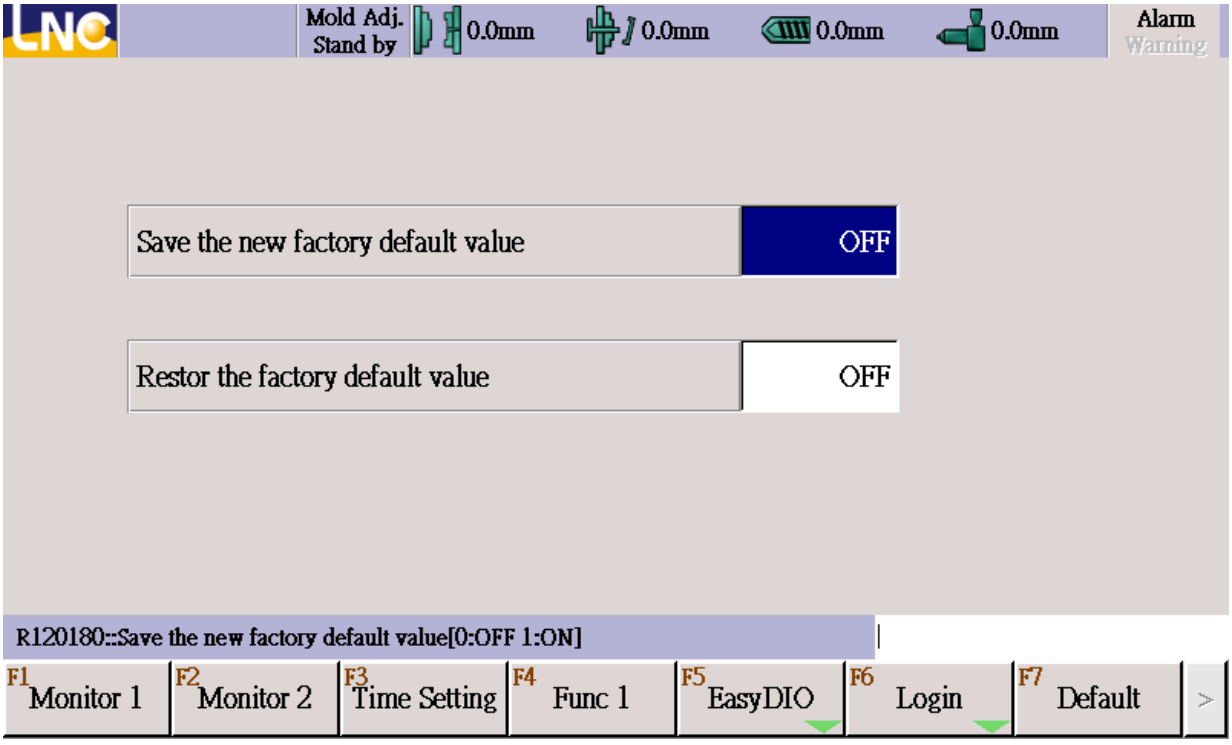
【Function 1】

This list is for machine maker to list out functions for end-users, default only monitor protection time.



【Default】

If machine maker completed all testing, machine maker can save this value to be default. If end-user has any problem, he can return it to default.



【Password】

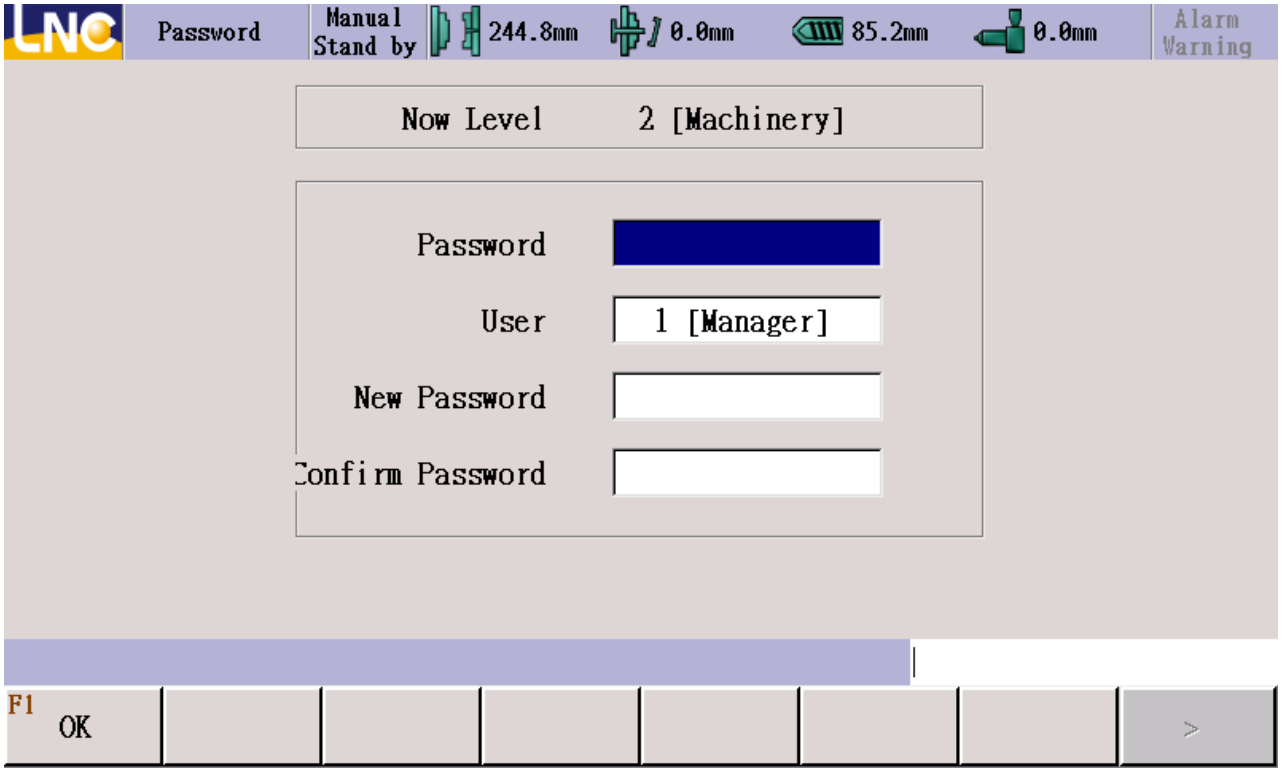
There are 4 types of level, display will be different according to different level.

0 [Operator]：Production operator

1 [Manager]：Production manager

2 [Machine maker]：Machine maker

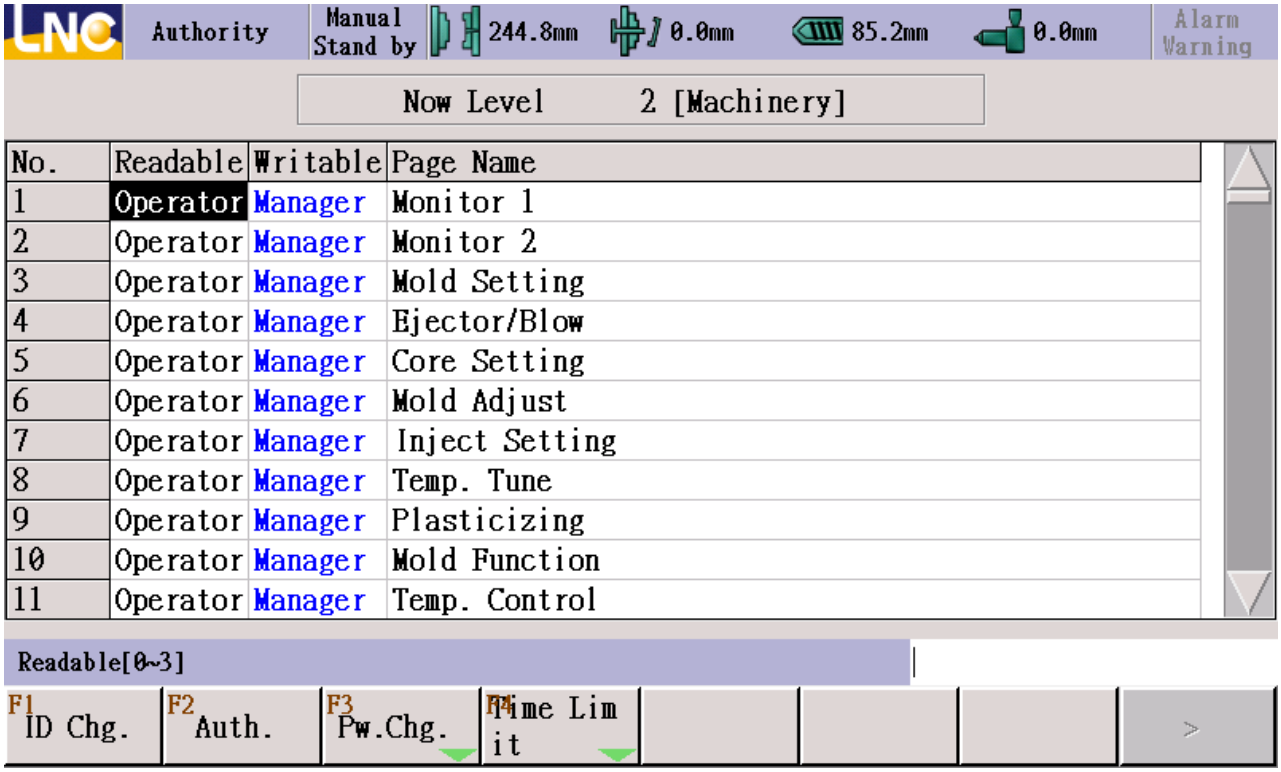
3 [System]：Controller system provider



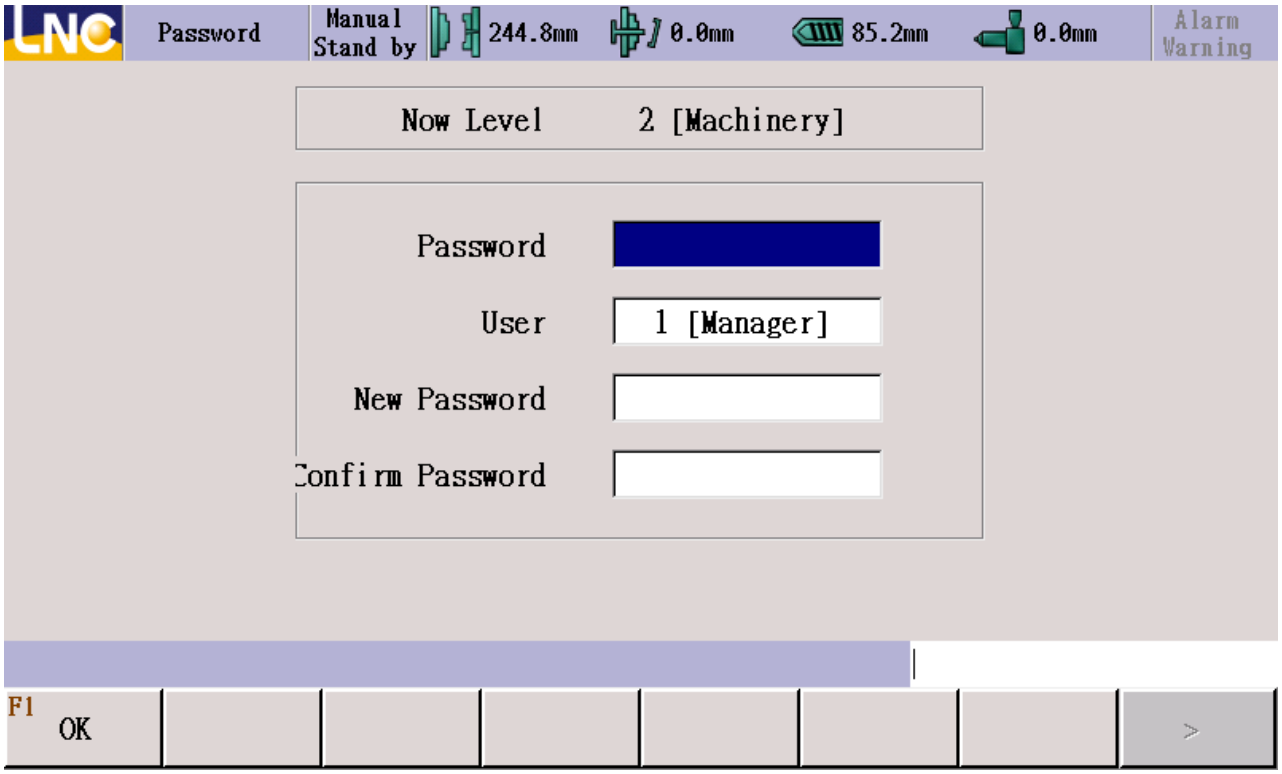
【Authority】

Every page can be set up with different display and permissions. High level can modify low level actions.

Level System > Machine maker > Manager > Operator



【Password】



<This part is to modify current password >

Steps：

1. Go to Indentity(log in→change indentity) to change to a higher level user to the right to change password.
2. Go to Passowrd change page(log in→password)
3. Column：

   User：(press enter to input)

   User authority is the same with **current** authority：Change **current** operator authority password.

   User authority **is not the same** with current authority：**(as above)**

   User：Cannot change to other higher user password.

   Machine maker：Can change other authorities password.

   Password：Input Step1 password (press enter to input)

   New password：Input new password (press enter to input)

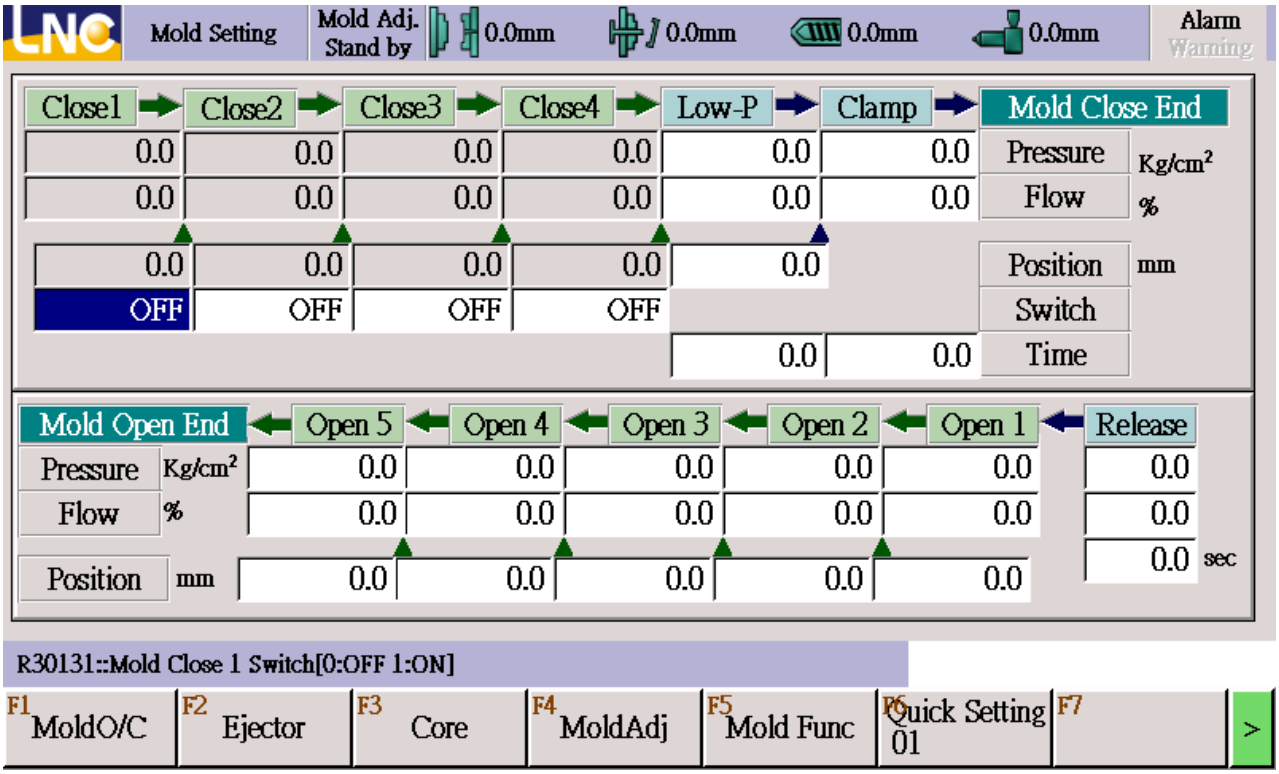
   Confirm password：Input again the new password to confirm (press enter to input)
4. Press **F1** to do password modification, wrong operation will be shown at hint bar.

4.2 Mold Setting

This is to set up open/close mold, mold adjust, slope, etc.

【Open/close mold】

This page is for open/close mold setting.



The settings in this page include:

Depending on the type of mold, the procedure for mold close is: high velocity → low velocity → low pressure → high pressure mold clamping. The other situation could also be high velocity 1→ low velocity 1→ high velocity 2→ low velocity 2→ low pressure → high pressure mold clamping; the steps are usually applied for tri-plate molds. At high-velocity mold close phase, the fully-open molds close at high velocity towards each other, and then enter low-velocity cushion phase. When the distance between closing molds is the same as the height of finished products, the phase turns to low-pressure mold protection. Finally, when male and female molds contact each other, the phase turns from low-pressure mold protection to high-pressure mold clamping.

Purposes for low-pressure mold protection：

1. If some finished product does not detach completely from the molding area and is not detected, molds will be damaged during mold close operation.
2. If the operator enters the mold clamping area by accident during operation while the machine is still running, low-pressure mold protection will protect the operator from getting hurt, or will help reduce the damage or loss.

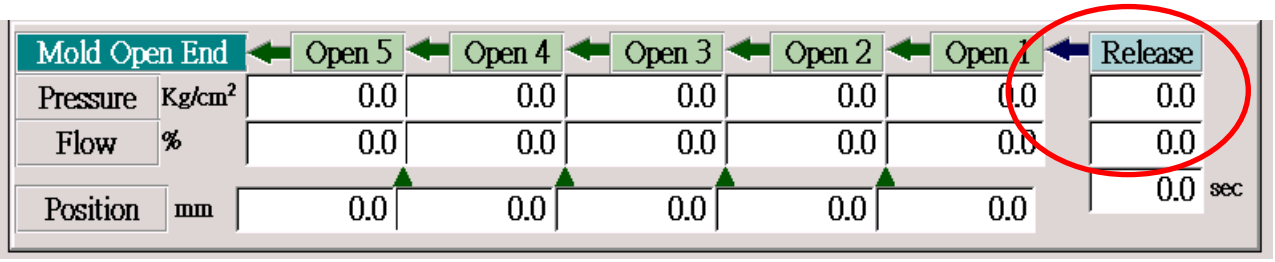
- Mold Close Pressure：Set mold close pressure of each phase. For high & low velocity mold close phases, set pressure as much as necessary to activate mold to motion. For low-pressure mold close operation, set pressure to low for mold protection. For high-pressure clamp operation, set only the required clamp pressure as excess pressure would cause overload of mechanical structure and also cause waste of energy.
- Mold Close Velocity：Set mold close velocity for each phase. If a tri-plate mold is used, 2-phase high and low velocity can be applied.
- Mold Close Position：Set mold close ending position at each phase. Depending on the type of a mold, set a proper position to switch to the next mold close phase.

  The procedure of Mold open is pressure release → low velocity mold open → high velocity mold open → medium velocity mold open → cushion. First, high pressure caused by clamping operation is released. Then, mold is open at low velocity, and a molding part is separated from the female mold at low-velocity phase. To prevent parts from damage, mold open velocity should be low. After a part is detached from female mold, male mold is opened at a higher velocity to the distance sufficient for ejection, and then travels at medium velocity and then enters cushion phase until it fully stops.

  If a robot is applied to clamp the molding part, please pay attention to the distance for the mold to travel from medium velocity phase to cushion phase. If the distance is set too short, male mode might not be able to stop stably due to mechanical inertia and hence makes strong impact on the machine.
- Release Time：Set pressure-releasing time at early phase of mold open. If the set value is too small, damage might occur during mold open.
- Mold Open Pressure：Set mold open pressure at each phase. For low velocity phase, as the purpose is to separate the molding part from the mold, the required pressure could be more. For the other phases, pressure should be set as much as necessary to activate the mold to motion.
- Mold Open Velocity：Set the mold open velocity for each phase. To prevent impact due to high velocity at cushion phase, medium velocity for mold open should not be too high.
- Mold Open Position：Set switch position of mold open for each phase according to the type of a mold.

【Open mold release pressure setting】

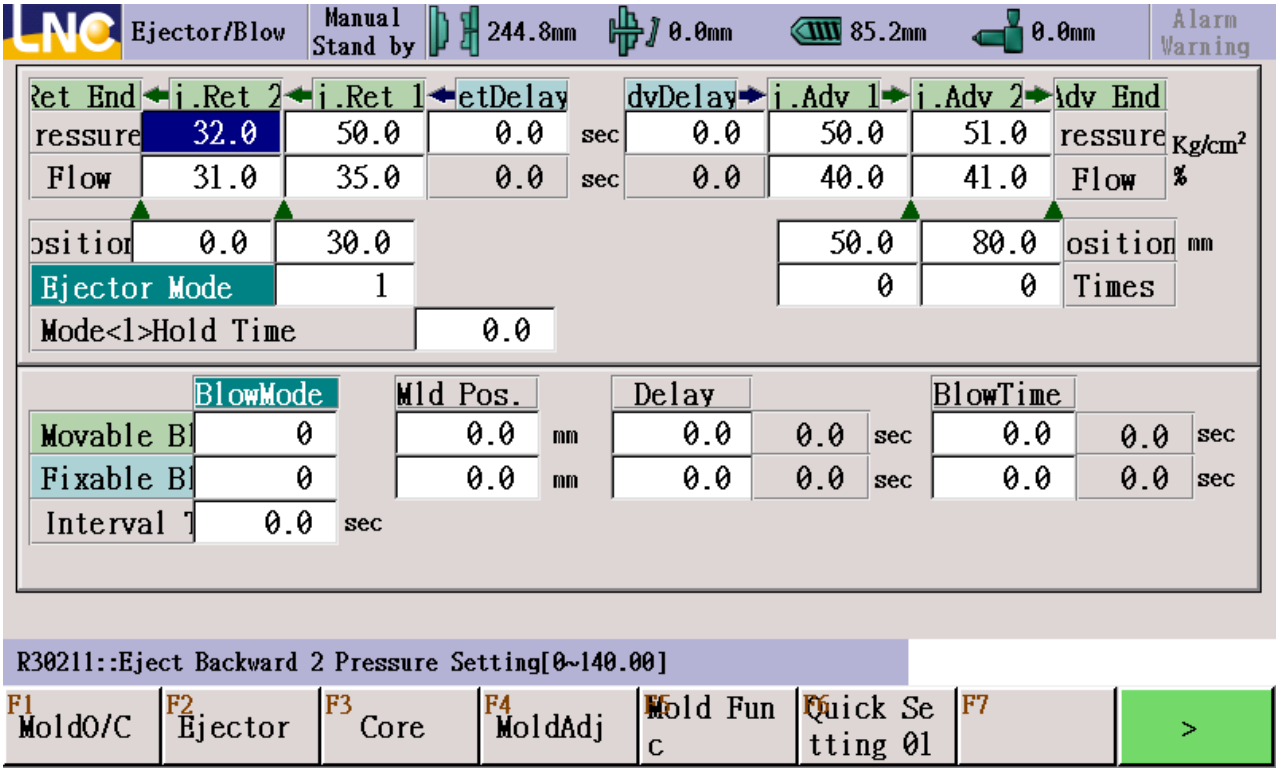
Mold open procedure is Pressure release → Low speed → High speed → Medium speed →reduce speed→cushion.



The function of pressure release is to prevent serious vibration of the machine caused by sudden release of mold close pressure during mold open. Mold open pressure release mode is a little bit different according to different forms of mold clamping.

For general hydraulic systems, mold open back pressure valve is opened to reduce mechanical vibration during pressure release.

【Ejector/Blow】



This page provides the following settings：

There are two kinds of ejection forward operation: low velocity & high velocity. Low velocity ejection is applied when the molding part is ejected apart from the male mold because high velocity might damage the molding part. After the molding part is detached from male mold, use either a robot to pick up the molding part or simply eject the molding part to finished product ejected area.

- Eject Forward Pressure：Set the ejection pressure of each phase. At low velocity ejection phase, the system should provide enough pressure to overcome adhesive force and friction between the molding part and the mold. For high velocity ejection, pressure should be set according to the design of each mold.
- Eject Forward Velocity：Set ejection velocity of each phase. The primary concern for low velocity injection setting is not to damage the molding part.
- Eject Forward Position：Set ejection ending position at each phase. Low velocity ejection position should provide at least the space for a molding part to detach from the mold so the molding part can be ejected later at a higher velocity until it can be completely picked up.
- Eject Forward Delay：Set the delay time to begin ejection after mold open operation is finished.
- Eject Counter：Set ejection number at each phase for each ejection model.

- Eject Backward Pressure：Set ejection backward pressure at each phase.
- Eject Backward Velocity：Set ejection backward velocity at each phase.
- Eject Backward Position：Set ejection backward ending position at each phase.
- Eject Backward Delay：Set delay time between the completion of ejection and the next eject backward operation.
- Eject Model：The settings of ejection modes include

  0 Not applied: Ejector is not applied.

  1 Single ejection: Ejection is completed by the operation of one ejecting forward and one ejecting backward operation.

  2 Continuous ejection: Eject forward/backward speed is decided by ejection times. When the set time is reached, the ejection program is finished.

  3 Vibration ejection: After the first ejection is finished (including low-velocity & high-velocity ejection advance), ejection is repeated according to the vibration stroke & ejection times in the vibration program until the set ejection time is reached, and then ejector moves backward (including low-velocity & high-velocity ejection backward) to finish the ejection program.

  4 Stop after ejection: After finishing ejecting forward according to the set speed and pressure setting of advance ejection, ejector stops at the farthest point and then ready to eject backward when the next cycle starts. This option is most suitable when a robot is applied to pick up the finished product.

  5 Stop after vibration: After vibration is finished according to the set vibration stroke and ejecting forward time, ejector stops at the farthest point and then starts to eject backward when the next cycle starts. This option is most suitable when a robot is applied to retrieve the finished product.
- Single Model Stay Time：When the ejection model is set to single ejection, this option sets the stay time which starts counting from ejecting forward is stop at set position. When the duration of the set time is reached, ejector starts to eject backward.
- Blow Model：Blow model types are listed as below:

  0 Not applied: Blowing function is not applied.

  1 During mold open: Air blow valve is switched on when the mold is open to the designated position.

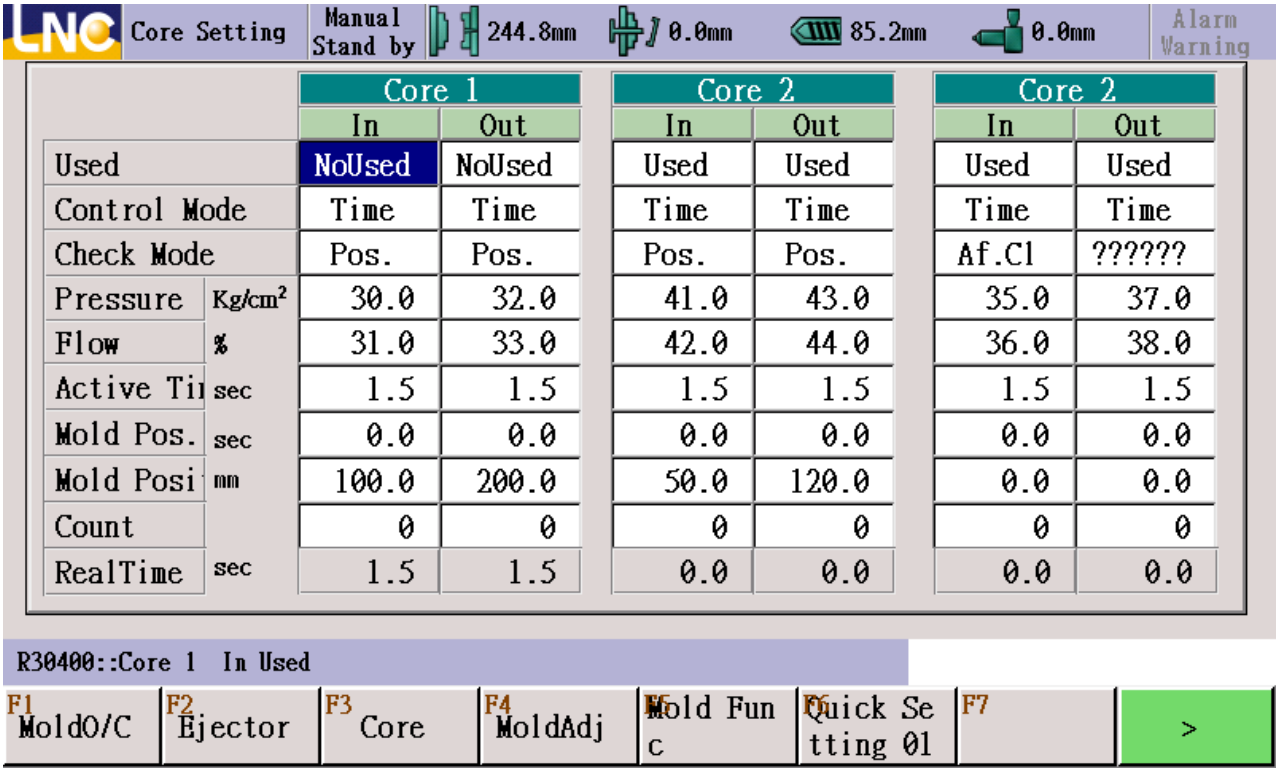
  2 After mold close: Air blow valve is switched on when mold is open to the ending position.

  3 During charging: Air blow valve is switched on during plastic charging after injection is completed.
- Blow Start at Mold Position：When blow mode is set to “during mold open,” air

blow operation is executed when mold is open at the position defined by this setting.

- Blow Start Delay Time：This option sets the delay time between the completion of mold open and the opening of air valve when blow mode is set to after mold open.
- Blow Action Time：Set the start time of air blow valve.
- Interval Time：Set air blow motion into multiple stages by setting the interval time. For example, if the blowing time is set to 6 seconds, and the stop time is set to 1 second, and the action will be: blow (1 sec)- stop (1 sec)- blow (1 sec)- stop (1 sec)- blow (1 sec)- stop (1 sec).

【Core】



		Core 1		Core 2		Core 2	
		In	Out	In	Out	In	Out
Used		NoUsed	NoUsed	Used	Used	Used	Used
Control Mode		Time	Time	Time	Time	Time	Time
Check Mode		Pos.	Pos.	Pos.	Pos.	Af.Cl	??????
Pressure	Kg/cm²	30.0	32.0	41.0	43.0	35.0	37.0
Flow	%	31.0	33.0	42.0	44.0	36.0	38.0
Active Ti	sec	1.5	1.5	1.5	1.5	1.5	1.5
Mold Pos.	sec	0.0	0.0	0.0	0.0	0.0	0.0
Mold Posi	mm	100.0	200.0	50.0	120.0	0.0	0.0
Count		0	0	0	0	0	0
RealTime	sec	1.5	1.5	0.0	0.0	0.0	0.0

As the finished products require, the “Core Backward/Forward” and “Screw” functions sometimes are added to molding design. The standard machine provides 3 sets of Core/Screw for users. The hydraulic interface of the machine can be connect to cores or screw mechanism, if there is a limit switch or a counter, please connect the wiring to the contacts in the power distribution box.

This page provides the settings as listed below：

- Function Selection：Output points can be applied by cores or screws. The options are 0：Not applied; 1：Yes
- Control Selection：Select the control method of Core backward/forward and screw.

  0 By time：Suitable for Core & Screw functions. When pressure & velocity setting arrives the time, stops.

  1 By number of times：Suitable for Screw functions. When the screw device has a sensor, motion stops when the screw reaches the preset times.

  2 By proximity switch：Suitable for Core & Screw functions. When pressure & velocity setting arrives the proximity switch, stops.
- Control Mode：Choose core & screw forward/backward

  Core Backward：

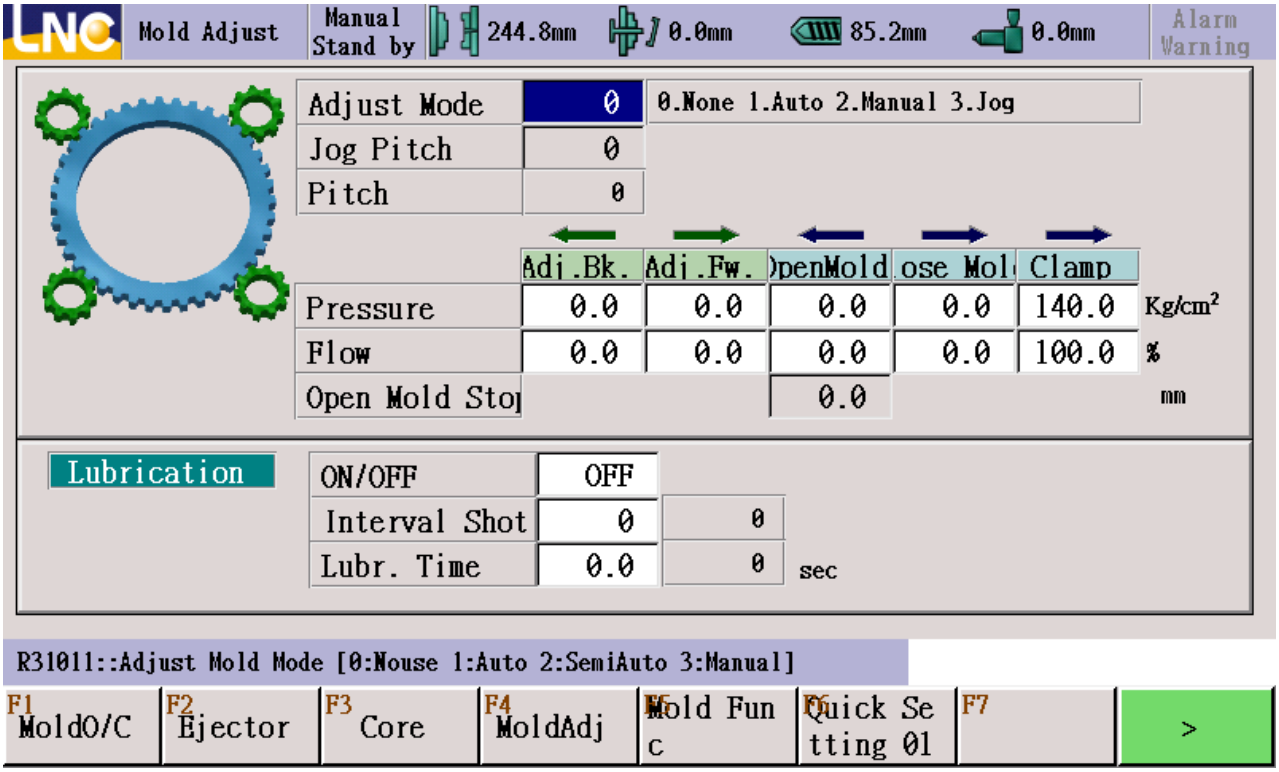
  0 before close mold：Run core backward before close mold.

1 closing mold(position)：When arrives plate setting position, run core backward.
2 after close mold：Run core backward after close mold.
Core Forward：
0 before open mold：Run core forward before open mold.
1 opening mold(position)：When arrives plate setting position, run core forward.
2 after open mold：Run core backward after open mold.
3 after eject：Run core backward after eject.

- Pressure：Set the pressure of core and screw operations at each phase.
- Velocity：Set speed for core and screw motion at each phase.
- Action Time：When the control method is set to “By Time,” this option sets the time for core and screw operations at each phase. When the control method is set to limit switch or counter, this option sets the monitoring time. When the operation time exceeds the set value, operation is stopped, and an alarm is triggered.
- Screw Counter：When screw operation is chosen, the cog tooth number of the screw is set here. When the counter reaches the set value, the motion is stopped.
- Plate Position：This option sets the designated position of mold open when Core backward or Core forward operation is started. This function must be applied with a proper hydraulic system of the machine.

【Toggle Machine Adjust】

This page is to set horizontal toggle machine mold adjust and lubrication.



When toggle type clamping unit is applied, the thickness of mold needs to be adjusted according to different thickness of mold and different clamping force required. This procedure is called mold adjustment. After the adjustment is finished and execute production, try not to change the thickness of mold, otherwise, different clamping force might cause quality discrepancy.

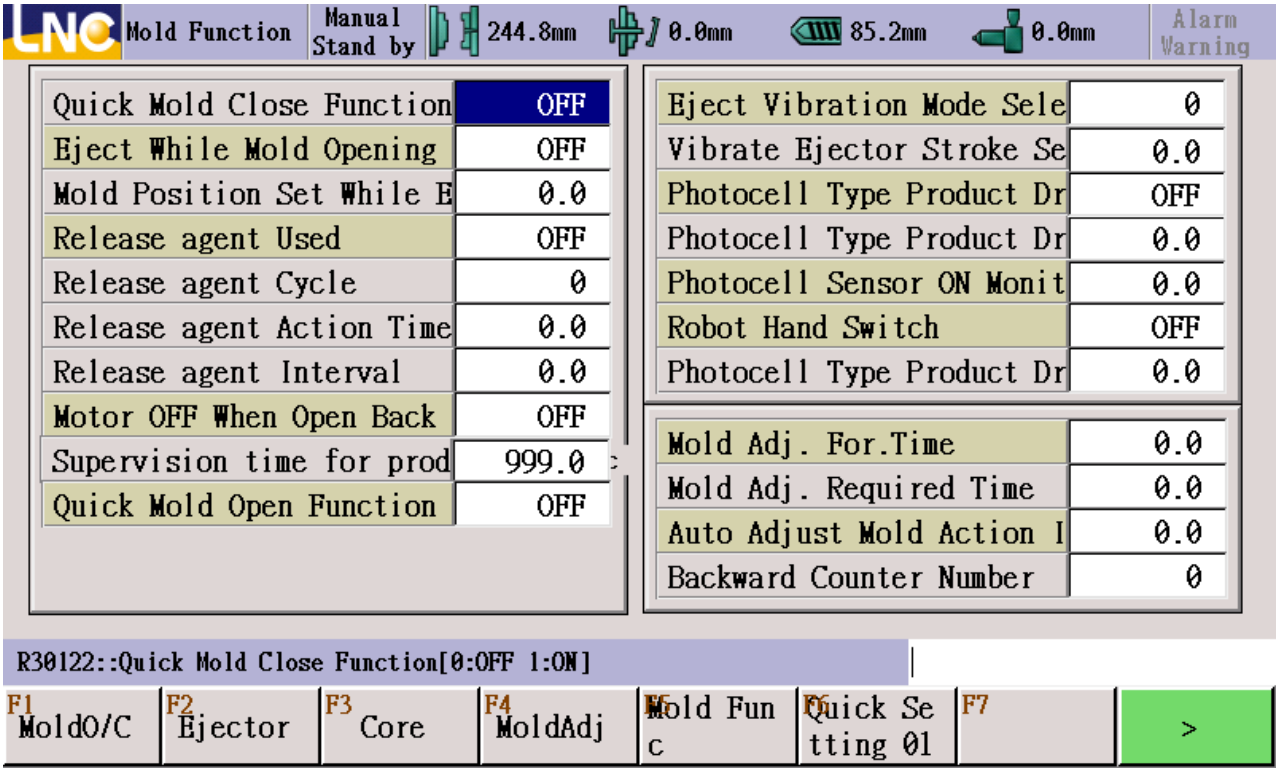
During mold adjustment, switch the mode on OP panel to Mold Adjust Mode, and set Mold Adjust Mode to any mode except [0: not applied], then motion can be executed. The setting options are：

- Mold Adjust Mode：The mold adjustment mode are categorized as below:
  - 0 Not applied：the keys of MoldAdj. Forward and Backward are not effective if the option is selected.
  - 1 Automatic： if automatic adjustment is applied, the controller will decide the difference of mold thickness before and after mold adjustment, the clamping force value after working with mold adjustment, and adjust the mechanism to generate the set clamping force.
  - 2 Manual：Press MoldAdj. Forward key on the panel, then the mold adjust travels forward, and release the key the motion is stop. Mold adjust backward is vice versa.
  - 3 Jog：Refer to the setting of Jog distance when this mode is selected. Press

one time to move one Jog distance.

- Mold adjust Teeth：Under JOG, mold adjust forward teeth numbers.
- Pressure：Set the pressure at each phase.
- Velocity：Set the speed at each phase.
- Position: Open mold position under auto mold adjust mode. When mold adjust is in the auto mode, this setting will be open. If this setting is 0, the stop position will be until first section when opening.
- Interval Shot：Control the interval shot of using lubrication.
- Lubricate Time：Control the time of using lubrication.

【Mold Function】

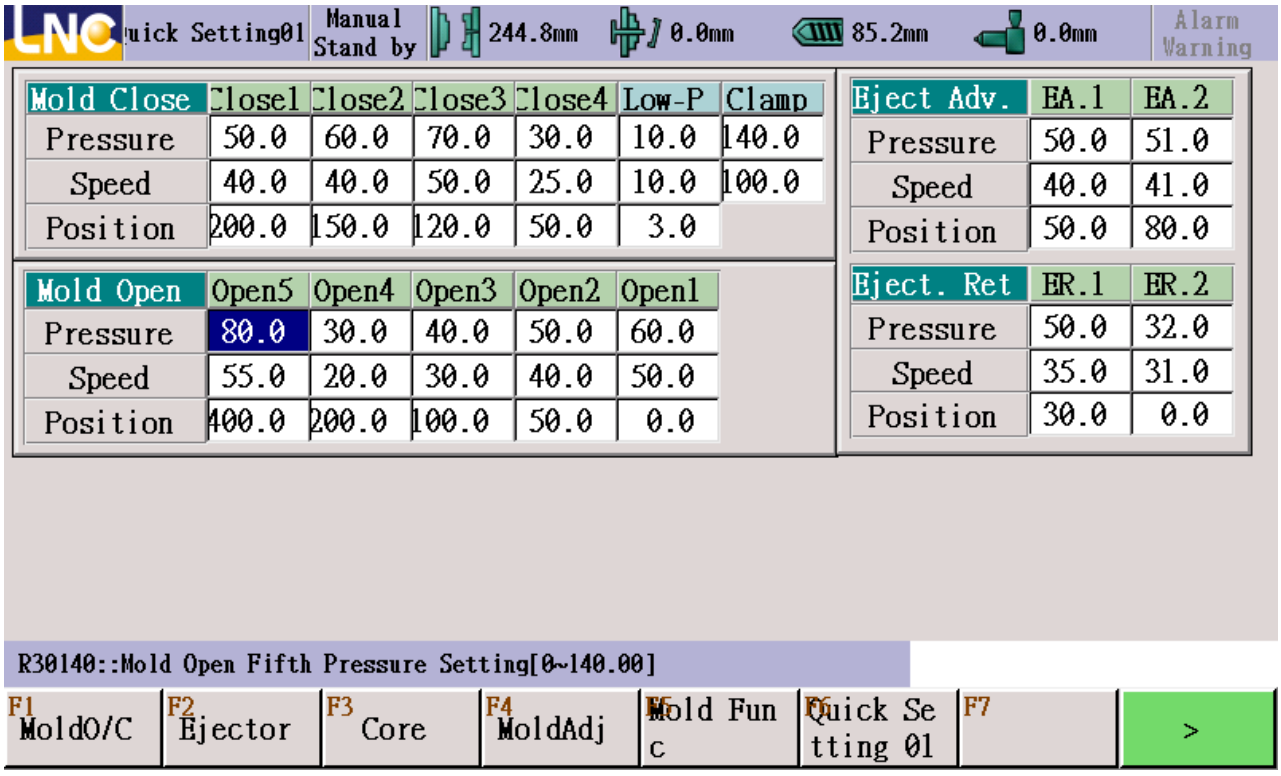


- Open Mold & Plasticizing：When open mold and plasticizing use different power, these 2 actions can be down together.
- Close Mold Differential Function：Under quick close mode, use oil circuit's differential method to add up close mold speed. Need to pay attention to quick close mold >slow close mold, wrong setting will damage the mold.
- Open Mold & Eject：When open mold reaches synchronous eject position, will do eject together.
- Open Mold Quick Function：When reaches to open mold quick start position, will turn on quick valve.
- Open Mold Quick Position：Set up open mold quick start position.

- Robot ：Set up if robot use or not.
- Good Drop Detect Switch：If use sensor or detect device, make this function ON.
- Good Drop Detect Time：If use sensor or detect device, choose to be monitor drop time, over setting, send alarm.
- Robot Pull Out Time：Under semi-auto, if pull time is over setting time, send alarm.
- Vibration Eject Mode：Can be position or time. If for position, vibration eject will use position to do eject, if for time, will by time to do eject.
- Vibration Traverse：When eject mode is vibration eject, it will be eject traverse.
- Mold Forward Confirm Time：Confirm time of auto mold forward.
- Interval Time of Mold Adjust：Interval time of auto mold adjust.
- Safety Door Open Stop Motor：If safety door open will trigger cut motor switch.
- Product Not Take Out Monitor Time Under Semi-auto：After semi-auto action, if safety door didn't open to take out product, alarm.
- Close Mold Button >Auto：Press close mold button to trigger auto mode.

【Quick Setting 1】

Set up pressure, velocity, position for open/close mold and eject.

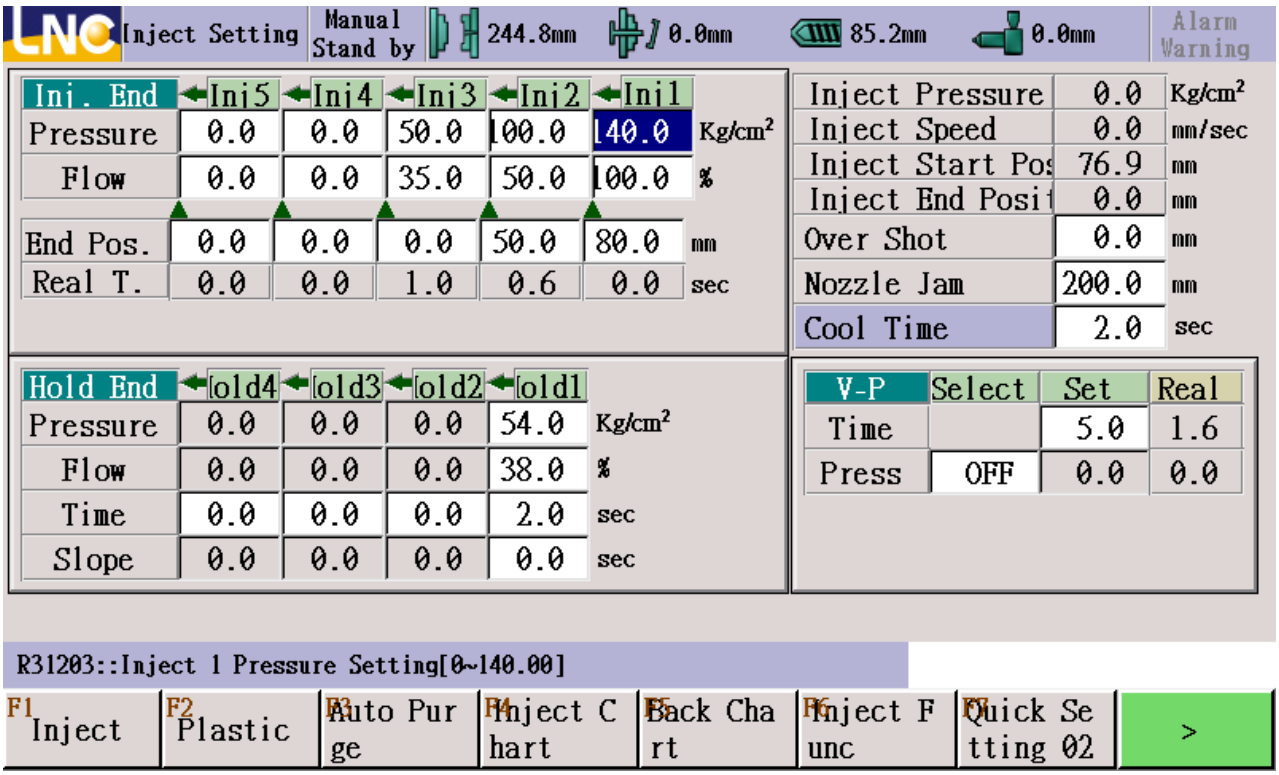


4.3 Injection Group

Injection group provides the injection-related settings and information, including injection, holding pressure, plasticizing, injection unit motion, and injection/holding pressure curves.

【Injection hold pressure】

This page provides the settings of pressure, velocity, time, and position for injection and holding pressure.



The settings in this page include:

- Injection Pressure：This value sets the pressure of injection cylinder. If the set pressure is too low, the target velocity might not be achievable.
- Injection Velocity：Set the velocity of injection screw traveling forward at some phase. The set range is 0 ~ 100%, which refers to the ratio of the set value to the maximum injection velocity.
- Injection Position：Set the ending position of injection at some phase. When the injection screw position (the value) is smaller than the set value, injection is switched to the next phase. When set to 0.00, this setting is not applied, and the controller neglects the set value of pressure and velocity at the designated phase.
- V-P Changeover Function Selection：Set the changeover method of injection and holding pressure. The changeover methods include changeover of position,

time, and injection pressure. When injection pressure changeover is selected, please verify in advance if the injection cylinder is equipped with an injection pressure sensor. Changeover methods are multiple choices; when over two methods are selected, changeover is processed depending on which method is approached first.

- ◆ V-P Changeover Setting：Set the changeover value of injection and holding pressure. When this function is activated, this value decides when the system stops injection program and starts holding pressure program.
  1. Time changeover: When injection time (the value) is larger than the set time, injection program is stopped and holding pressure program is started.
  2. Pressure changeover: When injection pressure is larger than the set pressure, injection is stopped and holding pressure program is started.
- ◆ Hold Pressure：Pressure setting of each period.
- ◆ Hold Pressure Velocity：Velocity setting of each period.
- ◆ Hold Pressure Time：Continuing time of each period.
- ◆ Hold Pressure Slope：Setting of two holding pressure period changing slope.

【Nozzle Jam Position Setting】

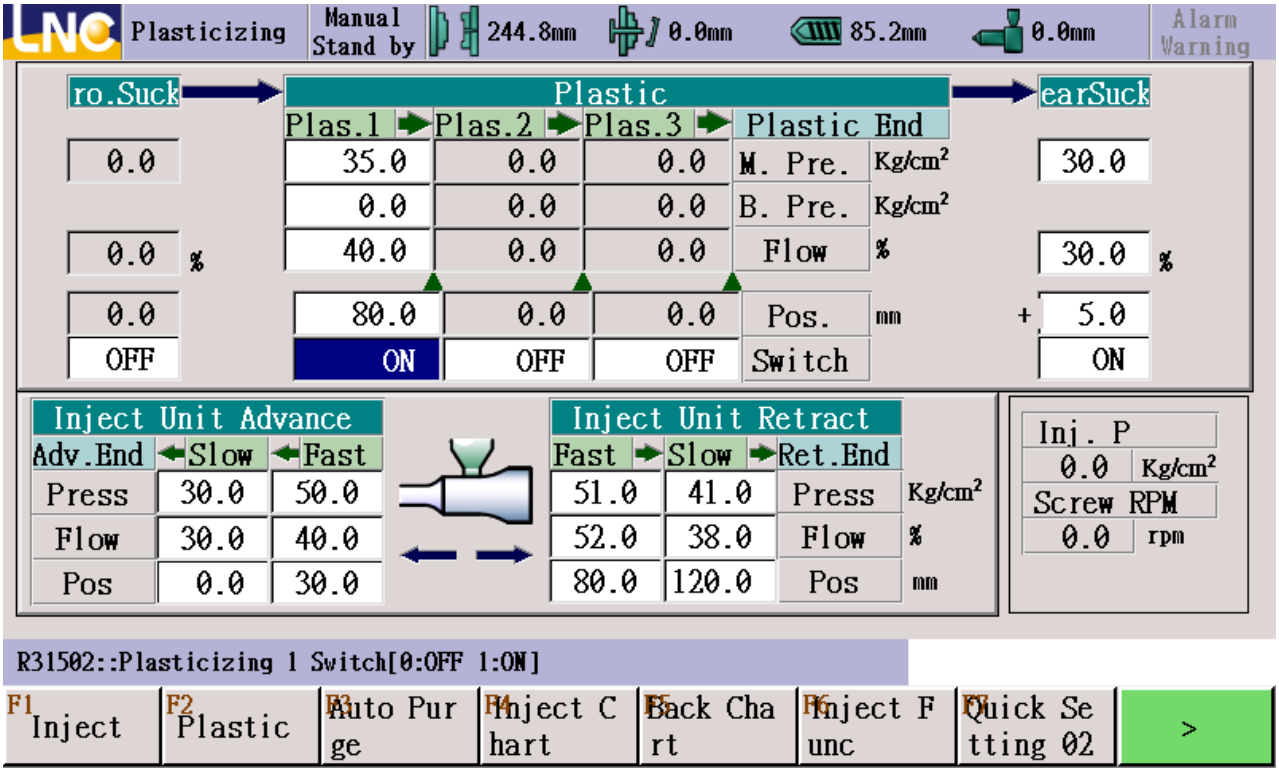
During Injection, the cold material may jam in the nozzle and cannot enter the barrel. At this time, injection end position may recess a lot.

If the mold cannot fit tightly and the cavity did not have enough resistance, the injection screw can move forward a lot and make the material overflow. Injection end point will be way to forward than other times.

Users can use the injection end position to monitor jam or overflow situation. In the Injection holding pressure page, there is a good product check group (users need to make this switch ON at the page of quality control, the monitor functions will be valid).

【Plasticizing/suckback】

This page provides the relative settings for plasticizing process and the motion of injection unit.



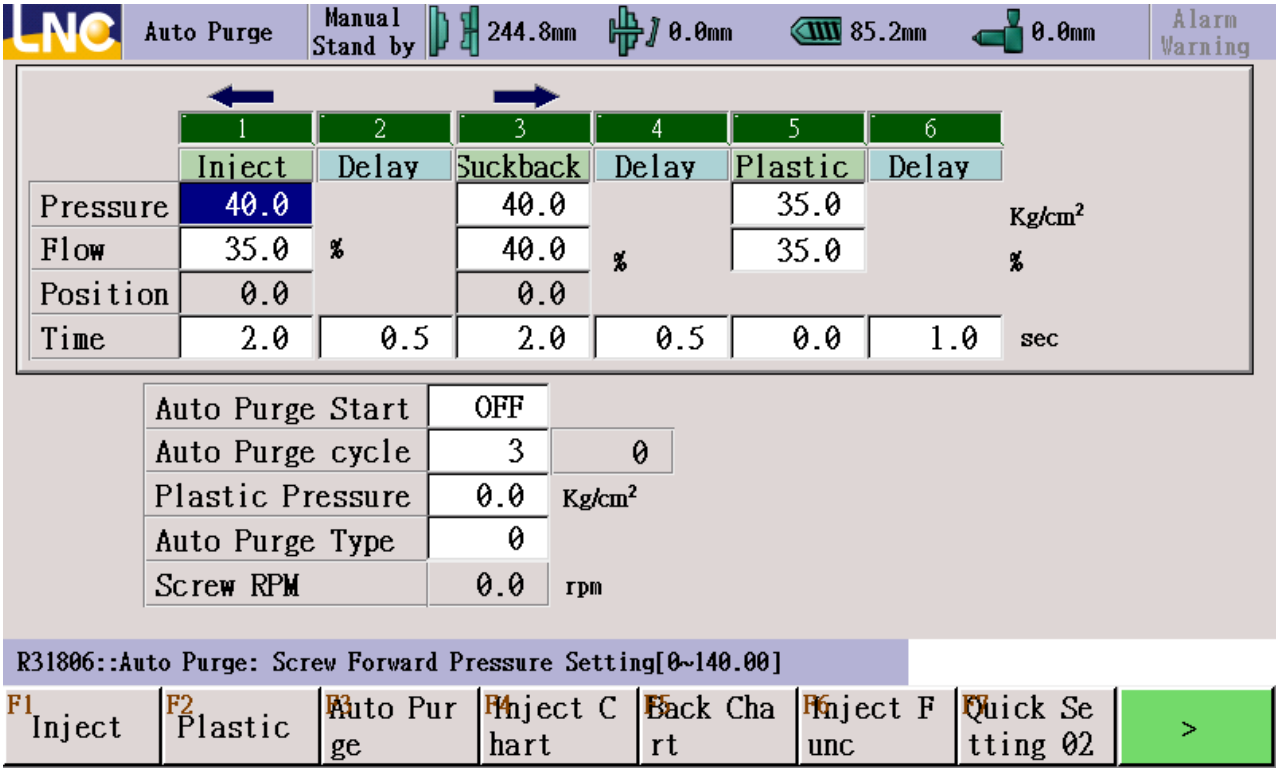
This page provides the settings of the following functions:

- Front Suckback Function Selection：Set if to activate the Front Suckback function. When activated, screw will travel backward to the set position before plasticizing is started. If screw position (the value) is larger than the ending position of front suckback position before plasticizing starts, plasticizing is started without screw traveling backward.
- Front Suckback Pressure：Set the pressure during the motion of front suckback.
- Front Suckback Velocity：Set the velocity during the motion of front suckback.
- Front Suckback Position：Set the ending position of front suckback motion.
- Plasticizing Pressure：Set the pressure that activates the screw to rotate during plasticizing.
- Plasticizing Back Pressure：Set back pressure of screw moving backward during plasticizing at each phase. Please set a proper value in reference to all related plastic technical information.
- Plasticizing RPM：Set screw RPM during plasticizing at each phase. Please set a proper value in reference to other relative plastic technical information.
- Plasticizing Position：Set the ending position of plasticizing at each phase.

- Plasticizing Switch：Set if need this section's plasticizing.
- Rear Suckback Function Selection：Set the distance for injection screw to travel backward after plasticizing is finished.
- Rear Suckback Pressure：Set the pressure for rear suckback motion.
- Rear Suckback Velocity：Set the velocity for rear suckback motion.
- Rear Suckback Position：Set rear suckback amount (distance) after plasticizing is finished.
- Nozzle Forward Pressure：Set up each section pressure.
- Nozzle Forward Velocity：Set up each section velocity.
- Nozzle Forward Time：Set up each section time, only valid under injection unit position is time setting.
- Nozzle Forward Position：Set up each section position, only valid under injection unit position is scale.
- Nozzle Backward Pressure：Set up each section pressure.
- Nozzle Backward Velocity：Set up each section velocity.
- Nozzle Backward Time：Set up each section time, only valid under injection unit position is time setting.
- Nozzle Backward Position：Set up each section position, only valid under injection unit position is scale.
- Nozzle Backward After Cooling：If move nozzle backward after plasticizing.

【Auto Purge】

This page provides the information and settings for automatic purging.



The procedure of automatic purging is as below：

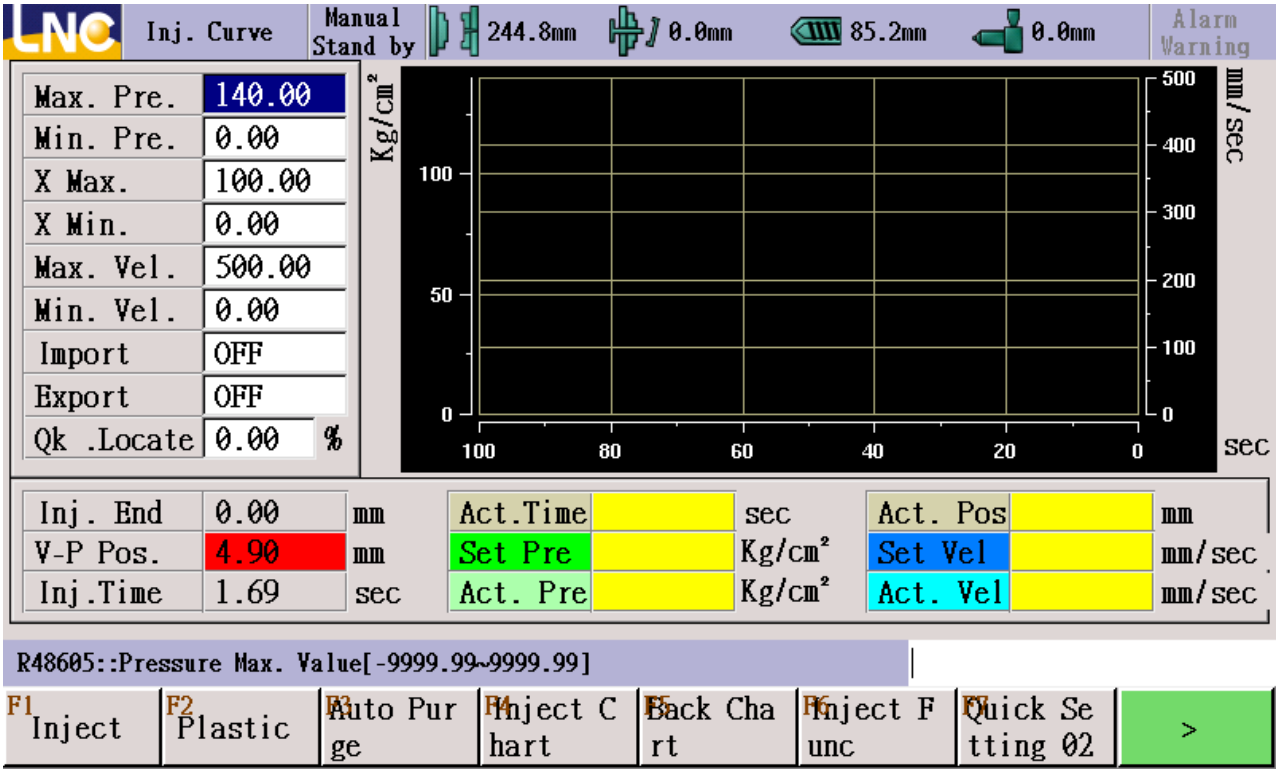
Screw Forward → Screw Backward → Plasticizing.

- Screw Forward Pressure：Set the purging pressure of a screw traveling forward.
- Screw Forward Velocity：Set the purging velocity of a screw traveling forward.
- Screw Forward Time：Set the purging time of a screw traveling forward.
- Purge Delay：Set delay time for a screw to travel backward after forward purging operation is finished.
- Screw Backward Pressure：Set the suckback pressure of a screw traveling backward.
- Screw Backward Velocity：Set the suckback velocity of a screw traveling backward.
- Screw Backward Time：Set the suckback time of a screw traveling backward.
- Screw Backward Delay：Set delay time for a screw to return for plasticizing after backward operation is finished.
- Screw Rotate Pressure：Set rotational pressure of a screw for plasticizing.
- Screw Rotate Velocity：Set rotational velocity of a screw for plasticizing.
- Screw Rotate Time：Set rotational time of a screw for plasticizing.
- Interval Delay：Set the interval time between purging cycles.

- Auto Purge Function Selection：Set if to activate the Automatic Purging function. When set ON, press the Purge button on the operation panel in order to start the operation.
- Auto Purge Cycle Counter：Set the cycle times of automatic purging.
- Screw Rotate Backpressure : To set screw rotate backpressure.

【Injection Curve】

This page provides the pressure and velocity curves during injection.



Injection curves show the relationships among pressure, speed, time, and position during injection. They also serve as reference for users to modify injection-related settings. The settings provided include：

- Max. Pressure：Set the maximum pressure to be displayed on the screen. When some actual pressure exceeds the set value, it will not be displayed.
- Min. Pressure：Set the minimum pressure to be displayed on the screen. When some actual pressure is lower than the set value, it will not be displayed.
- Clear in Each Shot Function Selection：Set if to clear the curves on the screen before each shot starts. When set OFF, the curves of the previous 10 shots are displayed as grey-level images in the diagram.
- X-axle Select：Set the unit system of X axle to be time or position in order to show the relationship between speed and position or speed and time, or the

relationship between pressure and position or pressure and time.

- Quick Locate：Move cursor to the item to display the value.
- Max. Velocity：Set the maximum velocity to be displayed on the screen. When some actual velocity exceeds the set value, it will not be displayed.
- Min. Velocity：Set the minimum velocity to be displayed on the screen. When some actual velocity is below the set value, it will not be displayed.

When the curves are displayed, they are also showing the following information:

Injection End Position：Shows ending position of a screw after injection and holding pressure are finished.

V-P Changeover Position：Show the V-P changeover position of a screw.

Injection Time：Show total time from the beginning of injection to the completion of holding pressure operation.

Current Pressure：Show the current pressure of the injection cylinder measured by the pressure sensor (only effective when applied with a pressure sensor; the sensor is optional).

Setting Pressure：Shows the set pressure of the injection cylinder where the cursor points at in the curve diagram.

Actual Pressure：Shows the actual pressure of the injection cylinder measured by the pressure sensor where the cursor points at in the curve diagram.

Current Velocity：Shows the current screw velocity measured by a position detector.

Setting Velocity：Shows the set velocity where the cursor points at in the curve diagram.

Actual Velocity：Shows the screw actual velocity where the cursor points at in the curve diagram as measured by a position detector.

Injection Start Position：Shows screw position when injection starts.

Actual Time：Shows the actual time during injection where the cursor points at in the curve diagram.

Actual Position：Shows the actual screw position where the cursor points at in the curve diagram.

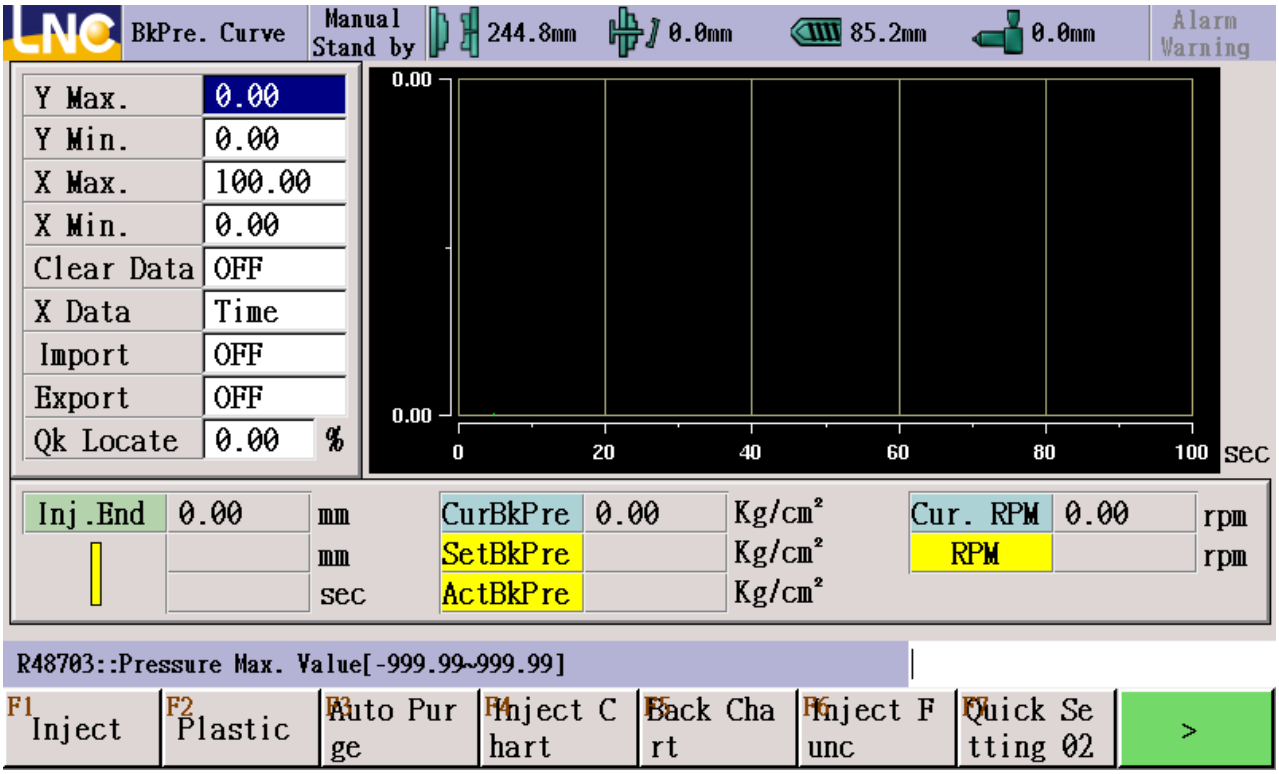
Button descriptions:

- Original size：To restore the zoom-in/-out curve diagram back to the original size.
- Zoom-in：To enlarge the curve diagram to check the relationships among pressure, speed, & position.
- Zoom-out：To reduce the curve diagram to check the relationships among pressure, speed, & position.

- Cursor left：Move cursor to left to the designated position.
- Cursor right：Move cursor to right to the designated position.

【Back pressure Curve】

This page shows the curves of back pressure and screw rotational velocity during plasticizing.



Back pressure curves show the relationship between back pressure and screw RPM to positions during plasticizing. They also serve as reference for users to modify plasticizing-related settings. The settings provided include：

- Max. Pressure：Set the maximum pressure to be displayed on the screen. When some actual pressure exceeds the set value, it will not be displayed.
- Min. Pressure：Set the minimum pressure to be displayed on the screen. When some actual pressure is lower than the set value, it will not be displayed.
- Clear in Each Shot Function Selection：Set if to clear the curves on the screen before each shot starts. When set OFF, the curves of the previous 10 shots are displayed as grey-level images in the diagram.
- X-axle Select：Set the unit system of X axle to be time or position in order to show the relationship between speed and position or speed and time, or the relationship between pressure and position or pressure and time.
- Quick Locate：To quick locate the cursor to the set point. If the unit system of X

axle is set to time, the value is shown by its percentage of the total time. If X coordinate unit is position, position is located by percentage.

Below info will be show together with curve info：

Injection End：The screw position when injection and holding pressure complete.

Cursor Position：Show corresponding injection screw position at the cursor place and the plasticizing start time.

Current Back Pressure：Show current back pressure value.(This function will need to havetransducer (optional))

Set Back Pressure：Back pressure value at the cursor place.

Current Back Pressure：Exact measuring back pressure at the cursor place.

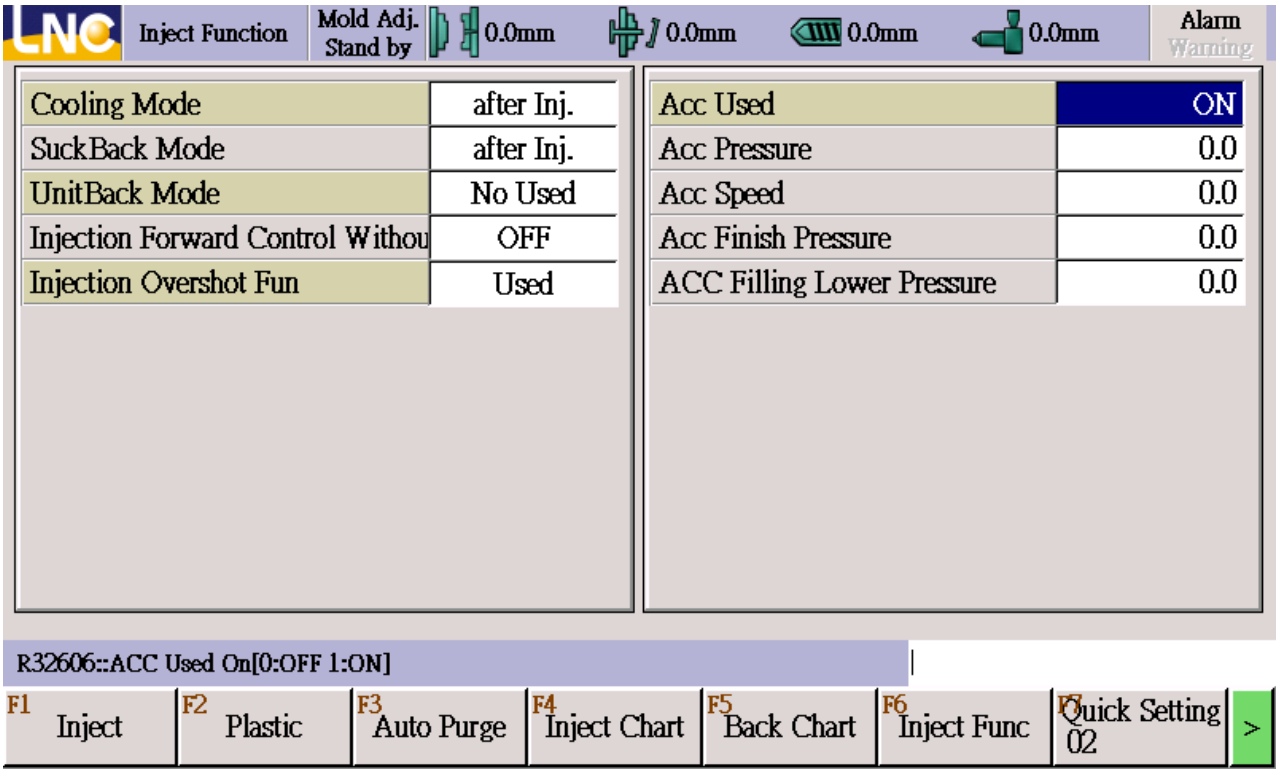
Current RPM：RPM of screw.

Screw RPM：Measuring screw RPM at the cursor place.

Plasticizing Stop Position：Injection screw stop position when plasticizing ends.

Plasticizing Stop Time：Injection screw stop time when plasticizing ends.

【Injection Function】

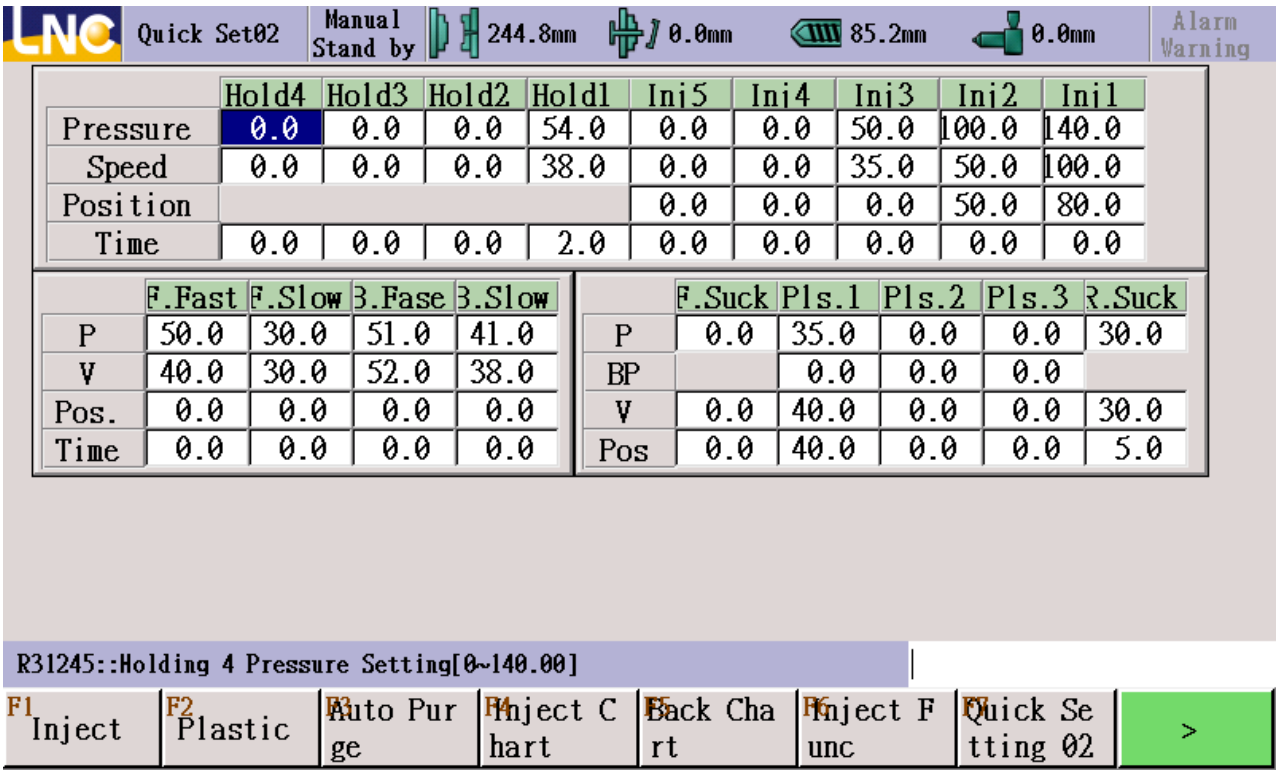


- Cool Timing Start：Set up timing for cooling.
- Suckback Method：Select after plasticizing or after cooling.
- Nozzle Backward Method：N/A or after plasticizing or after cooling.

- ◆ Nozzle Forward Manual：Nozzle forward in manual is not limited, can continue move forward.
- ◆ Injection Monitor：If monitor overflow or insufficient material.
- ◆ Accumulator Selection：
  - ■ Accumulator：If there is accumulator, make this ON.
  - ■ Accumulator Charge Pressure：Pressure setting.
  - ■ Accumulator Charge Velocity：Velocity while charging.
  - ■ Accumulator Complete Pressure：Complete pressure setting (If use transducer)
  - ■ Charge Low Limit：Check charge low limit value (If use transducer)

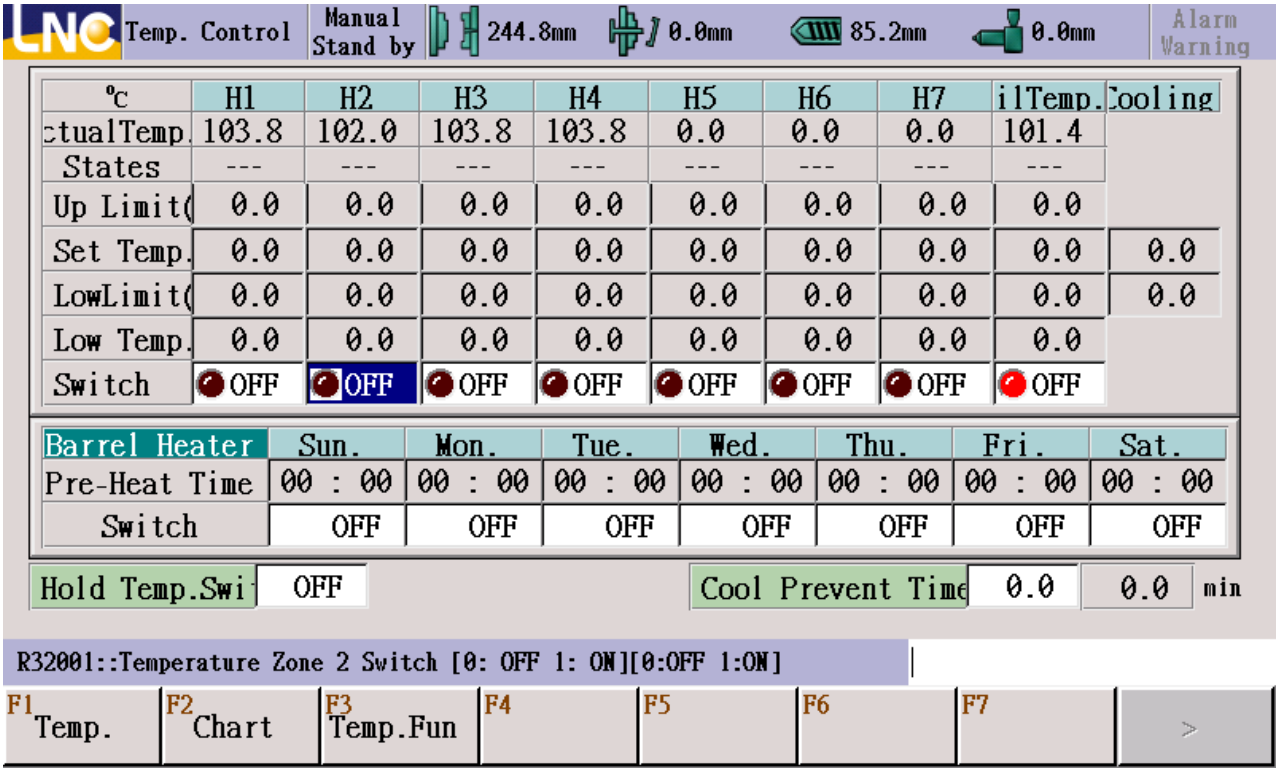
【Quick Setting 2】

Set up injection, nozzle forward/backward, suckback.



4.4 Temperature Group

【Temp. Setting】



The settings of this page include：

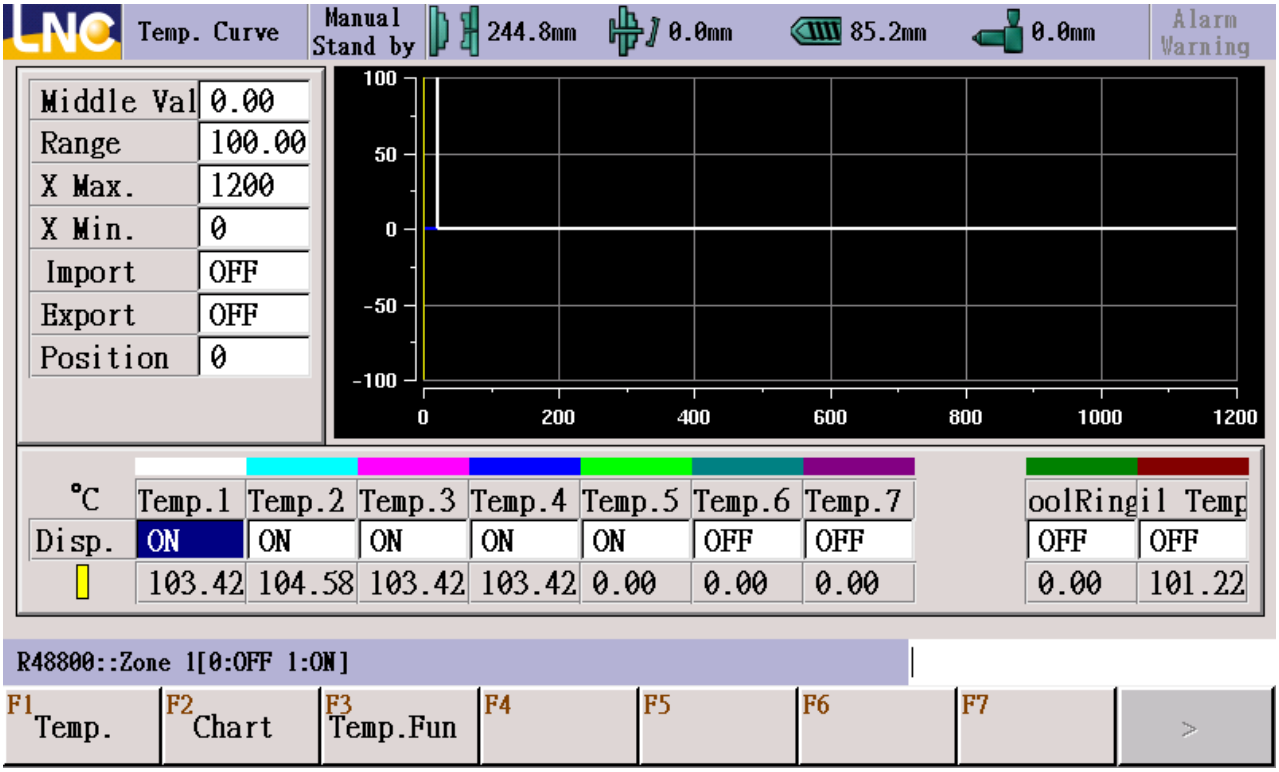
- Temperature Set Value：Set target temperature for barrel at each phase after heater is activated. If the temperature of oil and cooling ring exceed the set value, an alarm is triggered.
- Up Limit：Set the upper limit of temperature. When the actual temperature of some phase exceeds the upper limit, the heater output to that phase is stopped and an alarm is triggered.
- Low Limit：Set the lower limit of temperature. When the actual temperature is below the lower limit, injection/plasticizing volume measuring operation are stopped and an alarm is triggered.
- Heater Switch：Set if to turn on heater for each phase. When turned ON, the temperature of the designated heater is monitored. When turned OFF, the monitoring temperature set value for the designated heater is ignored.
- Temperature Limit：Set temperature limit for each heater. If the temperature exceeds the set value, heaters' main power is turned off automatically.
- Hold Temperature Switch：When not in operation, activate this function, and the controller will keep barrel at the set temperature to prevent raw materials from getting degraded at the remaining high temperature due to production.

◆ Hold Temperature：Set the value of holding temperature.

Cold Protection Time：When the machine and heater are both activated, barrel is heated until the temperature reaches the preset value for each phase. However, within cold protection time the motions of injection、injection unit backward and plasticizing are not able to be executed. It's for preventing the screw might be damaged by plastic materials which are not molten completely.

【Temp. Curve】

This page shows the temperature curves of barrel, cooling ring, and oil at each phase.

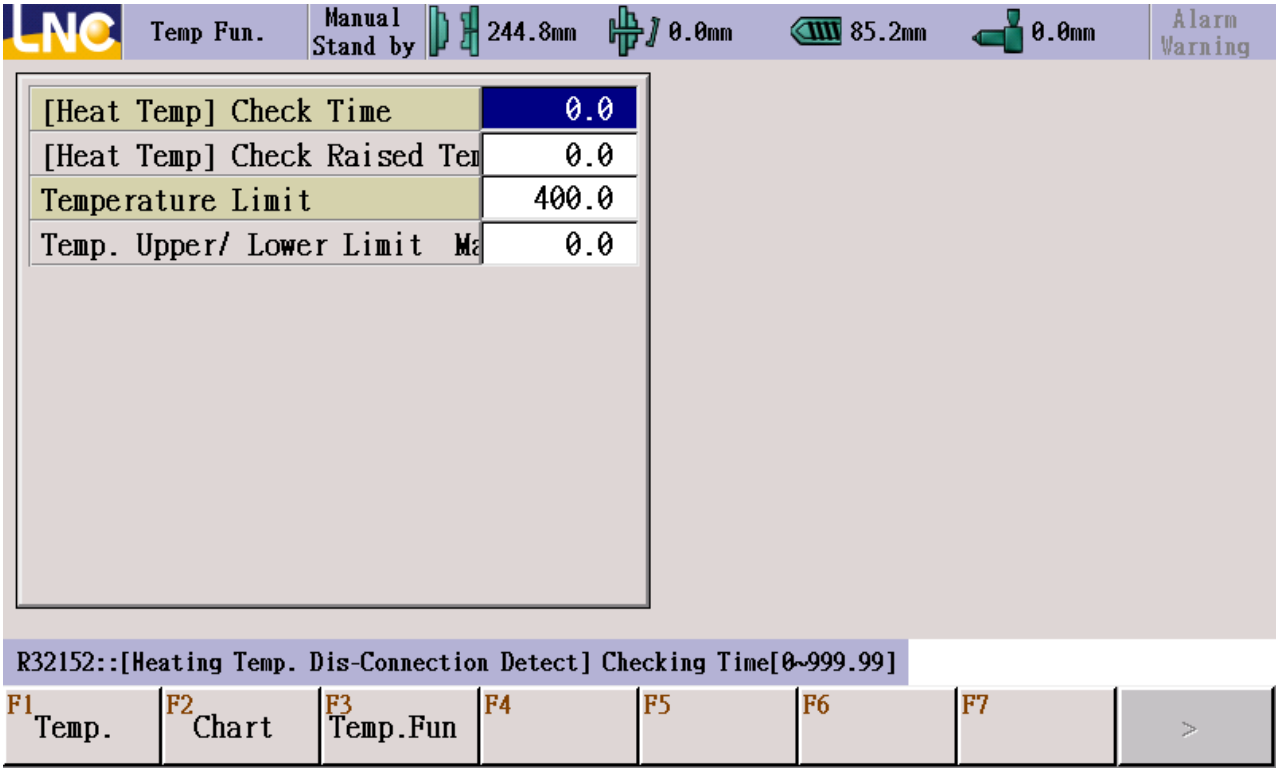


Temperature curves show up to 1200 samplings collected every 6 seconds, which equal to the temperature data in the most recent 2 hours.

Users can set if to display each temperature curve by selecting ON/OFF below each phase. When ON is selected, the assigned curve is shown in the corresponding color in the diagram.

Key in a value in the "Locate to" text box, and the cursor will go to the assigned position. As the cursor moves, the text box below the temperature phase will also display the temperature where the cursor points at.

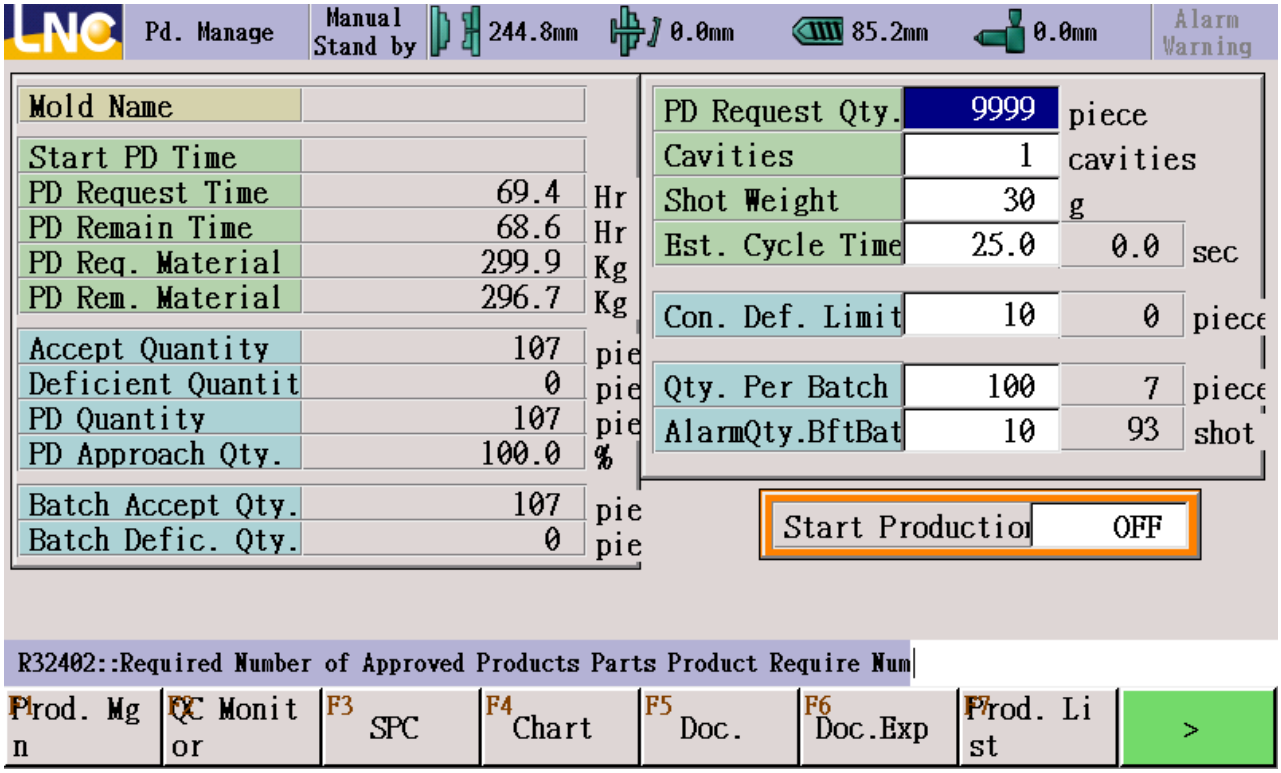
【Temp. Function】



- [Heating Break Down Check]Check time：During this period, system must heating up to certain temperature, otherwise system will send alarm.
- [Heating Break Down Check]Check heating temperature：During this period, system must heating up to certain temperature, otherwise system will send alarm.

4.5 Production Monitor

【Production Manage】



The settings in this page include：

- Accept Product Required Number：Set the required number of defect-free products in this production.
- Cavities Per Shot：Set the effective cavity number of a mold.
- Weight Per Shot：Set the product weight per shot to predict the estimate total weight of raw materials required for this production.
- Cycle Time：Set the estimate cycle time per shot to calculate the remaining production time. The actual manufacturing time is shown next to this value as a reference for users.
- Allowed Continue Deficient Product Number：Set the allowed number of successive deficient products. For relative monitoring standards of this value, please go to [Quality Monitoring Group → Quality Monitoring 1 & 2 pages]. Products that do not fulfill the above monitoring values are judged as deficient; if the number of deficient products in successive production exceeds the set value, the production is stopped, and an alarm is triggered.
- Product Number in Each Pack Batch：Set the batch number of each pack.
- Remain Number in Pack Batch to Suggestion：Set this value to N, and the alarm that reminds users for batch switching will be triggered when there are N times

of remaining shots before the current batch is to be finished.

The other information shown in this page also includes:

Mold Name：Set the document name of the current mold [For more relative settings, please go to Mold Document page].

Begin Production Time：Set the wait time to begin the production. The wait time starts to count when the [PD Start] function button at the lower right corner of the screen is pressed.

Estimation Production Time：Estimate production time is calculated by (Acceptable Product Required Number) × (Cycle Time)/ (Cavity Number Per Mold).

Remain Production Time：Remaining production time is calculated by (Acceptable Product Required Number- Actual Accept Product Number) × (Cycle Time)/ (Cavity Number Per Mold).

Estimation Materials Requirement：The estimate required raw materials for production is calculated by (Acceptable Product Required Number) × (Weight Per Mold).

Remain Materials Requirement：The estimate remaining raw materials required to complete production is calculated by (Accept Product Required Number- Actual Acceptable Product Number) × (Weight Per Mold).

Accept Products Required Quantity：When the [PD Start] function button at the screen's lower right corner is pressed and the defect-free product monitoring function is activated, this figure shows the total number of accept products by mold numbers that fit acceptable product condition x (Cavity Number Per Mold).

Deficient Products Quantity：When the [PD Start] function button at the screen's lower right corner is pressed and the deficient product monitoring function is activated, this figure shows the total number of deficient products by molding number that not fit acceptable product condition x (Cavity Number Per Mold).

Products Quantity：When the [PD Start] function button at the screen's lower right corner is pressed, this figure shows the total number of products by multiplying molding shots by (Cavity Per Mold).

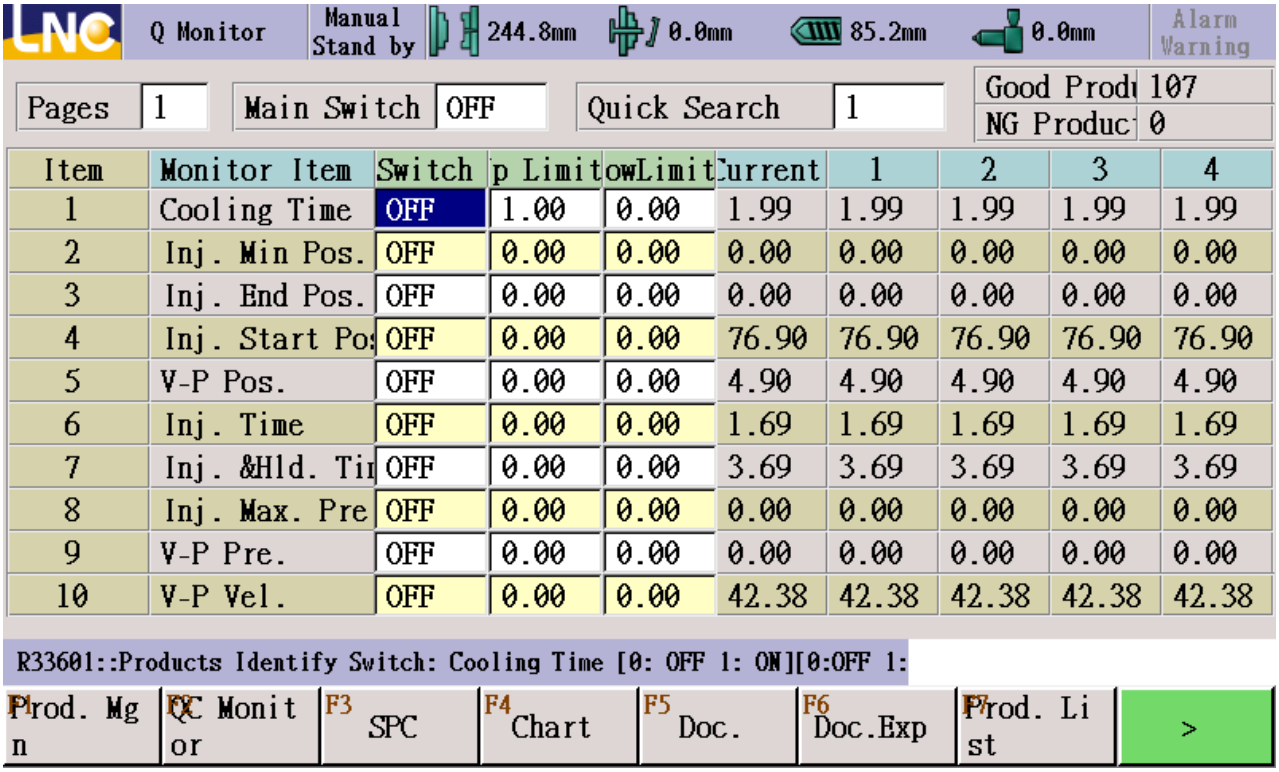
Products Approach Rate：Product Approach Rate: Press the [PD Start] function button at the screen's lower right corner and execute the defect-free product monitoring function, the percentage of defect-free products' actual number to the target number will be shown.

Accept Products Quantity of Batch：This figure shows the current number of acceptable products in this batch production.

Deficient Products Quantity of Batch：This figure shows the current number of deficient products in this batch production.

【Quality Monitor】

This page is to monitor production read to help judge accept goods and NG goods.



The settings include:

- Quality Monitor Main Switch：Set if to turn on monitoring function. When the main switch is set to ON, the commands below that are set to ON will carry out pass/fail product identification.
- Quick Locate to：The most recent 1000 shots of molding record are shown next to each production condition. With “Quick Locate to” function, users are allowed to check a specific molding record by inputting the designated record number.

  Furthermore, users can go to the last or next page by clicking 

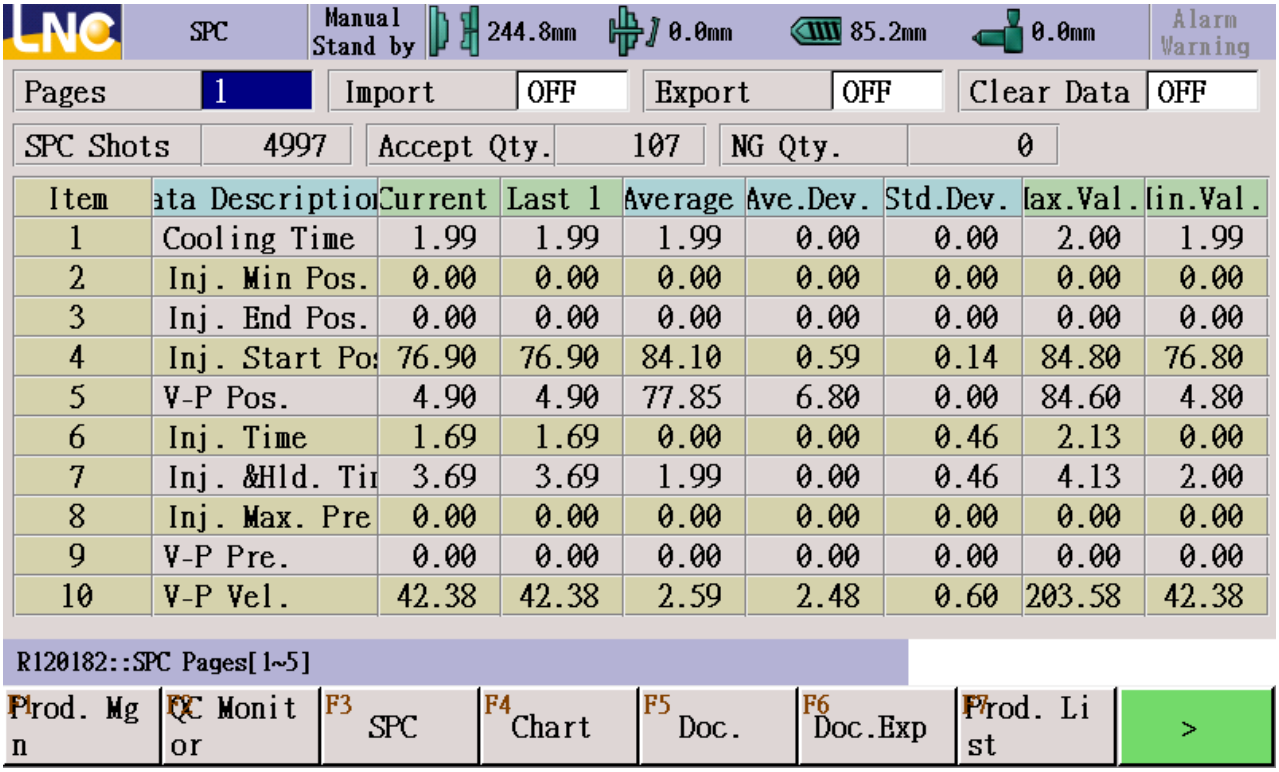
or 

.
- Quality Monitor Switch：Set if to turn on monitoring function for some production condition. Production data value of a molded item that locates between the upper and lower limits is identified as acceptable; if the value exceeds the upper or below the lower limits, the item is identified as defective.
- Up Limit：Set the upper limit value of each monitoring items.
- Low Limit：Set the lower limit value of each monitoring items.

  If some mold is replaced or parameters are reset, click Data Clear button to clear the previous data to reset all values to zero.

【SPC】

This page provides the production information of quality-relative statistics.



This page provides the production statistics and its calculation result during the production process for users to keep in track with the production status. The information includes:

Current Shot：The production information of the current shot.

Last 1 Shot：The production information of the last shot.

Last 2 Shot：The production information of the last two shots.

Average Value：The average of all production values from the initial to the last shot.

Average Deviation：Average deviation of all production values from the initial to the last shot.

Standard Deviation：In repeated production, the standard deviation of the measure values shows the precision level of the measurement.

Average Error：The value of average error of all production values from the initial to the last shot.

Standard Error：The value of standard error of all production values from the initial to the last shot.

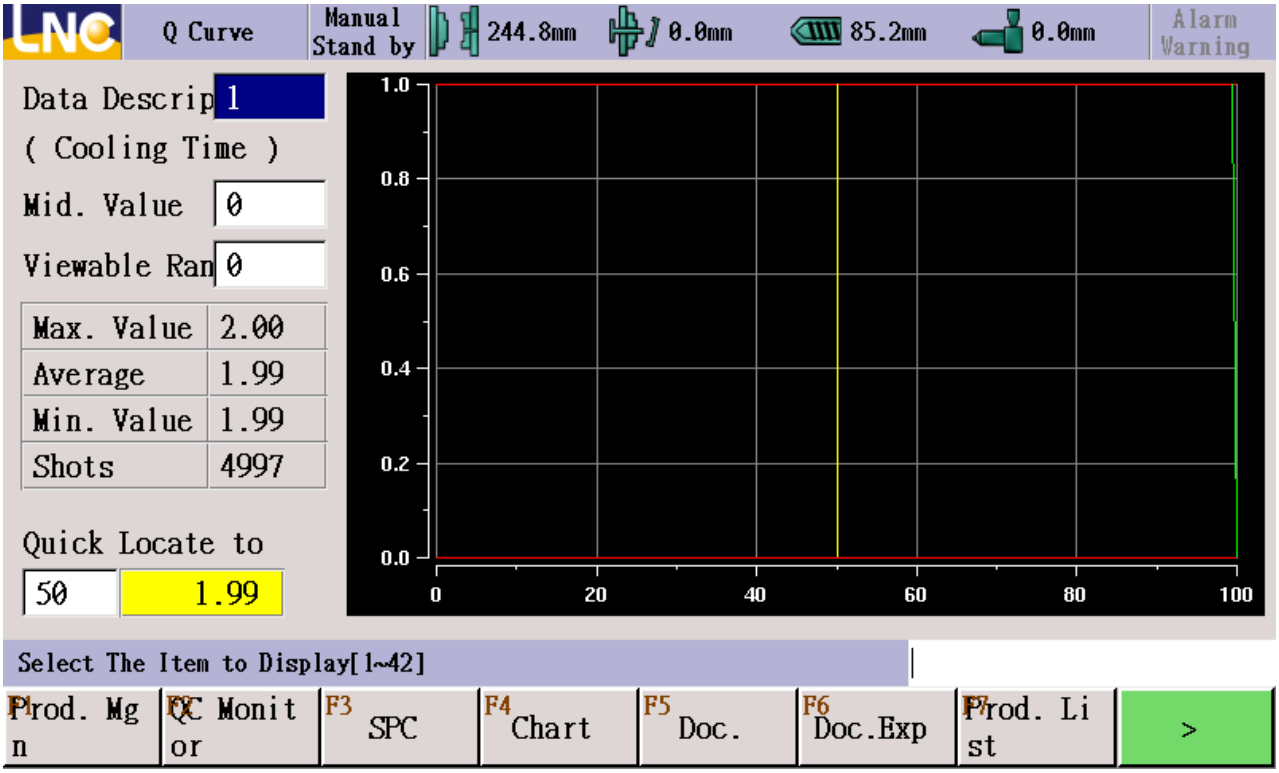
Max. Value：The maximum value of the production values from the initial to the last shot.

Min. Value：The minimum value of the production values from the initial to the last shot.

Clear Data：After changing mold or reset parameter, make this item to be ON to clear data and make everything to be zero.

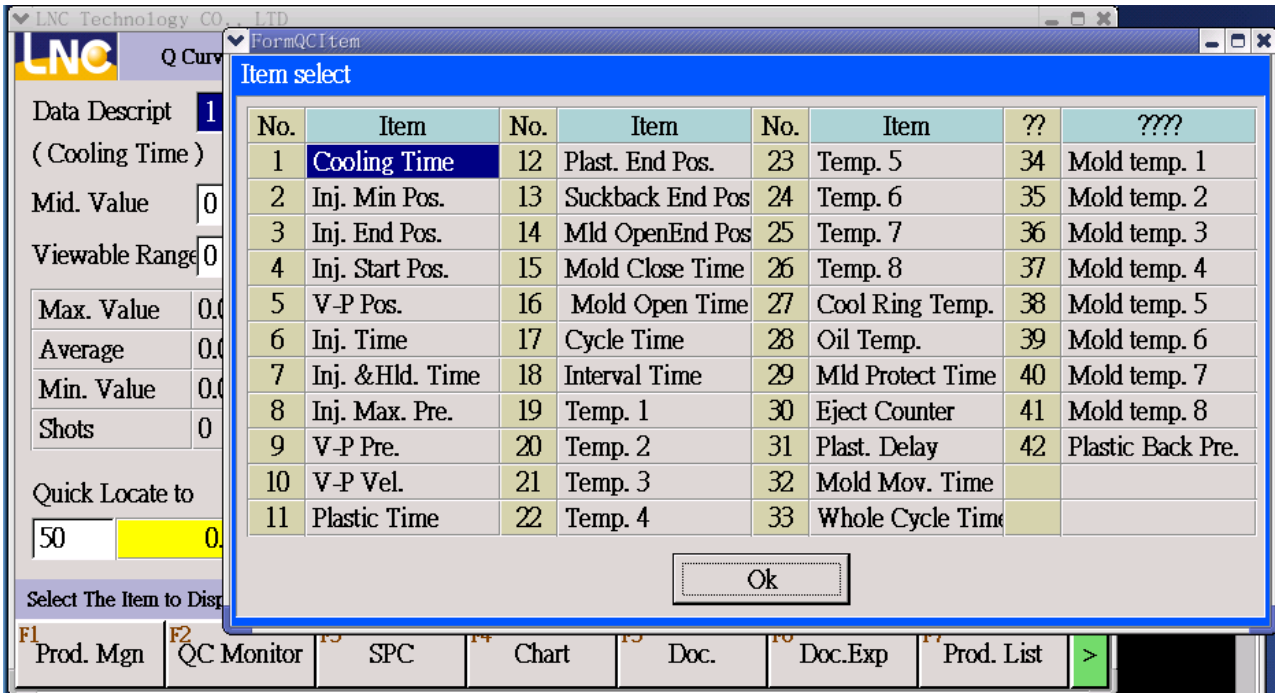
【Quality Curve】

This page shows the information during production process by curves.



The setting items include:

- Mid Value：Set the value of the center line accompanied with the control limit. The curve is only shown in the assigned range defined by [mid value ± control limit]. To make it easy for observation, users can set the mid value close to the mean, and set the control limit close to the standard deviation.
- Viewable Range：Set the viewable range in the curve diagram. Please refer to the description of “mid value” setting.
- Quick Locate to：Viewable curve page records the most recent 100 molding records. Users can switch to the molding record by Quick Locate to; as doing so, the cursor on the curve diagram will also move to the assigned molding record.
- Monitor Item：

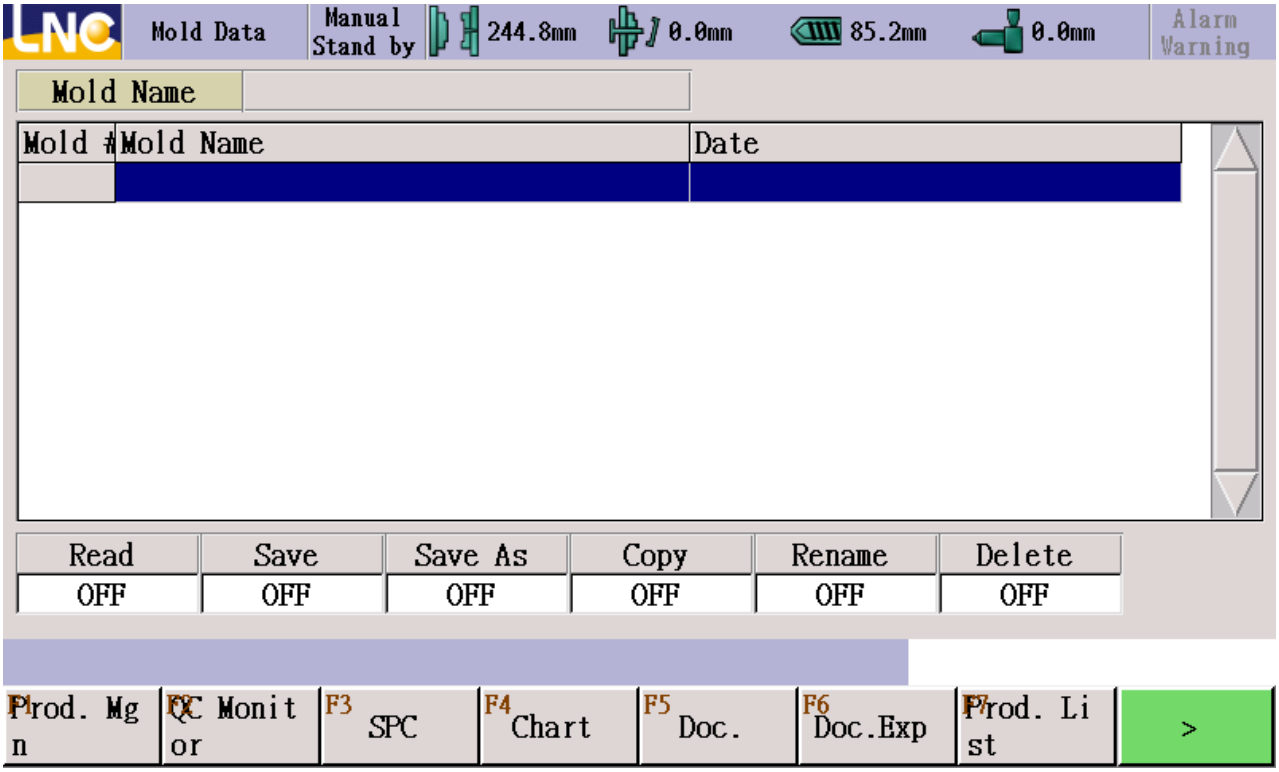


No.	Item	No.	Item	No.	Item	??	????
1	Cooling Time	12	Plast. End Pos.	23	Temp. 5	34	Mold temp. 1
2	Inj. Min Pos.	13	Suckback End Pos	24	Temp. 6	35	Mold temp. 2
3	Inj. End Pos.	14	Mld OpenEnd Pos	25	Temp. 7	36	Mold temp. 3
4	Inj. Start Pos.	15	Mold Close Time	26	Temp. 8	37	Mold temp. 4
5	V-P Pos.	16	Mold Open Time	27	Cool Ring Temp.	38	Mold temp. 5
6	Inj. Time	17	Cycle Time	28	Oil Temp.	39	Mold temp. 6
7	Inj. &Hld. Time	18	Interval Time	29	Mld Protect Time	40	Mold temp. 7
8	Inj. Max. Pre.	19	Temp. 1	30	Eject Counter	41	Mold temp. 8
9	V-P Pre.	20	Temp. 2	31	Plast. Delay	42	Plastic Back Pre.
10	V-P Vel.	21	Temp. 3	32	Mold Mov. Time		
11	Plastic Time	22	Temp. 4	33	Whole Cycle Time		

In Monitor Item, press ↵ and the above dialog box pops up, then move cursor to select the designated item for sampling. After selection is completed, the screen will show the production data curve of the selected item.

[Mold Data]

This group is to do mold document read/save/copy/rename/import/export.



Read：Use  to select mold name, press  to read this file.

Save：Use cursor to move to ON/OFF to save current file.

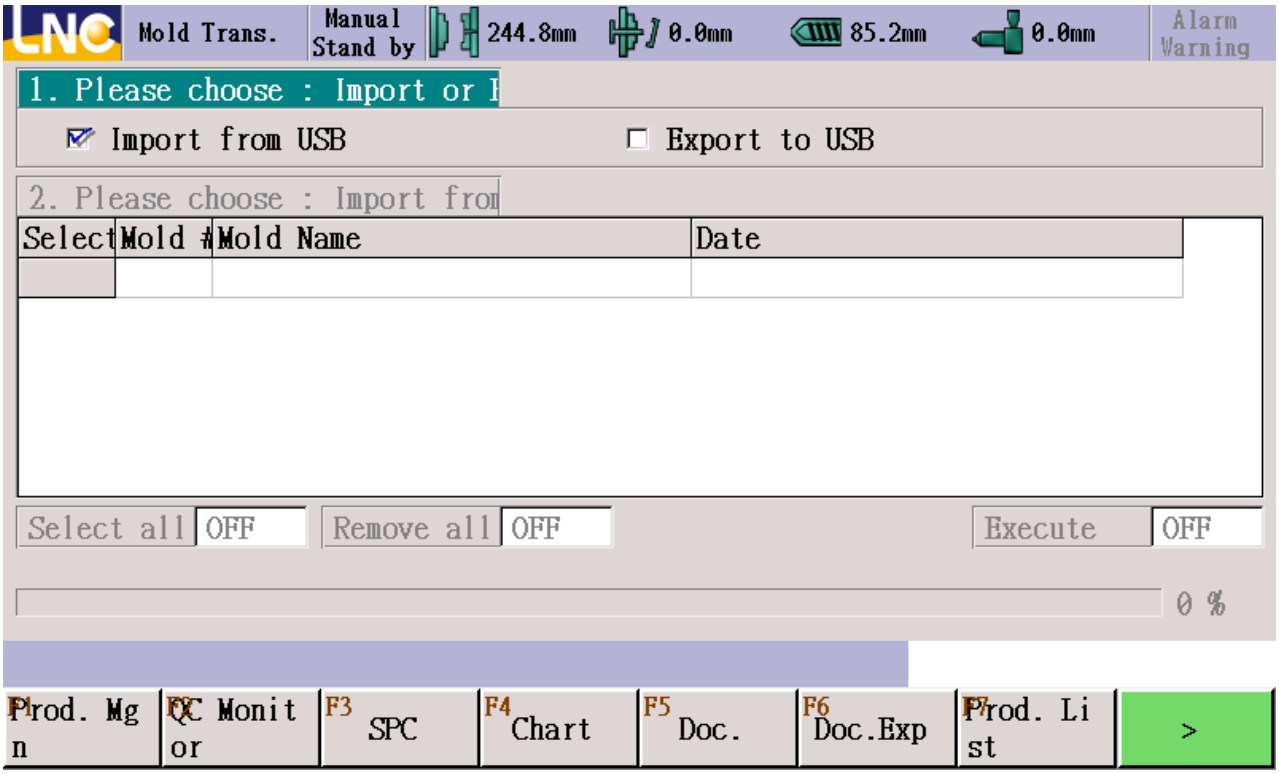
Save As：Use cursor to move to ON/OFF to save the current mold document as another file with a new file name. When set a new file name, the saving date is automatically recorded.

Copy：Choose the file that you want to copy and press ON/OFF to copy.

Rename：Choose the file that you want to change name.

Delete：Choose file that you want to delete, press ON/OFF to delete.

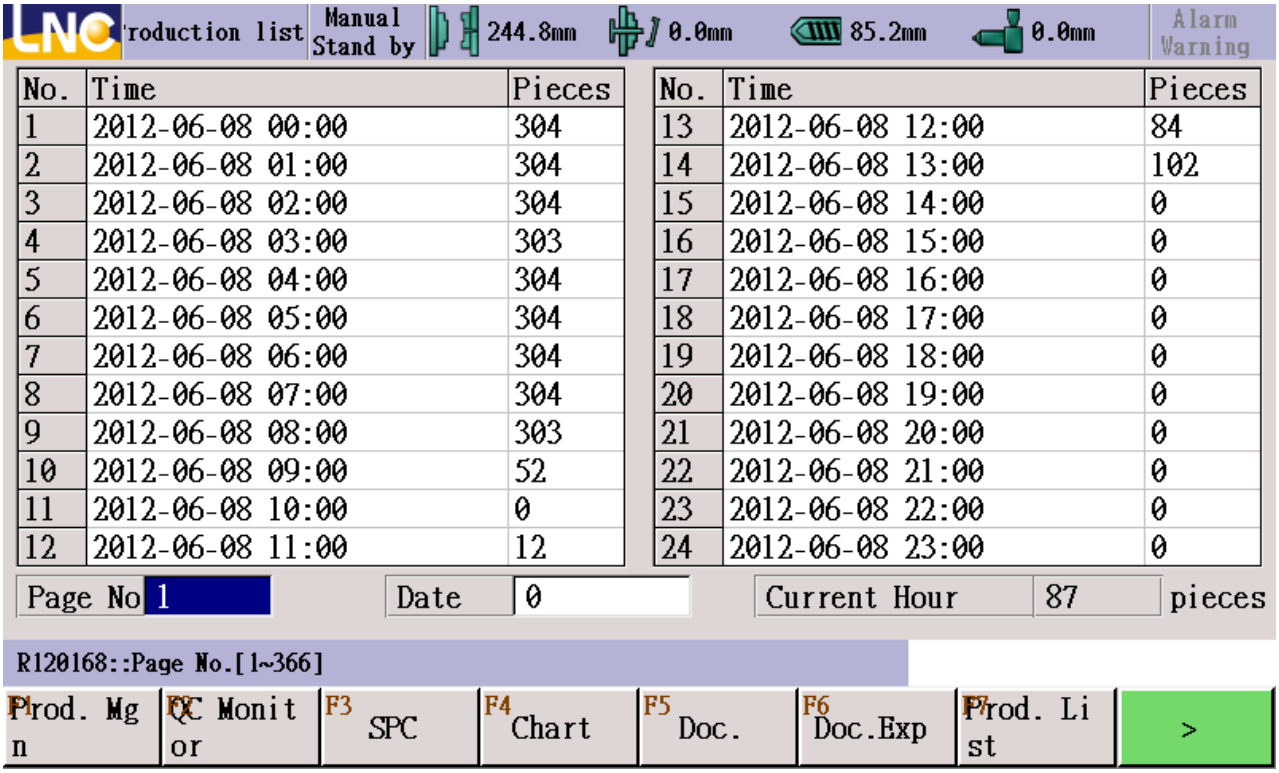
【Import/export】



<Import or export mold document >

- Import：Insert USB into USB socket, choose import from USB, select document, press **execute** to start.
- Export：Insert USB into USB socket, choose export to USB, select document, press **execute** to start.

【Production List 】

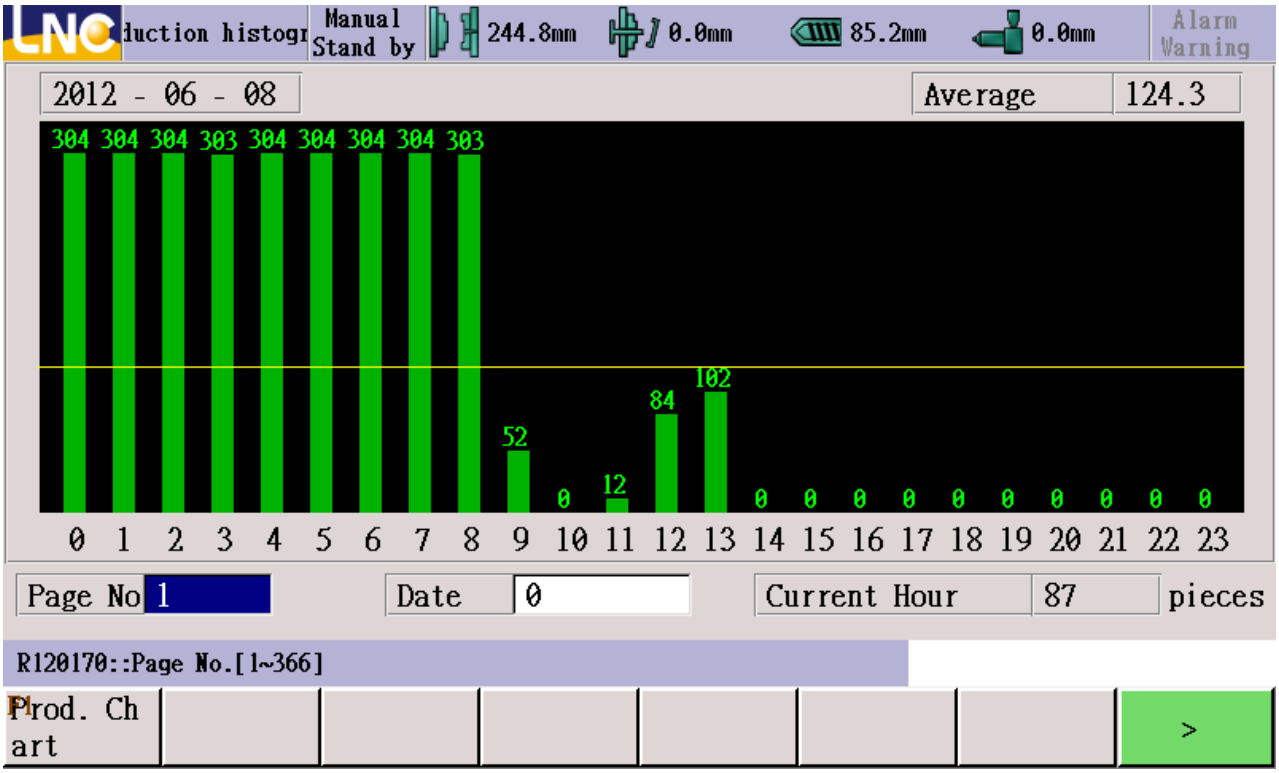


No.	Time	Pieces
1	2012-06-08 00:00	304
2	2012-06-08 01:00	304
3	2012-06-08 02:00	304
4	2012-06-08 03:00	303
5	2012-06-08 04:00	304
6	2012-06-08 05:00	304
7	2012-06-08 06:00	304
8	2012-06-08 07:00	304
9	2012-06-08 08:00	303
10	2012-06-08 09:00	52
11	2012-06-08 10:00	0
12	2012-06-08 11:00	12

No.	Time	Pieces
13	2012-06-08 12:00	84
14	2012-06-08 13:00	102
15	2012-06-08 14:00	0
16	2012-06-08 15:00	0
17	2012-06-08 16:00	0
18	2012-06-08 17:00	0
19	2012-06-08 18:00	0
20	2012-06-08 19:00	0
21	2012-06-08 20:00	0
22	2012-06-08 21:00	0
23	2012-06-08 22:00	0
24	2012-06-08 23:00	0

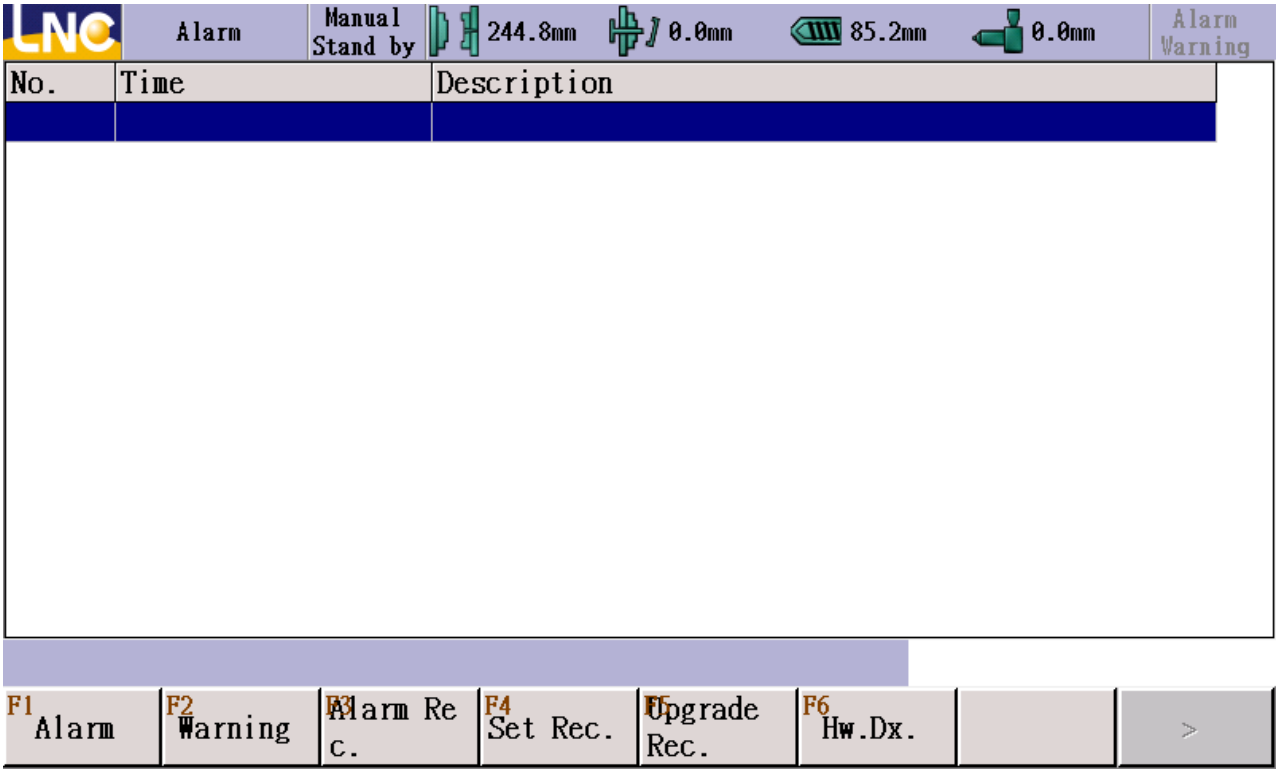
This list can list out production/hour for 365 days.

【Production Chart】



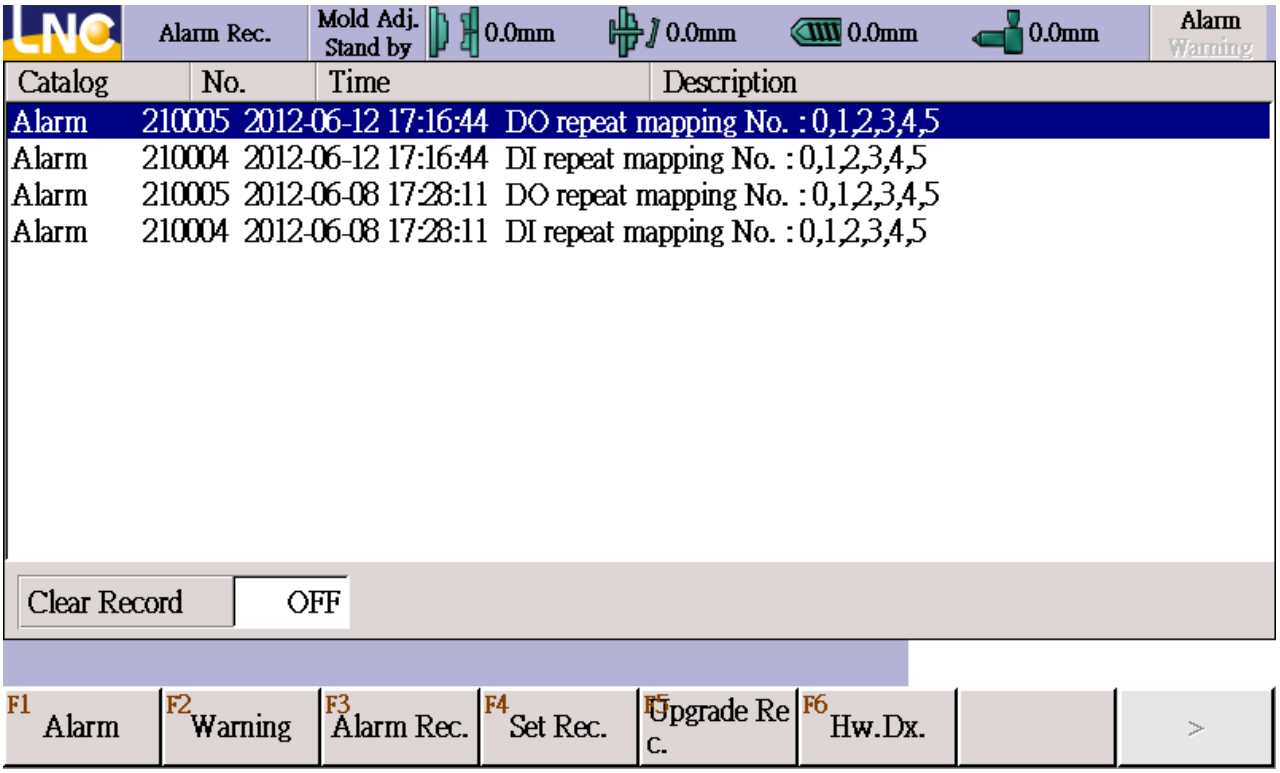
4.6 Diagnosis

【Current alarm】 <show current alarm>



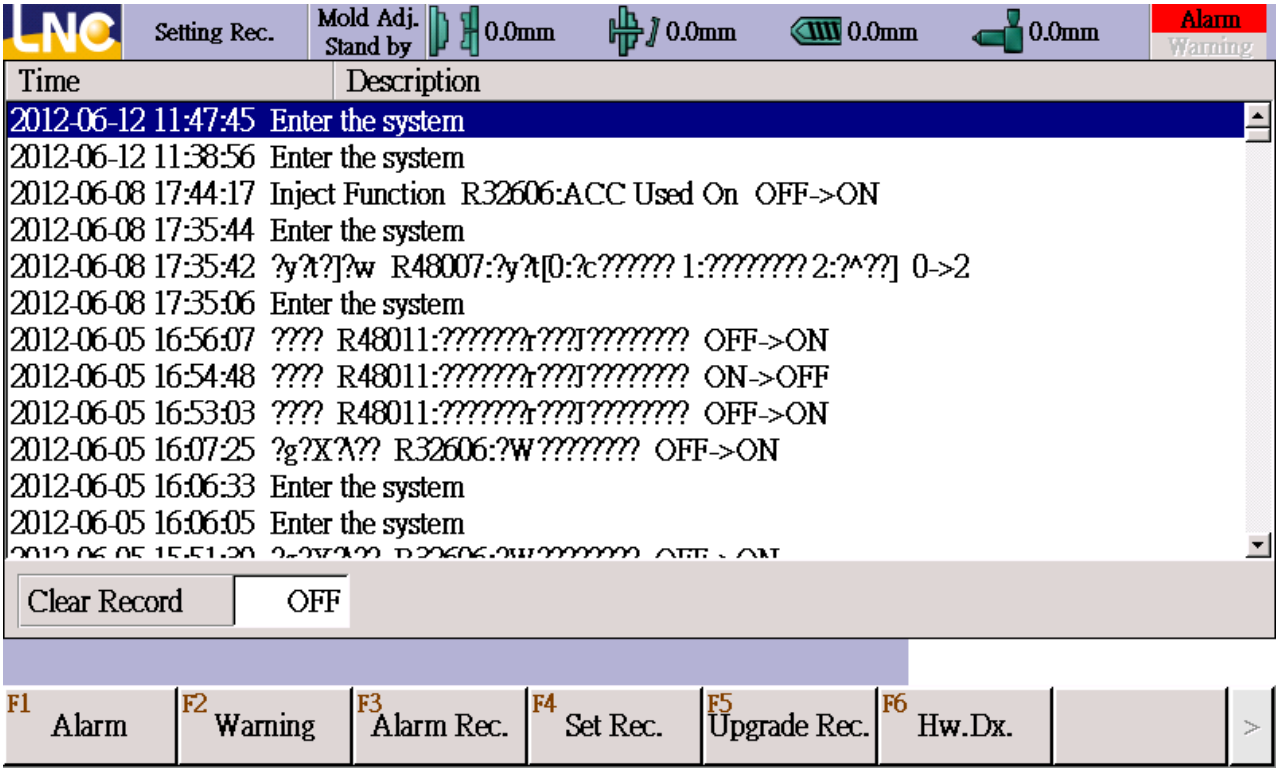
- No.：Number of alarm or warning.
- Time：Time of alarm or warning.
- Description：Alarm or warning content.

【Alarm record】 <show warning record>

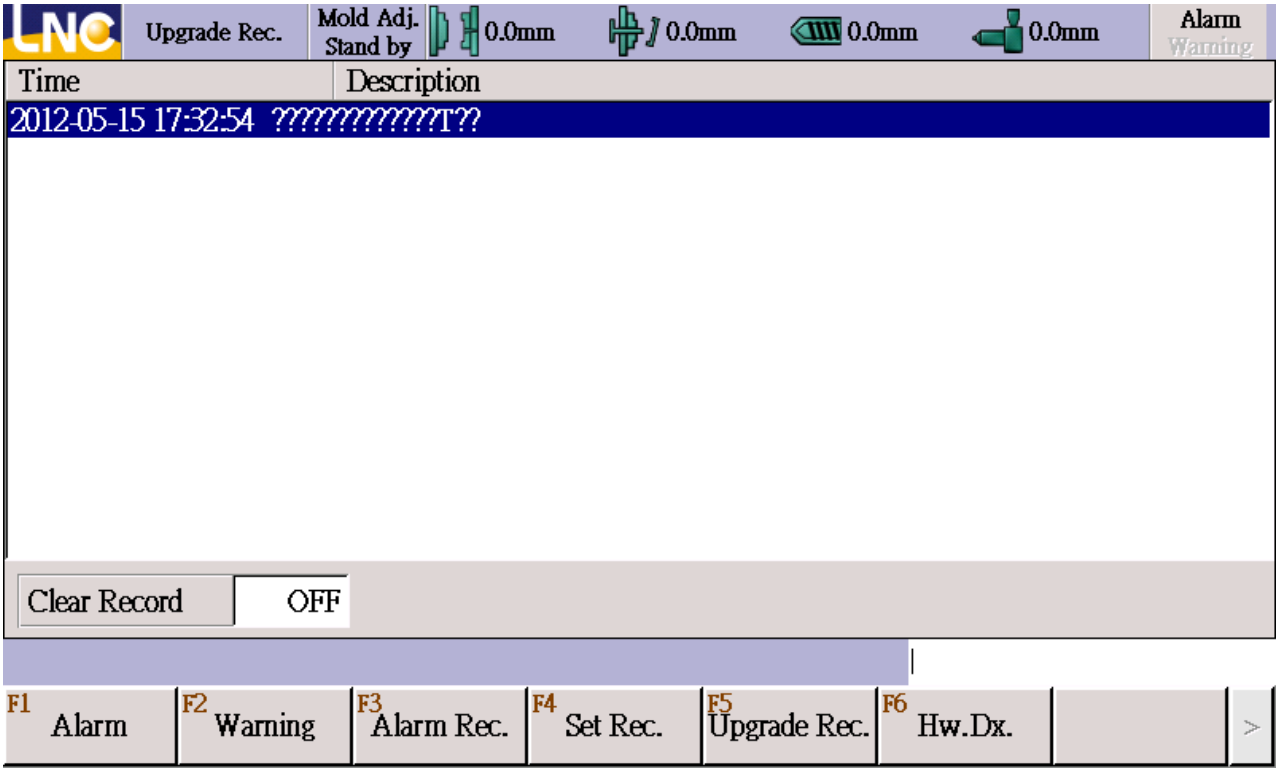


- Type：Record by different types
- No.：Number of the record.
- Time：Time of record.
- Description：Show record content.

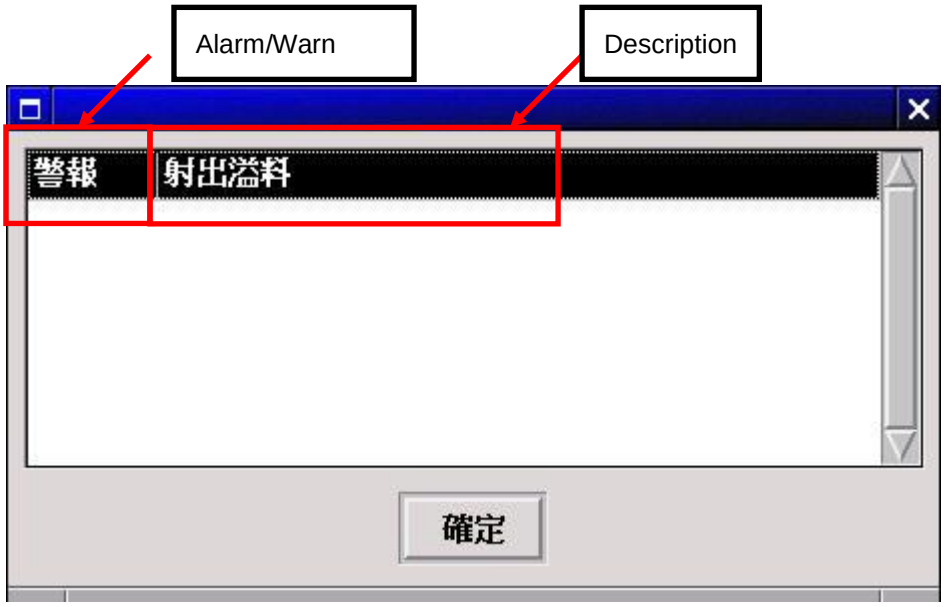
【Setting Record】 This is the history of setting record, users can check here to know setting problem.



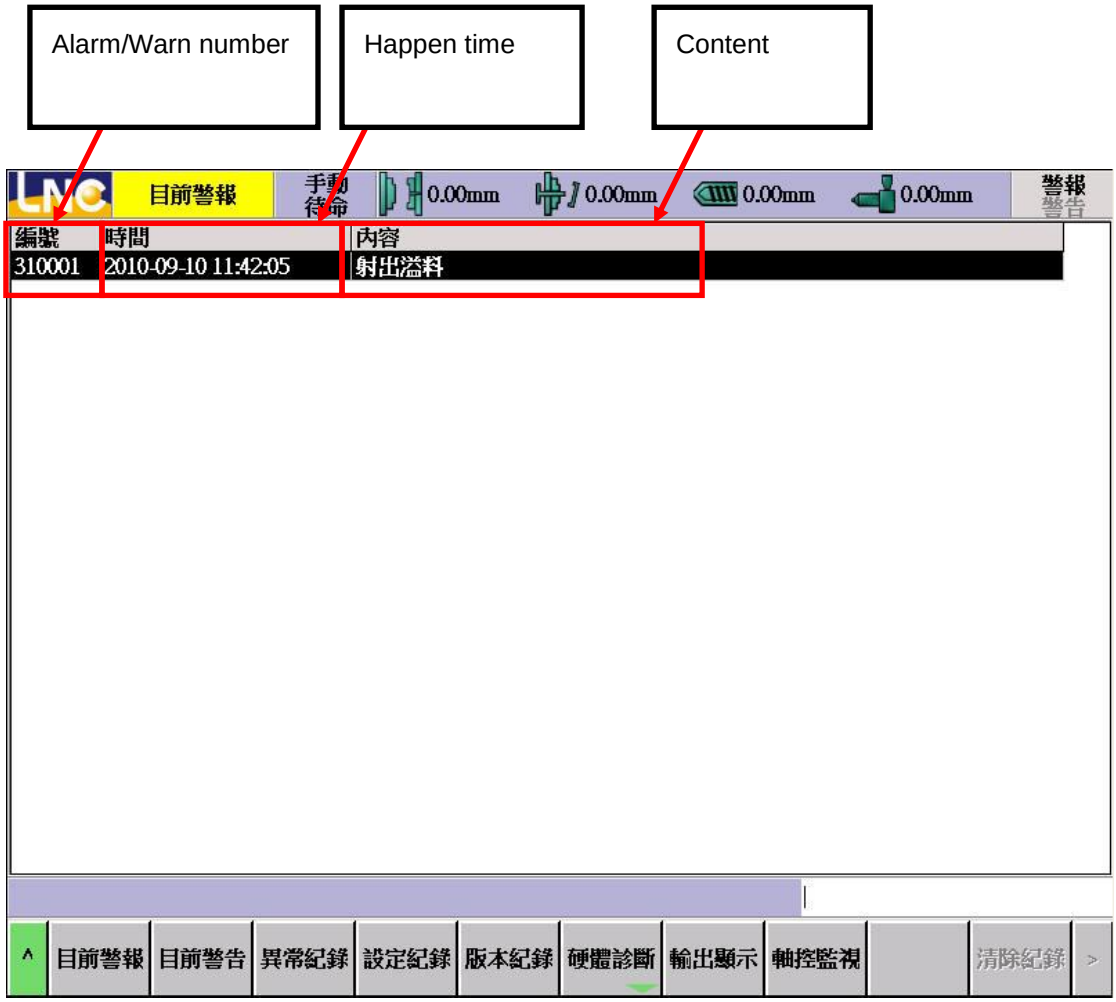
【Upgrade Record】 This is the history of version update, users can check here to know update version and times.



5 Alarm/Warning



If you want to check all alarm/warn content, please switch to page alarm or warn, as below.



Description：

3	1	0001
1: PLC Module 2: HMI Module 3: OP Module 4: MOT Module	1: Alarm 2: Warn	Number for alarm or warn

6 OP Alarm

310001	Injection Overflow

Reason: After injection pressure holding ended, screw position is smaller than (injection overflow inspection position).

Solution: 1. Confirm if there is overflow situation during injection.

2. Adjust parameter (injection overflow inspection position) (R31256)

Note: owing to production safety reason, the alarm will be set to activate after the mold production have been completed.

310002	Injection parameter setting error

Reason: Incorrect setting of injection related parameter.

Solution: 1. Error could be caused by related procedure.

2. Please contact our personnel concerned or the machine supplier.

310003	Injection action time exceed monitor time

Reason: Injection action time exceed monitor time, but did not change to hold or End procedure.

Solution:1.Confirm if the nozzle is blocked.

2. Adjust injection monitor time (R31200).

3. Check if the practical injection pressure flow output is normal.

4. Check if related valves are jammed.

310005	Insufficient injection

Reason: After injection pressure holding ended, screw position is larger than (injection insufficient inspection position).

Solution:1.Confirm if the nozzle is blocked.

2. Adjust injection insufficient inspection position (R31257).

Note: owing to production safety reason, the alarm will be set to activate after the mold production have been completed.

310006	Injection potentiometer did not return to Home

Reason: Before returning to Home, the optical or magnetic linear encoder as the injection position p~~o~~otentiometer made injection action.

Solution: 1. If Injection position potentiometer is using potentiometer, adjust the input mode of injection potentiometer position (R32824) to potentiometer.

2. If injection potentiometer is using optical or magnetic linear encoder, please reset injection to zero before making manual injection.

310032	Plasticizing action exceeding monitor time

Reason: Plasticizing action time exceeding the time (plasticizing monitor time).
Solution: 1. Confirm if plasticizing action is normal.
2. Adjust plasticizing monitor time (R31405).

310033	Plasticizing parameter setting error

Reason: Incorrect setting of plasticizing parameter.
Solution: 1. Error could be caused by related procedure.
2. Please contact our personnel concerned or the machine supplier.

310064	Front Suckback action time exceed monitor time

Reason: Front Suckback action time exceed time (Front Suckback monitor time).
Solution: 1. Please adjust Front Suckback monitor time as according to practical requirement. (R31404)
2. Check if Front Suckback practical pressure flow output is normal.
3. Check if related valves are jammed.

310096	Rear Suckback action time exceed monitor time

Reason: Rear Suckback action time exceed time (Rear Suckback monitor time).
Solution: 1. Please adjust Rear Suckback monitor time as according to practical requirement. (R31418)
2. Check if Rear Suckback practical pressure flow output is normal.
3. Check if related valves are jammed.

310097	Suckback parameter setting error

Reason: Incorrect setting of Suckback parameter.
Solution: 1. Error could be caused by related procedure.
2. Please contact our personnel concerned or the machine supplier.

310098	Enforce Suckback function should be shut off.

Reason: Under (semi) auto mode: prior injection inspection can help confirm shutting off of Enforce Suckback function.
Solution: 1. If not in use (Enforce Suckback function), please shut off the parameter R(31356) , this can prevent any wrong action to halt normal production.

310128	Nozzle Forward action time exceed monitor time

Reason: Nozzle forward action exceeds time (unit forward monitor time).

Solution: 1. The protection time can be adjusted to suitable values through parameter R (31616) (Total monitor time of injection unit forward).

2. Check if the practical pressure flow output of Nozzle Forward is normal.

3. Check if related valves are jammed.

310131	Injection unit forward parameter setting error

Reason: Incorrect setting of injection unit forward parameter

Solution: 1. Error could be caused by related procedure.

2. Please contact our personnel concerned or the machine supplier.

310160	Injection unit backward action time exceed monitor time

Reason: Injection unit backward action exceeds time (injection unit backward monitor time).

Solution: 1. The protection time can be adjusted to suitable values through parameter R (31617) (Total monitor time of injection unit backward).

2. Check if the practical pressure flow output of Nozzle Backward is normal.

3. Check if related valves are jammed.

310163	Injection unit backward parameter setting error

Reason: Incorrect setting of injection unit backward parameter.

Solution: 1. Error could be caused by related procedure.

2. Please contact our personnel concerned or the machine supplier.

310194	Low pressure mold close action time exceed monitor time

Reason: When the mold clamping stroke enters into low pressure mold clamping, the action time is exceeded (over the protection time of low pressure mold clamping) and incurring not entering into high pressure mold closing.

Solution: 1. Check if there is any foreign matter inside the mold.

2. If there is no foreign matter, please compare the practical position and check if it is smaller than low pressure mold close entrance position, there is a possibility that mold adjusting mold adjusting is not proceeded after replacement.

3. The protection time can be adjusted to suitable values through parameter R (30010) (low pressure mold clamping monitor time).

4. Check at the moment of mold clamping , if the actual output flow of low pressure

is normal.

5. Check if related valves are jammed.

310195	High pressure mold closing action time exceed monitor time.

Reason: When the mold clamping stroke is under high pressure mold closing mode, the action time exceed (high pressure mold close protection time).

Solution: 1. Check if there is any foreign matter inside the mold..

2. Confirm if the pressure flow is normal during high pressure mold closing
3. The protection time can be adjusted to suitable values through parameter R (30013) (high pressure mold closing monitor time).
4. Check, at the moment of mold clamping, if the actual output flow of low pressure is normal.
5. Check if related valves are jammed.
6. If R (30118) (mold clamping confirmation method) select 0: signal, then please check if (mold clamping force reached) signal is ON.
7. If R (30118) (mold clamping confirmation method) select 1: pressure, then please check if pressure sensor is OK.
8. Check if mold clamping force is higher than R (30014) (sensor value of mold cylinder after completing high pressure mold clamping).
9. If R (30118) (molding clamping confirmation method) select 2: position, then please check if the position of mold potentiometer is normal.

310196	Mold clamping parameter setting error

Reason: Incorrect setting of mold clamping parameter.

Solution: 1. Error could be caused by related procedure.

2. Please contact our personnel concerned or the machine supplier.

310197	Clamping time exceed monitor time

Reason: The whole clamping time exceed time (mold clamping monitor time).

Solution: 1. The protection time can be adjusted to suitable values through parameter R (30015) (mold clamping monitor time).

2. Check, at the moment of mold clamping, if the actual output pressure flow is normal.
3. Check if related valves are jammed.
4. If R (30118) (mold clamping confirmation method) select 0: signal, then please check if (mold clamping force reached) signal is ON.

5. If R (30118) (mold clamping confirmation method) select 1: pressure, then please check if pressure sensor is OK.
6. Check if mold clamping force is higher than R (30014) (sensor value of mold cylinder after completing high pressure mold clamping).
7. If R (30118) (mold clamping confirmation method) select 2: position, then please check if the position of mold potentiometer is normal.

310198	Mold cylinder reaches limit position

Reason: Trigger “Mold cylinder reaches limit input signal”, the alarm is used to protect the mold cylinder position from exceeding stroke.

Solution: 1. Confirm if the mold cylinder position is normal.

2. Confirm if “Mold cylinder reaches limit input signal” is triggered or improperly installed.
3. Confirm if related hardware equipment is normal (power distribution, wiring, proper terminals connection or A/B type etc).

310227	Mold open action time exceed monitor time

Reason: Mold open action time exceeds monitor time (Mold open monitor time)

Solution: 1. The protection time can be adjusted to suitable values through parameter R (30033) (mold open monitor time).

2. Check, at the moment of mold open, if the actual pressure flow output is normal.
3. Check if related valves are jammed.
4. Please check if the position of mold potentiometer is normal.

310228	Mold open parameter setting error

Reason: Incorrect setting of mold open parameter.

Solution: 1. Error could be caused by related procedure.

2. Please contact our personnel concerned or the machine supplier.

310256	Ejector forward action time exceed Monitor Time

Reason: During ejector forward, the action time exceeds over the monitor time for advancing of ejector.

Solution: 1. The protection time can be adjusted to suitable values through parameter R (30220) (ejector forward Monitor Time).

2. Check if the ejector practical pressure flow output is normal.
3. Check if related valves are jammed.
4. If R(30200) (sensor setting of ejector cylinder position) select 0: potentiometer,

then please check if the position of ejector cylinder potentiometer is normal.

5. If R (30220) (sensor setting of ejector cylinder position) select 1: Limit switch or 2: Limit switch and time, then please check if the stop signal for ejection is normal.

310257	Ejector forward parameter setting error

Reason: Incorrect setting of Ejector forward parameter.

Solution: 1. Error could be caused by related procedure.

2. Please contact our personnel concerned or the machine supplier.

310258	During production, non-good parts will forbid the Ejector from moving.

Reason: Under (semi) automatic mode, before final ejection, if “non-good parts appear during production” and “defective product forbids ejection from activating” function is ON, the alarm will be activated.

Solution: The inspection is activated through parameter R (30259) (forbid ejection of non-good parts).

310259	Forbid Ejector action on mold clamping completion

Reason: If mold clamping is completed, manual performing of ejector forward will activate the alarm.

Solution: Under (semi) automatic mode, this action is process-controlled, the alarm usually work under manual mode operation to prevent any careless operation.

310288	Ejector backward action time exceed Monitor Time

Reason: During ejection backward, the action time exceeds over the monitor time for ejection backward.

Solution: 1. The protection time can be adjusted to suitable values through parameter R (30219) (ejector backward Monitor Time).

2. Check if the ejector backward practical pressure flow output is normal.
3. Check if related valves are jammed.
4. If R (30200) (sensor setting of ejector cylinder position) select 0: potentiometer, then please check if the position of ejector cylinder potentiometer is normal.
5. 5. If R (30220) (sensor setting of ejector cylinder position) select 1: Limit switch or 2: Limit switch and time, then please check if the stop signal for ejection is normal.

310289	Ejector backward parameter setting error

Reason: Incorrect setting of Ejector backward parameter.

Solutions: 1. This warning does not show often. In case of warning happens, it could be caused by related procedure.

2. Please contact our personnel concerned or the machine supplier.

310320	Barrel temperature exceeds the limits of set values.

Note: When it comes to "exceeds the limits of set values ", it means that the temperature may higher than the upper limit of set values, or lower than the lower limit of set values.

Reason: Temperature checks are proceeded automatically before all screw actions (Injection, Suckback, Feeding..). Possible causes are as follows:

1. (Cold start monitoring function) is turned ON, while "the temperature has not yet reached the set value at the first cold start."
2. Item 1 is satisfied, but it is not yet the (Cold start delay time).
3. Temperature goes beyond the upper or lower limit of safe set values.

Solutions: 1. While turning on (Cold start monitoring function) (Parameter R (32131 ~ 32137, temperature control section x, Cold start temperature monitoring function switch)), make sure that all sections had reach the target temperatures.

2. When the alarm is activated, check the temperatures of all sections. Upper and lower limits (parameter R (32024 ~ 32030) of over-high temperature alarm, or parameter R (32036 ~ 32042) of over-low temperature alarm) of all sections' target temperatures are adjustable.
3. Adjust appropriate cold start delay time (parameter R (32052))

310321	Thermocouple break

Reason: The alarm will be triggered when temperature control sections do not match those of hardware. For instance, alarm will be triggered as temperature control sections are set to 1, 2, and 3, while those of thermocouple are only connected to 1 and 2.

Solutions: 1. Make sure that temperature control sections match those of hardware. (Parameter R (32056), temperature control sections used.)

2. Standby temperature control sections must be short-circuited.

310322	Heating wire break

Reason: Alarm will be activated as the heater is turned ON while the temperature does not reach the set value during inspection time. In this case, the heater is considered as not

functioning normally. *(This alarm will force the heater to be shut down).*

Solutions: 1. Set appropriate check time (Parameter R (32152) [heating wire break detector], check time) and check temperature (parameter R (32153) [heating wire break detector], check temperature rise).

2. Please check related hardware configuration and status (whether the controller output and SSR / SCR are functioning normally and whether the wiring is connected correctly ...).

310323	Barrel temperature exceeds safety temperature

Reason: Alarm will be activated as the barrel temperature exceeds the temperature limit. *(This alarm will force the heater to be shut down).*

Solutions: 1. Make sure that barrel temperature does not exceed the temperature limit. In case that it goes beyond that limit, check related hardware configuration and status (whether the controller output or SSR / SCR are functioning normally and whether the wiring is connected correctly ...).

2. Adjust appropriate temperature limit values (parameter R(32054) temperature limit values).

310324	Temperature is too high to be adjusted automatically.

Reason: Barrel temperature is too high for automatic temperature adjustment to function normally.

Solution: 1. Before proceeding to temperature adjustment, make sure that temperatures of all sections are lower than adjusting value by at least 50°C.

310325	Heater is not turned on.

Reason: Heater is not turned on, such that automatic temperature adjustment cannot function normally.

Solution: 1. Turn on “Heater” function on the operation panel.

310326	Oil temperature exceeds limits of set values.

Reason: For safety reasons, alarm will be activated as the oil tank temperature is higher than the upper limit of set values or lower than the lower limit of set values for 10 seconds.

Solutions:1. Make sure that oil temperature does exceed the limits of set values. If not, then please check related hardware configuration and status (for instance, wiring, sensors, etc.)

2. Make sure that the upper limit and lower limit of set values are appropriate

(parameter R (32033), upper limit values of oil tank over-high temperature alarm/ parameter R (32045), lower limit values of oil tank over-low temperature alarm).

310327	Temperature not reaching target value

Reason: Alarm will be activated as the machine is switched to ((semi-) automatic) production mode while the temperature is not yet reaching the target value.

Solution: 1. Please make sure that temperatures of all sections are in the range of set values of target temperature.

310328	Temperature reading is abnormal.

Reason: For safety reasons, *this alarm will force the heater to be shut down* in order to protect controller hardware.

Solutions: 1. Restart controller.

2. In case that the alarm is activated frequently or unexpectedly, contact your machine supplier (or ask them to contact the personnel of controller's supplier) for further solutions.

310329	Thermocouple TC01 break
310330	Thermocouple TC02 break
310331	Thermocouple TC03 break
310332	Thermocouple TC04 break
310333	Thermocouple TC05 break
310334	Thermocouple TC06 break
310335	Thermocouple TC07 break
310336	Thermocouple TC08 break

Reasons: 1. The alarms are activated for the same reason as that of 31321. However, alarms 31329~31336 will directly pointed out at which temperature channel breaks.

2. Alarms differ according to software versions. Only one alarm mechanism is demonstrated in our case.

Solution: Refer to alarm 31321

310352	Mold transfer time exceeds the Monitor Time, or mold transfer sensor breakdown

Reasons: 1. A time range is set to limit the protection duration of the whole mold transfer stroke as mold transfer begins.

2. Mold transfer sensor breakdown” means that there is no mold displacement sensor feedback when the mold is reaching target position.

Solutions:1. The protection time can be adjusted to suitable values through parameter R (32217) (Mold transfer Monitor Time).

2. When a temporal control is used to control the mold transfer moment for reaching the target position, the Monitor Time (which can be set on the mold transfer screen) must be smaller than the action Monitor Times.
3. If a sensor is used to detect whether the mold transfer reaches the target position, and if item 1 cannot do that, then please check related hardware configuration and status (for instance, mold transfer stop sensors, wiring etc.)

Note: This alarm is to be activated only when the machine is equipped with mold transfer device.

310353	Locate Pin Forward time exceeds the Monitor Time, or positioning sensor breakdown

Reasons:1. A time range is set to limit the protection duration of the whole Locate Pin Forward stroke as the Locate Pin Forward operation is started.

2. “Positioning sensor breakdown” means that there is no positioning sensor feedback when Locate Pin Forward is reaching the target position.

Solutions:1. The protection time can be adjusted to suitable values through parameter R (32221) (Locate Pin Forward Monitor Time).

2. When a temporal control is used to control the Locate Pin Forward moment for reaching the target position, the Monitor Time (which can be set on the mold transfer screen) must be smaller than the action Monitor Times.
3. If a sensor is used to detect whether the Locate Pin Forward reaches the target position, and if item 1 cannot do that, then please check related hardware configuration and status (for instance, Locate Pin Forward stop sensors, wiring etc.)

Note: This alarm is to be activated only when the machine is equipped with Locate Pin device.

310354	Locate Pin Backward time exceeds the Monitor Time, or positioning sensor breakdown

Reasons:1. A time range is set to limit the protection duration of the whole Locate Pin Backward stroke as the Locate Pin Backward operation is started.

2. “Positioning sensor breakdown” means that there is no positioning sensor feedback when Locate Pin Backward device is reaching the target position.

Solutions:1. The protection time can be adjusted to suitable values through parameter R (32222) (Locate Pin Backward Monitor Time).

2. When a temporal control is used to control the Locate Pin Backward moment for reaching the target position, the Monitor Time (which can be set on the mold transfer screen) must be smaller than the action Monitor Times.

3. If a sensor is used to detect whether the Locate Pin Backward reaches the target position, and if item 1 cannot do that, then please check related hardware configuration and status (for instance, Locate Pin backward stop sensors, wiring etc.)

Note: This alarm is to be activated only when the machine is equipped with Locate Pin device.

310355	Mold cylinder does not reach the highest point.

Reason: It is a safety check before mold transfer. Alarm is activated if mold open does not reach the stop position.

Solutions: 1. If this alarm is activated under manual mode, mold transfer can be started only as the mold is completely opened.

2. If this alarm is activated under production mode, the operation must be repeated until the problem is solved. If not, contact your machine supplier for solutions.

310356	Mold transfer does not reach target position, or mold transfer sensor breakdown

Reasons:1. Mold transfer does not reach target position during ejection, mold clamping, or Locate Pin Forward.

2. “Mold transfer sensor breakdown” means that there is no mold transfer sensor feedback when the mold transfer is reaching the target position.

Solutions: 1. Set the mold transfer to the target position, and then start operations of Eject Forward, Mold clamping, or Locate Pin Forward.

Please check related hardware configuration (for instance, mold transfer stop sensors, wiring etc.)

Note: This alarm is to be activated only when the machine is equipped with mold transfer device.

310357	Ejector does not reach target position

Reason: Ejector does not reach target position during mold clamping or mold transfer.
Solutions: 1. Move the Ejector to the target position, and then start operations of mold clamping or mold transfer.
2. Please check related hardware equipments and status (for instance, ejector backward stop sensors, power distribution, wiring, proper terminals connection or A / B contact etc.)

310358	MOLD TRANSFER parameter setting error mold

Reason: Incorrect setting of MOLD TRANSFER parameter
Solutions: 1. Error could be caused by related procedure.
2. Please contact our personnel concerned or the machine supplier.

310384	Safety door or side safety door is not closed.

Reason: During mold clamping or mold transfer (depending on the version in use), or during production or mold open (according to parameters R (33801), the alarm activates if safety door is not closed) the safety door or the side safety door is not closed.
Solutions: 1. Make sure the safety door and side door are closed.
2. This is a hardware input signal. If it isn't functioning normally, please check if the related hardware equipment is normal (power distribution, wiring, proper terminals connection or A / B contact etc.)

310385	The liquid level is too low in the oil tank

Reason: Too low liquid level in the tank is an input signal, and the input signal is triggered.
Solution: Check the hardware input signal. If it isn't functioning normally, please check if the related hardware equipment is normal (power distribution, wiring, proper terminals connection or A / B contact, etc.)

310386	Motor is not started.

Reason: The motor is not started before switching to semi or fully automatic mode, or performing any actions.
Solution: Press the motor start button on the control panel to start the motor.

310387	The motor starting is not completed yet.

Reason: The mechanism generally goes with a confirmation signal for starting the motor (input signal) as the detection method. The alarm will be activated, if the confirmation signal is not triggered when switching to semi or fully automatic mode or performing any

actions.

Solution: This is a hardware input signal. If it isn't functioning normally, please check if the related hardware equipment is normal (power distribution, wiring, proper terminals connection or A / B contact, etc.)

310388	The emergency button has been pressed.

Reasons: 1. It is a mechanism for emergency safety protection. At any time, pressing the emergency button (emergency stop) will trigger the alarm and stop all machine operation

2. Upon emergency stop, you may refer to the parameter (R (32675), emergency stop for mode open action) to decide whether to open the mold.

Solutions: 1. It is a mechanism for emergency safety protection. Just to reset the emergency button after handled the emergency.

2. Please note that the emergency button (emergency stop) has A / B contact for distinction. Refer to parameter (R (32683), emergency stop button [0: A Contact 1: B contact]) to adjust, and avoid activating this alarm though the emergency button is not pressed.

310389	A signal enters the light curtain

Reasons: 1. The parameter R (32655) light curtain protection switch is turned ON.

2. During mold clamping or mold transfer (refer to parameter R (32657) mold transfer light curtain protection switch, to decide whether to check it or not) a signal enters the light curtain.

Description: At the moment of mold clamping, refer to the parameter R (32676) to decide whether to unclamp the mold. This function will vary with the version used.

Solutions: 1. Just to reset the state (Reset).

2. If the problem is not solved after treatment as Item 1, then please check if the related hardware equipment is normal (power distribution, wiring, proper terminals connection or A / B contact~~type~~ etc.)

310390	The machine stops too long and shuts the motor.

Reason: The motor will be OFF if it is idle for a while after being turned on, and this alarm will be activated.

Solutions: 1. Refer to the parameter (R (32664), To turn off the motor after a long time stop) to decide whether to use the function.

2. After the function parameter of item 1 is ON, the time to OFF the motor will be decided according to the parameters (R (32663), the time to OFF the motor

without actions (minute) after the motor is started). Please adjust for the appropriate value.

310391	Not allowed for the injection unit to move forward/back and stop at the same time.

Reason: The signals for the injection unit to move forward/back and stop are triggered at the same time.

Solution: 1. Please set in the reasonable position for the injection unit to move forward/backwardand stop.

310392	The injection unit does not move back to the positioned place.

Reason: The safety check before mold transfer will avoid hitting the mechanism (barrel). (The request is commonly for the C-type machines, but it should depend on the demand of machines.)

Solution: Please ensure whether the injection unit moves back into position. If not, keep moving back to the position the injection unit should stop.

310416	Mold Adjusting parameter setting error mold
310418	Forward Mold Adjusting parameter setting error mold
310419	Backward Mold Adjusting parameter setting error mold

Reason: Incorrect setting of Mold Adjusting parameter.

Solution: 1. Error could be caused by related procedure.

2. Please contact our personnel concerned or the machine supplier.

310422	Please perform it under Mold Adjusting mode

Reason: During the operation of auto (manual) pressure / flow calibration, if it is not in the mode of Mold Adjusting, the alarm will be activated.

Solution: Please switch to the mode of Mold Adjusting for operation.

310480	Disconnected to robot

Reasons: 1. The function of robot must be started first (Refer to parameter R (32600), The mechanical mode [0: Not in use 1: Semi 2: Manual])

2. When the function of Item 1 is started, if the robot connection signal is not functioning, (this is the hardware input signal) the alarm will be activated.

Solution: 1. The robot connection signal is a hardware input signal. If it isn't functioning normally, please check if the related hardware equipment is normal (power

distribution, wiring, proper terminals connection or A / B contact etc.)

310481	Robot does not allow mold clamping

Reasons: 1. The function of robot must be started first (Refer to parameter R (32600), the Mechanical Mode [0: Not in use 1: Semi 2: Manual])

2. When the function of Item 1 is started, if the signal that Robot does not allow mold clamping (this is a hardware input signal) is invalid, the alarm will be activated.

Solution: The signal that Robot does not allow mold clamping is a hardware signal on IN point. If it isn't functioning normally, please check if the related hardware equipment is normal (power distribution, wiring, proper terminals connection or A / B contact etc.)

310512	Exceeds the Monitor Time of the whole cycle

Reason: The entire production process of the single injection takes longer than (the Monitor Time of the whole cycle).

Solution: Please adjust the whole cycle time to a suitable value (parameter R(32400), monitor time of the whole cycle) to avoid incorrect alarm activation.

310544	Finished products do not fall.

Reason: When the fall detector of the finished products is turned ON (parameters R (32602), for detection signal of the fall detector), if the electric eye signal is not activated during the cycle interval, the alarm will be activated.

Solutions: 1. The electric eye signal is a hardware input signal. If it isn't functioning normally, please check if the related hardware equipment is normal (power distribution, wiring, proper terminals connection or A / B contact etc.)

2. Please adjust the cycle time interval to a suitable value, to avoid the malfunction of the alarm due to the insufficient time for electric eye signal activation.

310576	The number of good parts has met the requirement.

Reason: At the end of each production, the number of good parts would be checked for requirement. If the number of good parts has reached the number of settings, this alarm is activated.

Solution: 1. The setting parameter of the requirement of the good parts number is R (32402).

2. When the parameter mentioned in item 1 is not appropriate set, it may affect the

production. Please set the required quantity of good parts according to practical production.

310577	Number of consecutive non-good parts exceeds the limit.

Reason: At the end of each production, the number of non-good products would be checked; if the number of consecutive non-good parts has reached the number of settings, this alarm is activated.

Solution: 1. To allowed number of consecutive non-good parts is the parameter R(32405).

2. When the parameter mentioned in item 1 is not appropriate set, it may affect the production. Please set the value to an appropriate limit according to the actual production.

310578	Prohibition of the automatic action

Reason: To restrict the use of automatic production mode, it will still return to the manual mode after the production of the injection cycle, and the alarm is activated for reminding even when it has been switched to the automatic mode.

Solution: 1. The setting parameters for prohibition of automatic action is R (32662).

310579	Pressing left-right start buttons longer than the interval.

Reasons: 1. Under manual mode, the left-right start buttons can be pressed simultaneously to execute the mold-clamping procedure (including high pressure mold closing). In order to avoid operators' mis-operations, it requires both hands to press the left-right start buttons individually at the same time.

2. In Production Mode, the left-right start buttons have different strokes according to the machine actions (for example: no (or not use) Mold Transfer function); in order to avoid operators' mis-operation, it requires both hands to press the left and right start buttons individually at the same time.

Solutions: 1. To run any operation by pressing the left-right start buttons, please use both hands to press them individually.

2. If Item 1 can still not work normally, then please adjust the appropriate time interval (parameter R(32680), interval required for the left-right start buttons)

Note: This alarm is generally used for vertical machine versions.

310736	PLC Alarm

Reason: If the alarm source is PLC, it is used to indicate the alarm source (currently, the IN1xxx series have no PLC functions).

Solution: Recognize the trigger condition of the alarm in the ladder diagram and deal with

it.

7 OP Warn

320000	Please firstly do the zero return adjustment for the injection potentiometer.

Reason: When using an optical or the magnetic linear encoder as the injection potentiometer, it is used to prompt the items needed to execute first before switching to the production mode or any screw action *(This warning does not exist in all of control machine)*

Solution: Do the zero return adjustment for the injection potentiometer in the Mold Adjusting mode.

320001	The completion of the zero return calibration for the injection potentiometer.

Reason: A warning reminder when the zero return calibration for the injection potentiometer is done.

Solution: Just reset it after the confirmation.

320320	Automatic temperature adjustment is completed.

Reason: A warning reminder when the automatic temperature adjustment operation is done.

Solution: Just reset it after the confirmation.

320321	Under automatic temperature adjustment.

Reason: When performing the temperature calibration, it is used as a warning.

Solution: Just confirm it; do not make any reset operation, or otherwise the temperature calibration operation could be suspended (this mechanism varies in different software versions).

320322	Temperature heating completed

Reason: This is used as a reminder for operators to perform manufacture, when temperature of each zone is within the range value of set temperature. *(This mechanism varies in different software versions)*

Solution: Just reset it after the confirmation.

320416	Mold Adjusting completed

Reason: A warning reminder when mold adjusting is completed under Mold Adjusting mode.
Solution: Just reset it after the confirmation.

320417	Limits of Mold Adjusting reached

Reason: This is a safe protection during mold adjusting forward/backward under Mold Adjusting mode, and will appear when the proximity switch for the limits of mold adjusting forward or backward is triggered (This warning is usually appeared on the toggle machine).
Solution: 1. Just reset it after the confirmation.
2. The limits of Mold Adjusting forward/backward are hardware input signals, If it isn't functioning normally, please check if the related hardware equipment is normal (power distribution, wiring, proper terminals connection or A / B contact etc.)

320576	The number of residual good parts has met the requirement.

Reasons:1. The number of residual good parts of this batch = The required numbers of good parts in each package – the number of available good parts of this batch
2. When "the number of residual good parts of this batch" <= "The number of the leftover for packaged good parts", this alarm will be activated.
Solution: Please confirm and deactivate.

320608	Under automatic pressure adjustment

Reason: A warning reminder when performing the automatic pressure adjustment
Solution: Just confirm it; do not make any reset operation, or otherwise the pressure calibration operation could be suspended (this mechanism varies in different software versions).

320609	Automatic pressure adjustment completed

Reason: A warning reminder when the automatic adjustment is completed.
Solution: Just reset it after the confirmation.

320610	Under automatic flow adjustment

Reason: A warning reminder when performing automatic flow adjustment.
Solution: Just confirm it; do not make any reset operation, or otherwise the automatic flow calibration operation could be suspended *(this mechanism varies in different software*

versions).

320611	Automatic flow adjustment is completed.

Reason: A warning reminder when the automatic flow adjustment operation is done.
Solution: Just reset it after the confirmation.

8 HMI Alarm

8.1 IN5800、IN6000、IN6200、N7000、IN7200 Series

210000	Parameter definition files error

Reason: The structure of file or parameter definition file may be defective, causing the inability of reading data.
Solution: Please change a new CF card.

210002	No parameter definition files available

Reason: System does not detect any parameter definition files.
Solution: Please change a new CF card

210003	Printing format files cannot be opened

Reason: PC-side program is unable to detect printing format files.
Solution: Please re-install PC-side program.

210004	Repeated DI mapping

Reason: Different DI numbers are configured to the same hardware access point.
Solution: Please reset the hardware access points of DI mapping.

210005	Repeated DO mapping

Reason: Different DO numbers are configured to the same hardware access point.
Solution: Please reset the hardware access points of DO mapping.

210006	Unable to load string file

Reason: System is unable to detect the language of the string file that user chose.
Solution: Please change a new CF card

9 HMI Warn

9.1 IN5800、IN6000、IN6200、N7000、IN7200 Series

220000	Setting Records unsaved, please restart the machine

Reason: Abnormality in file system causes the unsaved record settings.
Solution: Please restart the machine, if the condition remains, please change the CF card.

220001	Irregular records unsaved, please restart the machine

Reason: Abnormality in file system causes the unsaved irregular records.
Solution: Please restart the machine, if the condition remains, please change the CF card.

220002	Authorized settings unsaved, please restart the machine

Reason: Abnormality in file system causes the unsaved authorized settings.
Solution: Please restart the machine, if the condition remains, please change the CF card.

220003	Upgrade failed!! Check files does not exist

Reason: System is unable to find the check file when upgrading the program.
Solution: Please check the completion of upgrade file, confirm if any missing files available.

220004	Upgrade failed!! Upgraded file damaged

Reason: Upgrade file was found as damaged when upgrading the program.
Solution: Please check the completion of upgrade file, confirm if the file has damaged.

220005	Maintenance required

Reason: The items that are set by user are in the condition of needing maintenance.
Solution: Please maintain these items, and move to the screen of maintenance to complete the setting.