M8M / M10M Standard

HMI Controller & Software Manual

Standard Version

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Preface

This Controller & Software Manual for the Techmation M10M HMI Series (Standard Version) consists of two parts, the Operations Manual and the Reference Manual.
Please refer to the Operations Manual for exact instructions on how to set up and program the machine's clamping unit, injection unit, production monitor and the printing and networking functions.
For a detailed explanation of the HMI panel and panel keys as well as for the various HMI display screens please use the Reference Manual.

 **Warning:** For safety precautions and general machine operation and maintenance you must refer to the machine manufacturer's manual. This is essential to avoid serious injury to the machine operator and to prevent damage to the machine. Changing the machine setup and settings without proper care and knowledge can lead to damage to the machine.

Liability: Techmation assumes no liability in any form for machine operation in connection with the use of this manual. It is your responsibility to ensure safe machine operations. Never operate the machine without proper training and instructions. Read both manuals first (the machine manufacturer's manual and Techmations's Controller & Software manual) before attempting any operation of the machine.

Please note that the information in this manual is subject to change without notice.

For any further information, spare parts & services, documentation & product updates, general inquiries etc., please contact us at the following address:

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We hope you will find this manual helpful for your machine operations. In order to help us improve our products and documentation we encourage you to provide us with any feedback and suggestions for improvement you might have.

Table of Contents

1. Operations Manual

The instructions within the Operations Manual assume that you are familiar with the HMI panel keys and the various HMI display screens. If you are not or you are looking for more information on any of the keys or display screens please refer to the appropriate section within the Reference Manual.

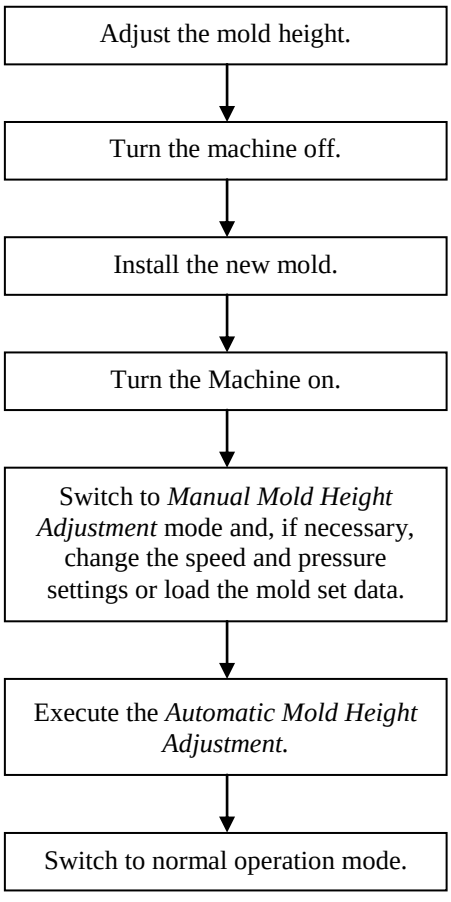
1.1 Clamping Unit Setup

When changing the mold follow the machine manufacturer's instructions at all times to avoid the possibility of serious injuries to the machine operators.
After changing the mold you have to ensure that the mold and the nozzle/injection unit are properly aligned to avoid damage to the machine. In addition, you need to make sure all necessary hose connections to the mold have been properly established and the mold has been mounted securely.

1.1.1 Mould Height Adjustment

Before installing the mold use the *Mold Adjustment* keys to adjust for mold thickness and to advance or retract core(s) if necessary.

Press the *Reduced Mold Height Adjustment Key* to roughly adjust for a reduced mold height (reduced distance between moving and static platen) or the *Increased Mold Height Adjustment Key* to roughly adjust for an increased mold height (increased distance between moving and static platen).



For continuos platen movement press and hold the key. The platen will move slightly and stop. Keep the key pressed and after a one-second delay the platen will start to move continuously. Release the key to stop platen movement. If you press the key and release it immediately, the platen will move slightly and stop, allowing for micro adjustments. You can repeat this operation until the moving platen has reached the desired position.

Turn the machine off and install the new mold.

Once you have finished the installation of the new mold, close the safety gate, turn on the machine and press the *Manual Mold Height Adjustment On/Off Key* once to activate the *Manual Mold Height Adjustment* mode. Switch the HMI display to the *Other Settings* screen by pressing *F7 (Other 1)*. This screen allows you to change the speed and pressure settings after the mold has been changed. If necessary, adjust the pressure, speed and position settings for the new mold or load the mold set data.

After adjusting the settings press the *Manual Mold Height Adjustment On/Off* key again to close the mold. While closing the mold the controller will execute an automatic mold height adjustment until the new settings are reached. Once the automatic adjustment has finished all machine operations will stop and the alarm will sound. This indicates that you can now switch back to manual or automatic operation modes.

Please note that for safety reasons you have to switch to *Manual* mode first by pressing either the *Manual Mold Height Adjustment On/Off* key or the *Manual* key. If you wish to use any other mode, please change to the desired mode after you have switched to *Manual* mode.

If you encounter any problems during the mold height adjustment press the *Manual* key for an emergency reset to stop the operation.

1.1.2 Mold Closing and Mold Protection

Mold closing is executed in three phases: *High Speed* closing, *Low Speed* closing and *High Pressure* closing. For optimum productivity mold closing should be executed as fast as possible. However, to avoid damage to the mold and/or machine it is important to use correct settings to ensure appropriate mold protection. For this reason pay particular attention to the *Slow Speed* phase.

Press the *Manual* key to activate the *Manual* mode. Switch the HMI display to the *Clamp Settings* screen by pressing *F2 (Clamp)*.

Set the *Mold Opening Stroke*. *The Mold Opening Stroke* is measured from the closed mold. Therefore the *Mold Opening Stroke* position is "0" when the mold is in its closed position.

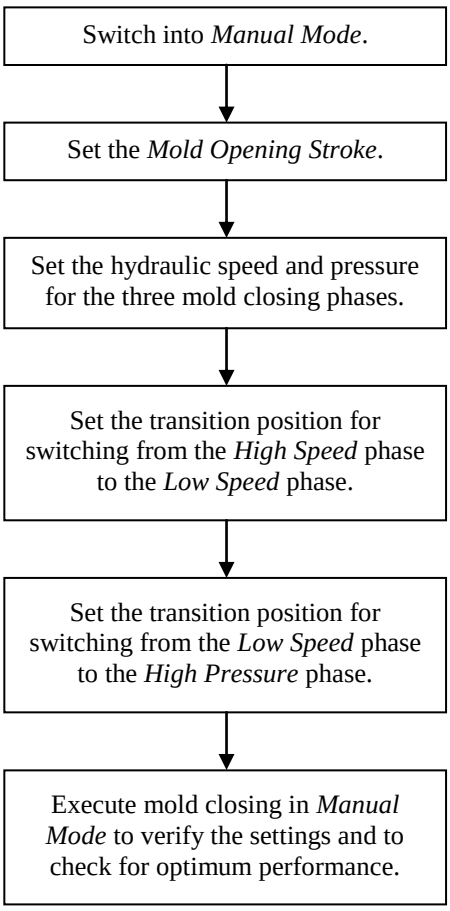
Next enter the desired hydraulic speed and pressure settings for the three mold closing phases. You have to ensure that the settings allow for a smooth, jerk-free movement of the mold.

Set the hydraulic speed for the *Low Speed* phase low enough to avoid damage to the mold in case a jammed part has remained in the mold. For the same reason set the lowest hydraulic pressure possible.

To avoid damage to the mold the transition point for switching between *High Speed* and *Low Speed* phase should be set before the position where the mold could come into possible contact with a jammed part.

The transition point for switching from the *Low Speed* to the *High Pressure* phase should be set at the position where both parts of the mold are starting to touch to initiate the high pressure mold lock-up.

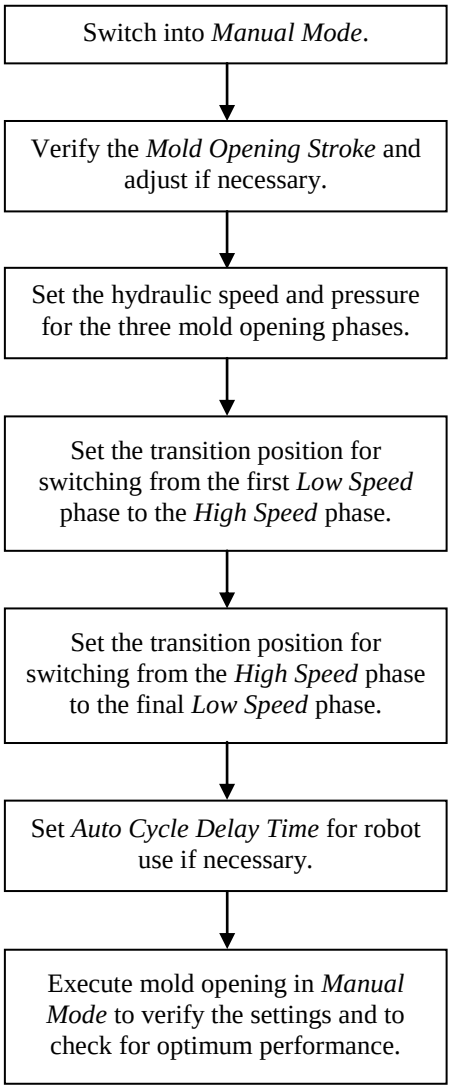
To accelerate mold closing you can activate the differential high-speed mold closing option for the *High Speed* closing phase.



After setting all mold closing parameters execute mold closing in *Manual Mode* to check for optimum machine performance. If you encounter any problems during the mold closing adjustment press the *Manual* key for an emergency reset to stop the operation.

1.1.3 Mold Opening

Mold opening is divided into three phases. The initial *Slow Speed* opening, an intermediate *High Speed* phase and a final *Low Speed* phase to slow down the mold before the opening end position is reached.



Press the *Manual* key to activate the *Manual* mode. Switch the HMI display to the *Clamp Settings* screen by pressing *F2 (Clamp)*.

Verify the *Mold Opening Stroke* and adjust if necessary. The *Mold Opening Stroke* is measured from the closed mold. Therefore the *Mold Opening Stroke* position is "0" when the mold is in its closed position.

Next, enter the desired hydraulic speed and pressure settings for the three mold opening phases. You have to ensure that the settings allow for a smooth, jerk-free movement of the mold.

Set the hydraulic speed for the initial *Low Speed* phase low enough to allow for a smooth separation of the part from the mold.

Adjust the transition point for switching from the initial *Low Speed* phase to the intermediate *High Speed* phase accordingly.

The transition point setting for switching from the intermediate *High Speed* phase to the second *Low Speed* phase should allow the mold to slow down sufficiently before reaching the end position of the *Mold Opening Stroke*. This is necessary to avoid possible damage to the machine.

In case you want to use a robot to retrieve the mold product at the end of the mold opening/production cycle you need to set the *Auto Cycle Delay Time*. Enter the time to elapse between the end of mold opening and the beginning of mold closing (indicating the start of the next production cycle).

After setting all mold opening parameters execute mold opening in *Manual Mode* to check for optimum machine performance. If you encounter any problems during the mold opening adjustment press the *Manual* key for an emergency reset to stop the operation.

1.1.4 Ejector

The ejector can be operated in three different modes to knock the finished product out of the mold at the end of mold opening. You can choose between the *Hold*, *Count Number* and the *Vibration* modes.

The *Hold* mode is used during semi-automatic operation. The ejector moves forward according to the ejector settings and the product is dropped or taken out. After the safety gate has been opened and closed the next cycle will start.
In *Count Number* mode the ejector is activated according to the *Ejector* and *Ejection Count* settings. This mode is usually used for automatic machine operation. It does not require the opening and closing of the safety door to continue the production cycle.
If you use the *Vibration* mode the ejector movement is controlled by the *Ejector* and *Ejection Count* settings with the ejector vibrating at the end of the forward movement according to the *Vibration* setting set in the *Parameter 2* screen (setting No. 6) before retracting again.

Press the *Manual* key to activate the *Manual* mode. Switch the HMI display to the *Ejection Settings* screen by pressing *F5 (Eject)*.

First, set the *Ejection Mode* and *Count.* Please note, if you want to deactivate the ejector you can do so by setting the *Ejection Count* to "0".

The *Eject Try Again* function is used for the *Photo Sensor* auto operation mode. If the mold product cannot be knocked out completely, the alarm will sound and the ejector will be activated again. If the mold product is then successfully knocked out the machine will resume normal operation; otherwise it will stop for trouble shooting.

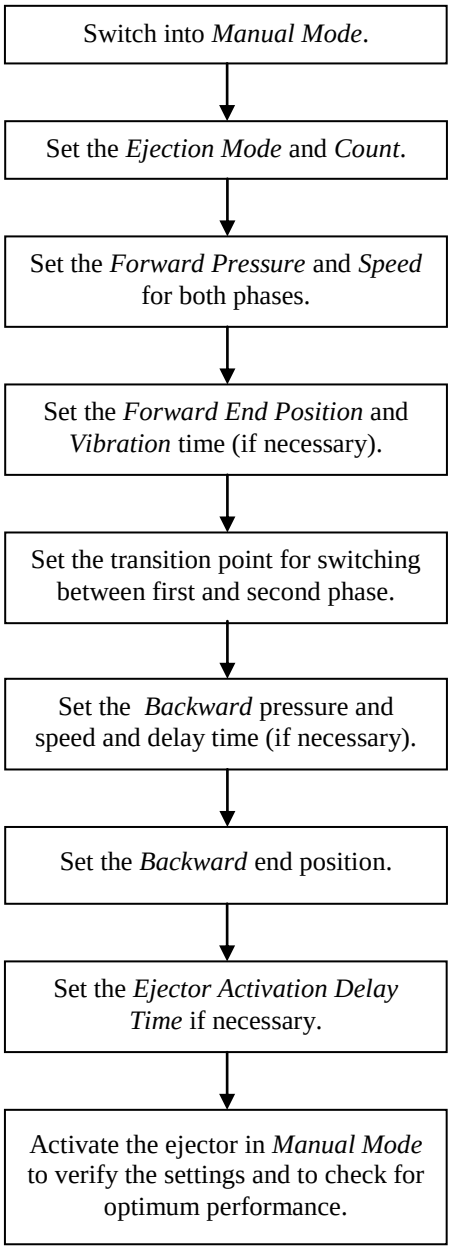
If the mold product has not been knocked out successfully while in *Photo Sensor* auto operation mode and the *Eject Try Again* function is not activated, the alarm will sound and the machine will stop for ejection trouble shooting.

The initial ejection is divided into two phases that can be controlled separately. Set the pressure, speed and transition position individually for each phase.

Next, set the pressure and speed for the backward movement. The *Backward Delay* time allows you to set the time the ejector will stay in the forward end position before it is retracted.

In addition, set the *Backward* end position for the ejector retraction between repeated activation (in case of multiple ejector activation). Please note, the *Backward* end position is relative to the absolute retraction end position that is used after final ejector activation and determined by the transducer zero point setting.

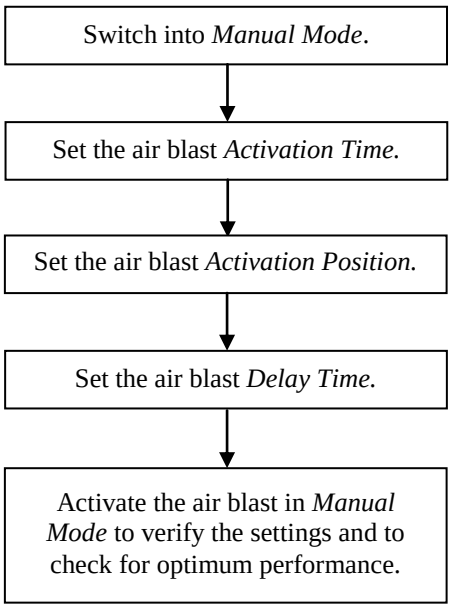
If you require additional cooling of the mold product after mold opening, set the *Ejector Activation Delay Time* accordingly.



After setting all ejection parameters activate the ejector in *Manual Mode* to check for optimum machine performance. If you encounter any problems during the ejection set-up press the *Manual* key for an emergency reset to stop the operation.

1.1.5 Air Blast

The machine provides an air blast ejection option for the moving platen as well as for the stationary platen.



Press the *Manual* key to activate the *Manual* mode. Switch the HMI display to the *Ejection Settings* screen by pressing *F5 (Eject)*.

First, set the *Activation Time* (duration of air blast) for each platen.

Set then the corresponding *Activation Position* at which you want to activate the air blast. The *Activation Position* refers to the mold position (reached during mold opening) at which the air blast is activated.

If necessary, set the *Delay Time* for activating the air blast (after the *Activation Position* has been reached) according to your preferences.

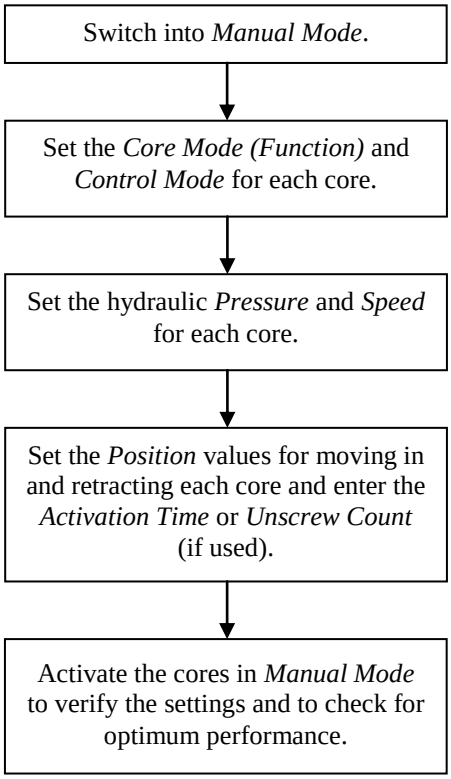
In case you require additional cooling of the mold product after mold opening, set the *Delay Time* for the air blast activation accordingly.

After setting all air blast parameters activate the air blast in *Manual Mode* to check for optimum machine performance. If you encounter any problems during the air blast set-up press the *Manual* key for an emergency reset to stop the operation.

1.1.6 Core(s)

Depending on your setup your machine may be equipped with up to 3 cores (A, B and C). Each core is controlled separately. When setting up the core(s), you need pay close attention to make sure the settings will not cause damage to the core(s) and/or the mold. Since the cores are freely programmable it is impossible for the controller to prevent all possible settings errors.
The two graphs on the right side of the *Core Settings* screen indicate the core movement in relation to mold closing (top) and opening (bottom).

Press the *Manual* key to activate the *Manual Mode*. Switch the HMI display to the *Core Settings* screen by pressing *F6 (Cores)*.



First, choose for each core either the *Core Mode* if you want to use a regular core that is moved in and retracted hydraulically or the *Unscrew Mode* if your mold requires threads created by unscrewing the inserted core. If the core is not needed set the *Function* value to "0".

Next, select the desired *Control Mode* to control the core movement. In *Core Mode* you can use either *Cycle Control* or *Time Control*. In *Unscrew Mode* you can use *Time Control* or *Count Control*.

Using *Cycle Control* allows you to control the core movements by limit switches for end-position control (for insertion and retraction). At the pre-set point during the production cycle the core(s) will move in/out until the limit switch controlled end-position is reached. Please make sure the limit switches are activated since deactivated switches will cause the machine to stop (if *Cycle Control* is selected).

Time Control uses time settings for core insertion and retraction. At the pre-set position during the production cycle the core(s) are moved in/out for the set period of time. Therefore core movement (travel) is not controlled by end-position but by time. As a result you will not be able to rely on the protection of limit switches.

Accordingly, in *Unscrew Mode* the *Time Control* is used to set the time core unscrewing is activated (e.g. for creating threads).

Count Control uses the pre-set number of revolutions to control the unscrewing of the core at the set position during mold opening. To use *Count Control* you have to make sure a photo sensor for counting the revolutions is installed on the core driving gear.
Please note that *Count Control* allows for higher precision than *Time Control*.

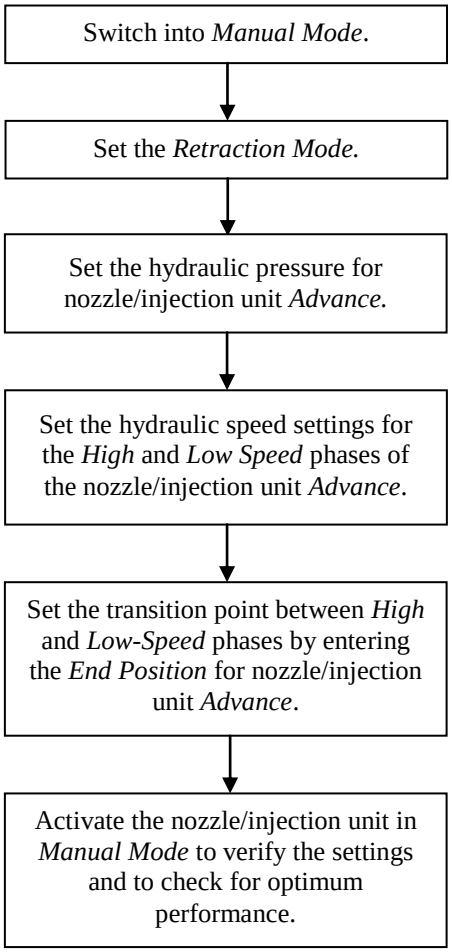
Set the *Pressure*, *Speed*, *Activation Time*, *Unscrew Count* (if used) and *Position* values for moving in and retracting each core according to your needs.
Unique to *Core A* is the possibility to activate *Core Unscrewing* a second time (*2nd Uns*.) at the end of the mold opening cycle. Please note that the second unscrewing can only use *Count Control*.

After setting all core parameters activate the core(s) in *Manual Mode* to check for optimum machine performance. If you encounter any problems during the core set-up press the *Manual* key for an emergency reset to stop the operation.

1.2 Injection Unit Setup

1.2.1 Nozzle/Injection Unit

Depending your requirements you can set up the nozzle/injection unit to retract after injection has finished. The controller offers you 3 different modes to choose from if nozzle/injection unit retraction is needed.



Press the *Manual* key to activate the *Manual* mode. Switch the HMI display to the *Other Settings* screen by pressing *F7 (Other 1)*.

First, set the *Retraction Mode* (*Sprue Back*). The *After Charge* mode (*A. Chg.*) retracts the nozzle/injection unit after charging (plasticizing) is finished. The *Before Opening* mode (*B. Opn.*) initiates nozzle/ injection unit retraction before mold opening starts. If you want to retract the nozzle/injection unit after injection has finished choose the *After Injection* mode (*A. Inj.*). Setting the value to "0" will cause the nozzle and injection unit to stay in place (no retraction).

Next, set the hydraulic pressure for nozzle/injection unit *Advance*. Enter the hydraulic speed settings for the corresponding *High* and *Low Speed* phases of the nozzle/injection unit *Advance*. During the forward movement the *High-Speed* settings are used until the set *End Position* is reached. Thereafter the nozzle/injection unit will move forward using the *Low-Speed* settings, until it has reached the final injection position.

Enter the *End Position* for the *Advance* movement to set the transition point between *High* and *Low-Speed*. It is important to allow for a safety margin of at least 20mm between the set *End Position* and the actual contact point of nozzle and mold (at which the nozzle stops its forward movement and the injection begins). If the *End Position* is set too close to the contact point of nozzle and mold the nozzle might not slow down enough before touching the mold. The result could be damage to mold and/or nozzle.

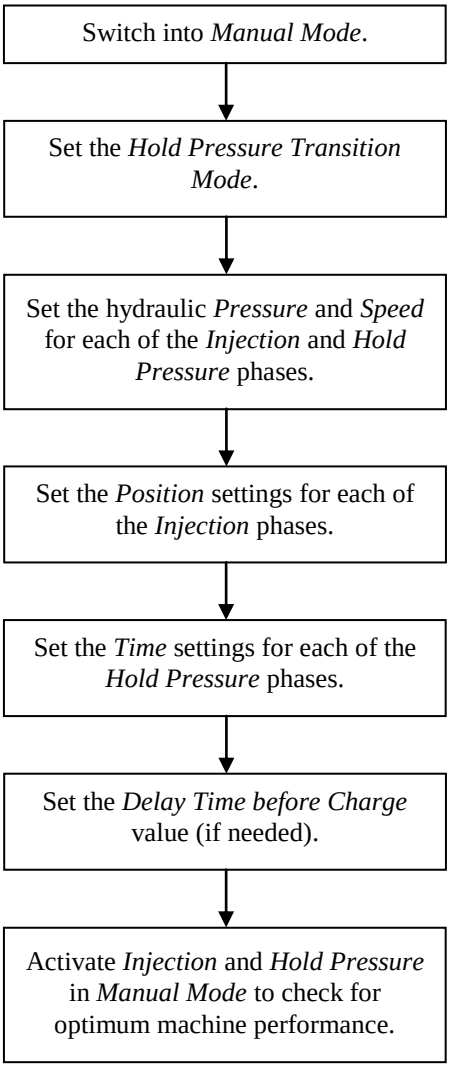
Please note that a position setting of "0" refers to the position reached at the end of maximum nozzle/injection unit retraction. As a result the *Advance End Position* is always greater than "0".

After setting all nozzle/injection unit parameters activate the nozzle/injection unit in *Manual Mode* to check for optimum machine performance. If you encounter any problems during the nozzle/injection unit set-up press the *Manual* key for an emergency reset to stop the operation.

1.2.2 Injection and Hold Pressure

Depending on your machine set-up the *Injection* process is divided into 4 - 6 phases and *Hold Pressure* into 3 - 4 phases. The corresponding pressure - position graph of the current injection settings and the real-time values achieved during the current *Injection/Hold Pressure* cycle are display in the *Injection Settings Profile*. Press *F4 (Profile)* to access the *Injection Settings Profile* screen for a review of your settings.

Activate the *Manual Mode* by pressing the *Manual* key. Switch the HMI display to the *Injection Settings* screen by pressing *F3 (Inject)*.



First, choose the *Hold Pressure Transition Mode*. If the *Time* mode is used the controller will switch to *Hold Pressure* after the set injection time has elapsed. In case the *Position* mode has been selected the controller will switch to *Hold Pressure* after the last set injection position has been reached. However, the set time is used as a backup to initiate the *Hold Pressure* phase if for some reason the set transition position cannot be reached.

Please note that you should always set the time limit higher than the usually required injection time. This avoids poor molding results due to possible resign fluidity variations (poor fluidity could require a longer than usual injection time). The transition between each *Hold Pressure* phase is controlled by the corresponding time settings and is not affected by the *Hold Pressure Transition Mode* settings.

It is possible to use a combination of pressure and time settings to control the injection process by setting the position value for the transition from *Injection* to *Pressure Hold* to zero. In this case the final position will never be reached and the pre-set injection time will be used as a backup. However, doing so will disable the monitoring of the current injection data and as a result you will not be able to use the injection cushion for monitoring the injection process. Please refer to the *Monitor Settings 1* section of the reference manual for more information on monitoring options.

Next, set the hydraulic pressure and speed for each of the *Injection* and *Hold Pressure* phases.

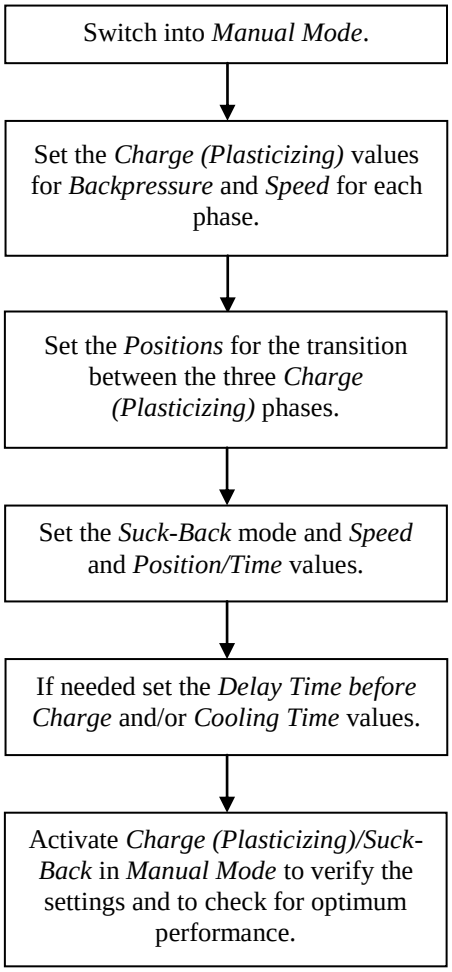
Enter the *Position* settings for each of the *Injection* phases and the *Time* settings for each of the *Hold Pressure* phases.

If cooling is needed at the end of *Injection*/*Hold Pressure* and before *Charge (Plasticizing)/Suck-Back* is initiated set the desired *Delay Time before Charge* value accordingly.

After setting all *Injection*/*Hold Pressure* parameters activate *Injection* and *Hold Pressure* in *Manual Mode* to check for optimum machine performance. If you encounter any problems during the *Injection*/*Hold Pressure* set-up press the *Manual* key for an emergency reset to stop the operation.

1.2.3 Charge (Plasticizing) and Suck-Back

Charge (Plasticizing) is divided into three phases. You can set the *Backpressure* and *Speed* for each phase individually. *Suck-back* is initiated at the end of *Charge (Plasticizing)* if required.



Press the *Manual* key to activate the *Manual* mode. Switch the HMI display to the *Injection Settings* screen by pressing *F3 (Inject)*.

First, set the *Charge (Plasticizing)* values for *Backpressure* and *Speed* individually for each phase.

Next, enter the *Positions* for the transition between the three *Charge (Plasticizing)* phases.

Choose the *Suck-Back* mode. Depending on the selected mode, *Suck-Back* will be controlled using the *Position* or *Time* setting. Choose the value "0" for *Position* control and the value "1" for *Time* control.

In addition, enter the *Suck-back Speed* and *Position/Time* values. The same input field (below the *Suck-Back Pressure* and *Speed* settings) is used for both, the *Time* and the *Position* settings. The field label will change according to the selected mode to indicate the required value.

Set the *Suck-back Position/Time* value to "0" if no *Suck-back* is needed.

If cooling is needed at the end of *Injection*/*Hold Pressure* and before *Charge (Plasticizing)/Suck-Back* is initiated set the desired *Delay Time before Charge* value accordingly.

In case cooling is needed after the completion of *Charge (Plasticizing)/Suck-Back* and before the mold is opened enter the desired *Cooling Time*.

After setting all *Charge (Plasticizing)/Suck-Back* parameters activate *Charge (Plasticizing)* and *Suck-Back* in *Manual Mode* to check for optimum machine performance. If you encounter any problems during the *Charge (Plasticizing)/Suck-Back* set-up press the *Manual* key for an emergency reset to stop the operation.

1.2.4 Heater

Depending on your machine set-up the barrel heater of the injection unit is equipped with up to 9 barrel heating zones. The temperature, cushion and timer is controlled separately for each of the barrel's heater bands. The right hand graph shows the current (actual) and set temperature for each barrel heating zone.

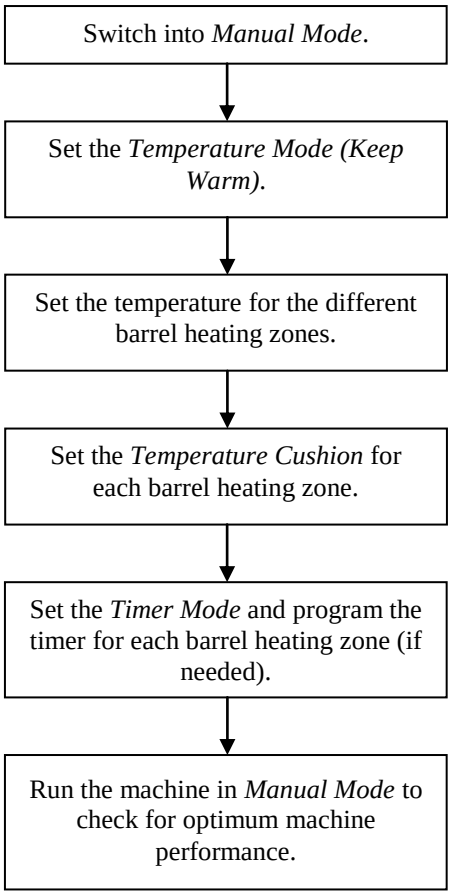
Activate the *Manual Mode* by pressing the *Manual* key. Switch the HMI display to the *Temperature Settings* screen by pressing *F8 (Temp)*.

First, set the *Temperature Mode (Keep Warm).* Choose "0" if you want to keep the temperature always in the pre-set range regardless of the machine operation. If set to "1" the heater will keep the barrel temperature at half the pre-set temperature during times of inactivity.

Next, set the temperature for the different barrel heating zones. The field below *(Act. State)* gives you a quick indication on the current heater status for the corresponding barrel heating zone. The * indicates the current temperature is within the set range (cushion). The + indicates the current temperature is below the set range (cushion) and the heater has been activated. The - indicates the current temperature is exceeding the set value and as a result the heater has been turned off.

Please note that the heater will be turned off immediately once the current temperature exceeds the set value. For current temperatures below the set value heater activation depends on the set *Temperature Cushion*.

To adjust the *Temperature Cushion*, please press *F5 (Para. 2)* to go to the *Parameter 2* screen. Adjust the corresponding values within the second column. A cushion value of "20" for example would activate the heater once the current temperature has dropped more than 20°C below the set value.



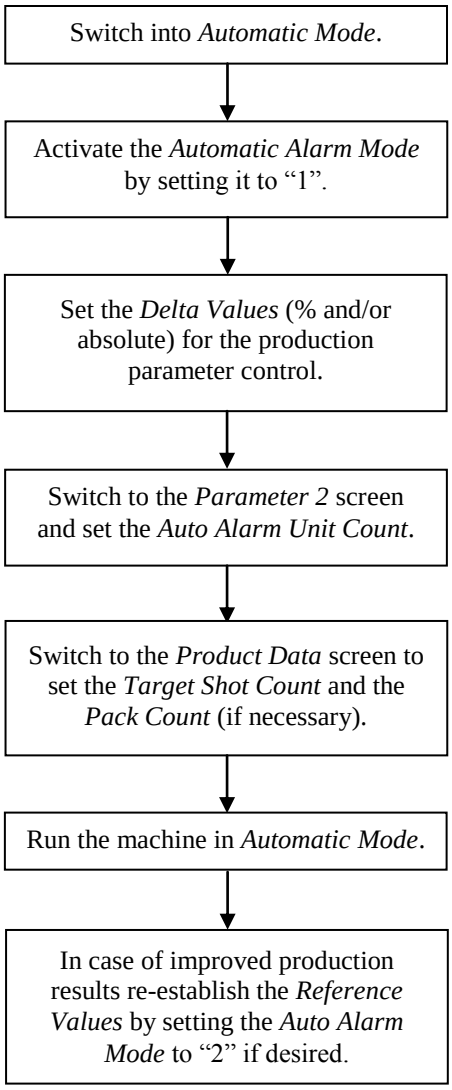
If you want to use the *Timer* for barrel pre-heating set the *Timer Mode* to "1" otherwise disable it by entering "0". To program the barrel heater band activation set the time and day individually for each barrel heating zone.

In case of temperature related malfunctions a "977", '988" or "999" will be displayed in the *Real Value* field. A "977" refers to either a disconnected or malfunctioning D/A Temperature Card. The value "988" identifies either a problem with the Thermal Wire Interface or the corresponding Temperature Sensor. In case the current temperature is exceeding the normal temperature range (the current temperature is above 450º C) the value "999" will be displayed.

After setting all *Heater* parameters run the machine in *Manual Mode* to check for optimum machine performance. If you encounter any problems during the *Heater* set-up press the *Manual* key for an emergency reset to stop the operation.

1.3 Production Monitor Setup

The HMI and controller provide you with automatic production monitoring and alarm features. The system allows you to set a desired operating range with upper and lower limits (Delta Values) for each production parameter. Once the current parameter value is outside the set operating range the machine will stop operation and the alarm will sound. For later analysis the monitoring system will record the time and the type of error that caused the alarm. To access the *Alarm/Error Message Display* screen press *F6 (Alarm)*.



At the beginning of each operation, the automatic alarm is turned off until the machine has finished the pre-set number of production cycles in *Auto Operation* mode. After the number of pre-set production cycles the automatic alarm will be activated and the achieved parameter values of the last production cycle will be used as reference points for the upper and lower limits (Delta Values) of each production parameter. Should any of the current production parameters during the next production cycle and thereafter be outside the set upper and lower limits (Delta Values) the alarm will sound and machine operation will stop for trouble shooting.

The activation of the automatic alarm function is delayed to allow for a stabilization of the production cycles. At the start of machine operation it is normal that the current production parameters vary considerably from one cycle to the next before they begin to stabilize. You should consider this when setting the number of production cycles before automatic alarm activation to allow for a smooth operation without interruptions.

Press the *Time Auto* key to activate the *Automatic* mode. Switch the HMI display to the *Monitor 1* screen by pressing *F1 (Moni 1)*.

First, activate the *Automatic Alarm Mode* by setting the *Auto Alarm* value to "1".

Next, set the *Delta Values* (% and/or absolute) for the production parameter control. See below for a more detailed explanation for the calculation of upper and lower limits based on the *Delta Values*.

To adjust the automatic alarm activation settings switch to the *Parameter 2* screen by pressing *F5 (Para. 2)* and enter the desired value into field No. 0 in the 4th column from the left.

Switch to the *Product Data* screen by pressing *F9 (Prod)*. Set the *Target Shot Count* and the *Pack Count* (if necessary). Please note that the *Pack Count* feature is optional and requires the installation of a separate sensor for the *Pack Count* input. After setting the *Target Shot Count* and the *Pack Count* switch back to the *Monitor 1* screen by pressing *F1 (Moni 1)*.

Run the machine in *Automatic Mode* after setting all parameters until the activation of the *Auto Alarm Mode* to verify the settings and to check for optimum performance. In case of improved production results after the activation of the *Auto Alarm Mode* re-establish the *Reference Values* by setting the *Auto Alarm Mode* to "2" if desired.

To set the upper and lower limits for current production parameters you can use % values and/or absolute values. These *Delta Values* are then used in connection with the established *Reference Value* to determine the upper and lower limits. In case you use a combination of % and absolute values the upper/lower limits will be calculated according to the following formula:

Upper Limit	Where
RV + (RV * x/100) + y	RV = Reference Value x = Delta Percentage Value (e.g. 10 for 10%)
Lower Limit	y = Delta Absolute Value
RV - (RV * x/100) - y	

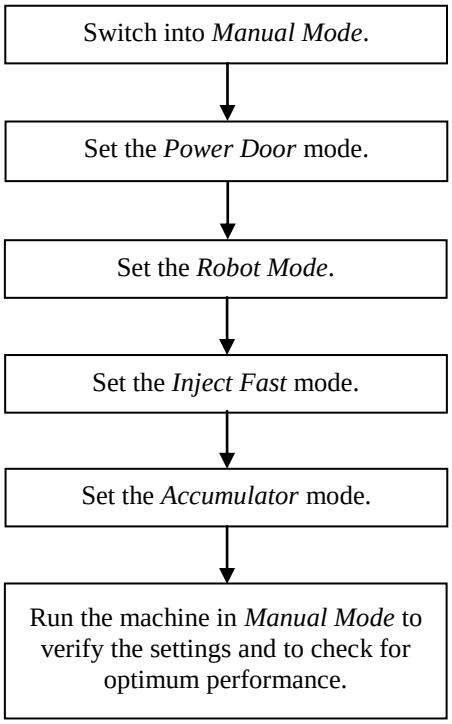
Since the *Reference Values* are not fixed and vary from one machine operation cycle to the next the values are lost once the machine is turned off. They will be re-established at the beginning of the next operation cycle by using the current parameter values to determine the new reference points for the upper and lower limits (*Delta Values*).

If at some point after establishing the *Reference Value* you want to replace them with the currently achieved parameter values (e.g. because of improved production results) you can set the *Auto Alarm Mode* at the top of the screen to "2". The controller will then use the parameter values of the last production cycle as the new reference values.

In all other cases the displayed *Auto Alarm* mode indicates, if the *Auto Alarm* has already been activated (mode 1) or if the necessary number of production cycles for establishing the reference values has not yet been reached (mode 0).

1.4 Other Functions and Settings

The use of optional features such as *Power Doors*, the *Robot*, the *Solenoid Valve* and the *Accumulator* is set within the *Other Functions and Settings* screen. Their availability is dependent on your machine set-up.



Press the *Manual* key to activate the *Manual* mode. Switch the HMI display to the *Other Settings* screen by pressing *F7 (Other 1)*.

Set the *Power Door* mode. If activated the *Safety Door* opens automatically (in semi-auto mode only) at the end of the cycle. The operating keys to close and open the door are activated. If this function is disabled the *Safety Doors* will not open automatically and any door opening and closing has to be done manually without the help of the power assisted operating keys.

Please note that manual *Safety Door* operation might require considerable physical strength especially when operating large machines.

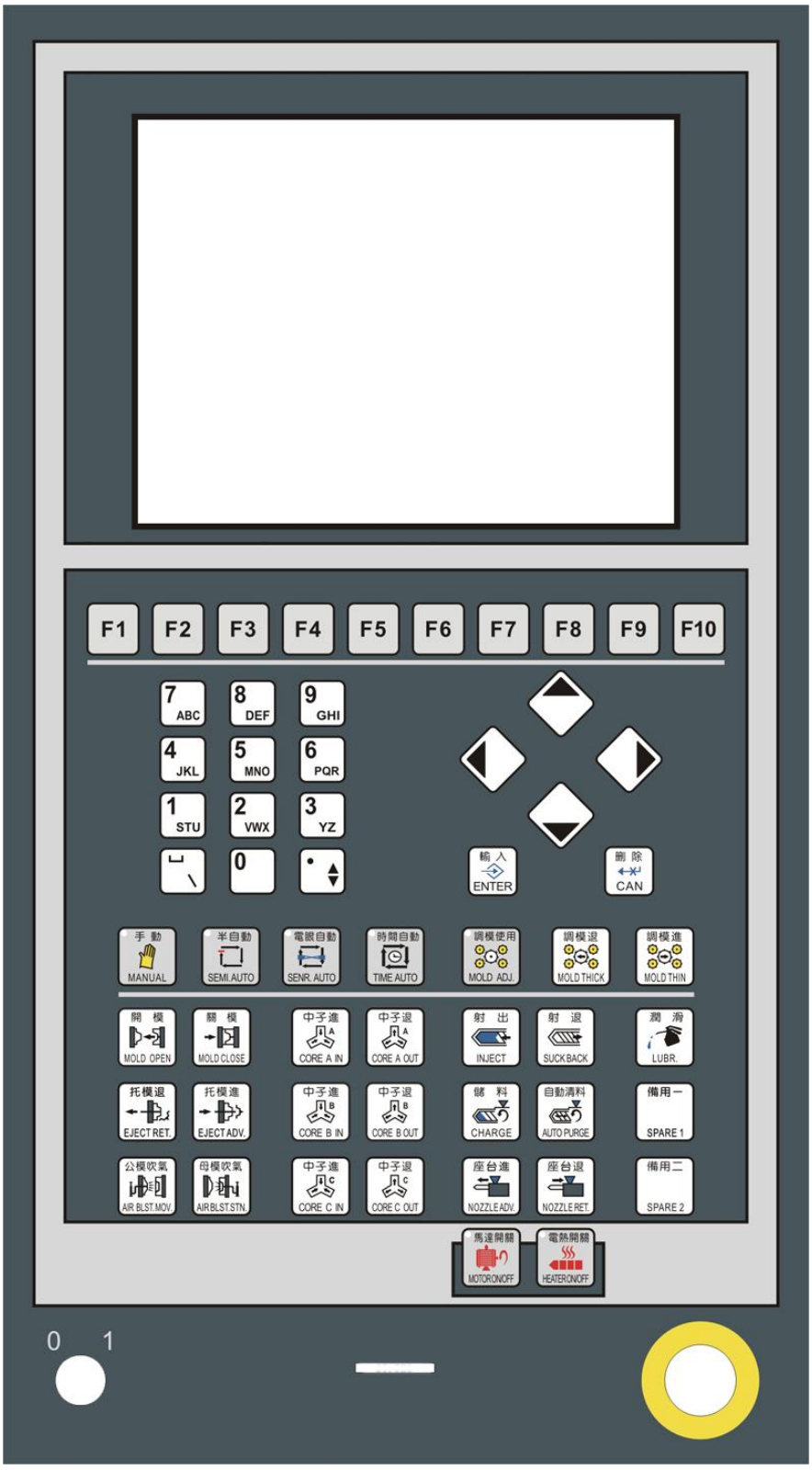
Next, set the *Robot Mode*. Activate if a robot is used for retrieving the product from the mold.

Activating the *Inject Fast* mode allows the use of an optional solenoid valve to achieve higher injection speeds.

The *Accumulator* should be activated if you need to achieve a higher injection pressure and with it the capability of higher injection speeds.

After setting all parameters run the machine in *Manual Mode* to check for optimum machine performance. If you encounter any problems during set-up press the *Manual* key for an emergency reset to stop the operation.

2. Control Panel (HMI)

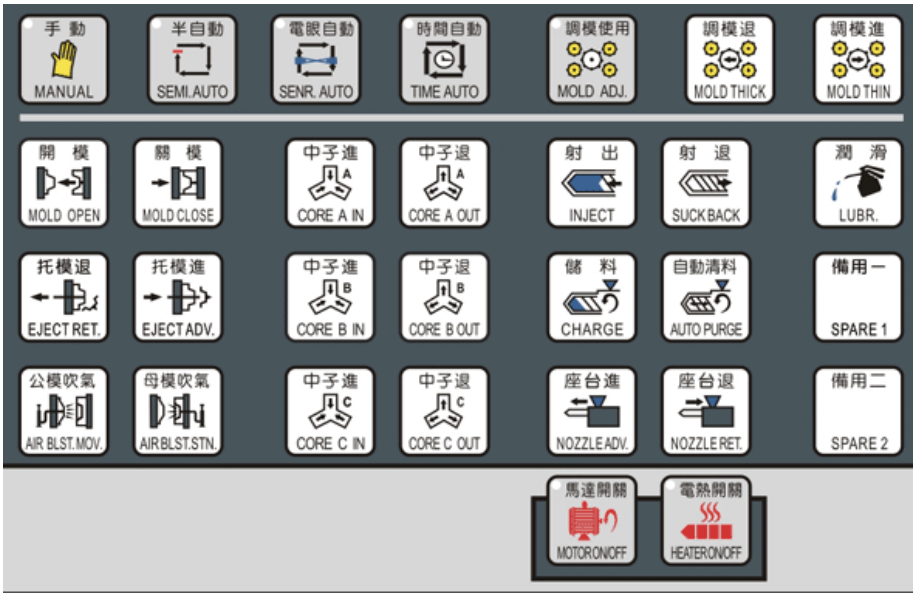


There are two kinds of slots to connect external storage devices, SD slot and USB Slot.

2.1 Control Panel and Keys

The Control Panel is covered with a protective Mylar layer to make the panel water, dirt and abrasion resistant. All keys are operated through type A mechanical contact switches to provide for reliability and a long service life.

2.1.1 Machine Control Panel Keys



The machine control panel keys allow you to switch between different machine operating modes and to manually control the operation of the machine. Nevertheless, even most manual commands will be executed using the stored machine settings. It is therefore important that you verify the settings first to ensure safe machine operation.

2.1.2 Machine Operating Mode Keys

Manual Key: This key has various functions. It is used to change from *Auto Operation* mode to *Manual Operation* mode as well as a reset key for data and alarm settings.

Semi-Auto Key: Press this key to run the machine in *Semi-Auto Operation* mode. After each cycle you have to open and close the safety gate to start the next cycle.

Photo Sensor Key: Press this key to run the machine in *Auto Operation* mode with the Photo Sensor activated. At the end of each cycle, the photo sensor will verify whether the product has been properly ejected from the mold within 4 seconds. If the product is still in the mold the machine will automatically stop and the alarm will sound. The control display will show an '*Ejection Failure*' error message.

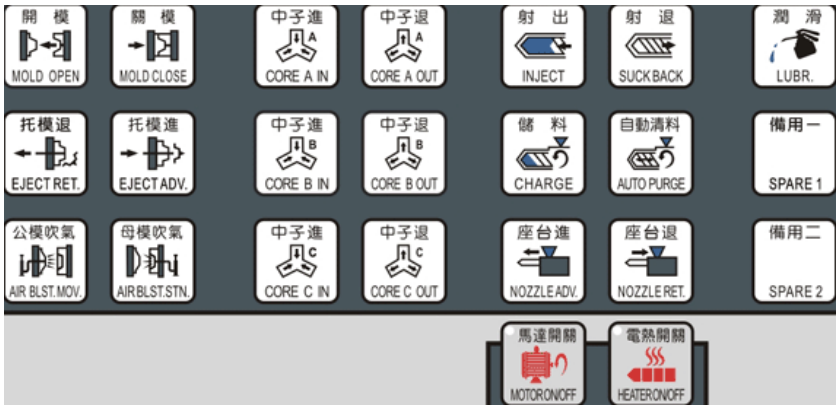
Time Auto Key: Press this key to run the machine in *Auto Operation* mode. Use this operation mode to let the machine execute each cycle automatically. The controller will stop the machine and the alarm will sound in case an error occurs. In this mode the photo sensor is not activated.

2.1.3 Mold Height Adjustment

Manual Mold Height Adjustment On/Off Key: Press this key once to activate the *Manual Mold Height Adjustment* mode. Switch the HMIdisplay to the *Other Settings* screen by pressing *F7 (Other 1)*. This screen allows you to adjust the speed and pressure settings after the mold has been changed.
Use the *Mold Adjustment* keys described in the *Mold Adjustment Keys* section to roughly adjust for mold thickness and to advance or retract core(s) if necessary.
Once you have finished the installation of the new mold, close the safety gate and adjust the pressure, speed and position settings (using the *Eject* screen) for the new mold. After adjusting the settings press the *Manual Mold Height Adjustment On/Off* key again to close the mold. While closing the mold the controller will execute an automatic mold height adjustment until the new settings are reached. Once the automatic adjustment is finished all machine operations will stop and the alarm will sound. This indicates that you can now switch back to manual or automatic operation modes.

Please note that for safety reasons you have to switch to *Manual* mode first by pressing either the *Manual Mold Height Adjustment On/Off* key or the *Manual* key. If you wish to use any other mode, please change to the desired mode after you have switched to *Manual* mode.
If you encounter any problems during mold height adjustment press the *Manual* key for an emergency reset to stop the operation.

2.1.4 Manual Operation Mode Keys



Open Mold Key: While in *Manual Operation* mode, close the safety gate and press and hold this key to open the mold. Once you release the key mold opening will stop. If core(s) are used they will be moved according to the settings. Press *F6 (Cores)* to view the core settings. Please note that you can use the *Open Mold* key in *Manual Operation* mode only.

Close Mold Key: While in *Manual Oper*ation mode, close the safety gate and press and hold this key to close the mold. If core(s) are used they will be moved according to the settings. Press *F6 (Cores)* to view the core settings. In case a robot is installed it must be reset. If the ejector is in knockout position, it will retract before the mold closes. Once you release the *Close Mold* key mold closing will stop. Please note that you can use this key in *Manual Operation* mode only.

Injection Key: To use this key the controller has to be in *Manual Operation* mode with the *Heater* activated. After the pre-set *Barrel Temperature* has been reached press and hold this key to inject resin as desired. The injection will stop as soon as the key is released. The injection will be executed according to the injection settings. Press *F3 (Inject)* to view the settings.

Suck-Back Key: While in *Manual Operation* mode, press this key after resin injection to initiate suck-back. The operation will stop once the key has been released. Suck-back will be executed according to the suck-back settings. Press *F3 (InjSpc)* to view the settings. Please note that you can use this key in *Manual Operation* mode only.

Ejector Retraction Key: Use this key in *Manual Operation* mode to retract the ejector. Ejector movement will stop once the key has been released or the back limit has been reached. Please note that you can use this key in *Manual Operation* mode only.

Ejector Activation Key: Use this key in *Manual Operation* mode to activate the ejector. Before the ejector can be activated the mold has to be opened completely, all cores have to be retracted and the ejector has to be positioned between the limit switches. The ejector will be activated according to the *Ejector* settings. Press *F5 (Eject)* to view the settings. Please note that you can use *Ejector Activation* key in *Manual Operation* mode only. If necessary press the *Manual* key for an emergency reset to stop the operation.

Nozzle Advance Key: Press and hold this key in *Manual Operation* mode to move the nozzle and injection unit forward. Release the key to stop movement. Please make sure the nozzle advance limit switch (located on the machine) is activated to prevent damage as a result of the nozzle colliding with the mold. For safety reasons the nozzle and injection unit will slow down once it is moving close to the mold. Please note that you can use this key in *Manual Operation* mode only.

Nozzle Retraction Key: Press and hold this key in *Manual Operation* mode to retract the nozzle and injection unit. Release the key to stop movement. Please note that the nozzle retraction limit switch is deactivated during this operation to permit maximum injection unit movement. This allows for easy cleaning and maintenance. The nozzle retraction limit switch is only activated while using auto operation modes. Please note that you can use this key in *Manual Operation* mode only.

Charge (Plasticizing) Key: Use this key in *Manual Operation* mode to charge the injection unit. Press and release this key to start charging (plasticizing). The operation is automatically stopped once charging has been completed. If necessary, press and release the *Charge (Plasticizing)* key again to stop charging immediately. If *Suck-Back* is required the controller will initiate *Suck-Back* automatically according to the current settings. Press *F3 (InjSpc)* to view the settings.
Please note that you can use this key in *Manual Operation* mode only.

Auto Purge Key: While in *Manual Operation* mode, press this key to activate *Auto Purge*. The current *Auto Purge* settings will be used. Press *F3 (InjSpc)* to view the settings. Please note that you can use this key in *Manual Operation* mode only. If necessary press the *Manual* key for an emergency reset to stop the operation.

Air Blast Moving Platen Key: Use this key in *Manual Operation* mode to activate the air blast for the moving platen. The current air blast settings will be used. Press *F5 (Eject)* to view the settings. Please note that you can use this key in *Manual Operation* mode only. If necessary press the *Manual* key for an emergency reset to stop the operation.

Air Blast Static Platen Key: Use this key in *Manual Operation* mode to activate the air blast for the static platen. The current air blast settings will be used. Press *F5 (Eject)* to view the settings. Please note that you can use this key in *Manual Operation* mode only. If necessary press the *Manual* key for an emergency reset to stop the operation.

Lubrication Key: Press and hold this key in *Manual Operation* mode to start the lubrication oil pump (customer installed). Release the key to stop the pump. Please note that you can use this key in *Manual Operation* mode only.

Hydraulic Pump Motor On/Off Key: Press this key in *Manual Operation* mode to start the hydraulic pump motor (customer installed), press it again to stop the motor. Please note that you can use this key in *Manual Operation* mode only.

Heater On/Off Key: Press this key in *Manual Operation* mode to start heating the barrel, press it again to stop heating the barrel. The heater will use the current barrel heating settings. Press *F8 (Temp)* to view the settings. Please note that you can use this key in *Manual Operation* mode only.

2.1.5 Mold Adjustment Keys

Reduced Mold Height Adjustment Key: While in *Manual Mold Height Adjustment* mode press this key to roughly adjust for a reduced mold height (reduced distance between moving and static platen). For continuos platen movement press and hold the key. The platen will move slightly and stop. Keep the key pressed and after a one-second delay the platen will start to move continuously. Release the key to stop platen movement. If you press the key and release it immediately, the platen will move slightly and stop, allowing for micro adjustments. You can repeat this operation until the moving platen has reached the desired position.
Please note that you can use this key in *Manual Mold Height Adjustment* mode only.

Increased Mold Height Adjustment Key: While in *Manual Mold Height Adjustment* mode use this key to roughly adjust for an increased mold height (increased distance between moving and static platen). For continuos platen movement press and hold the key. The platen will move slightly and stop. Keep the key pressed and after a one-second delay the platen will start to move continuously. Release the key to stop platen movement. If you press the key and release it immediately, the platen will move slightly and stop, allowing for micro adjustments. You can repeat this operation until the moving platen has reached the desired position. A limit switch may stop backward movement of the platen to prevent damage to the machine. Please make sure the limit switch (located on the machine) is activated.
Please note that you can use this key in *Manual Mold Height Adjustment* mode only.

Core A In 

Core A Out Keys: Press the *Core A In* key to move in core A or use the *Core A Out* key to pull core A. Any core movement will be executed according to the current settings. Press *F6 (Cores)* to view the core settings.
Please note that you can use this key only in *Manual* mode or in *Manual Mold Height Adjustment* mode. If necessary press the *Manual* key for an emergency reset to stop the operation.

Core B In 

Core B Out Keys: Press the *Core B In* key to move in core B or use the *Core B Out* key to pull core B. Any core movement will be executed according to the current settings. Press *F6 (Cores)* to view the core settings.
Please note that you can use this key only in *Manual* mode or in *Manual Mold Height Adjustment* mode. If necessary press the *Manual* key for an emergency reset to stop the operation.

Core C In 

Core C Out Keys: Press the *Core C In* key to move in core C or use the *Core C Out* key to pull core C. Any core movement will be executed according to the current settings. Press *F6 (Cores)* to view the core settings.

Please note that you can use this key only in *Manual* mode or in *Manual Mold Height Adjustment* mode. If necessary press the *Manual* key for an emergency reset to stop the operation.

2.1.6 Data Entry Keys

The keys described in this section are used for numerical and text input.

Important: In order to avoid any loss of data and/or settings make sure you have saved the current mold set again before loading a new mold. If you fail to do so any settings changes you may have made will be lost.

When you turn off the controller/machine the current settings will be saved as the working mold set. Nevertheless, you need to save the mold set again before loading any new mold set since any changes you made have not been saved in the mold set database, only as the working mold set settings.
It is also important to note that you need to leave the current screen before you turn off the controller/machine since any changes will be saved only after you have left the screen you have used to make the changes. If you turn off the controller/machine without exiting the current screen any changes you may have made within this screen will be lost.

If you are unsure if the current settings have been saved always save the current mold set into the mold set database.

2.1.7 Numerical Keys

Use the number keys to enter numeric values. The controller has a pre-set minimum/maximum for most values that cannot be exceeded. If you try to enter a value that exceeds the pre-set minimum/maximum you will not be able to leave the current entry field until a correct value has been entered.
Pressing *Enter*, *Y* or an arrow key will confirm the input and move the cursor to the next input field. In order to use the numerical keys you have to unlock the key pad by turning the *Num. Lock Key* in the lower left corner of the control panel to position 1.

2.1.8 Text Input Keys

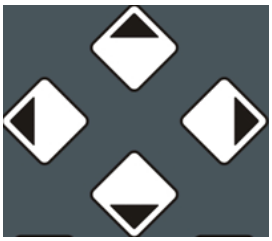
If you need to enter the alphabet for example: A then enter 

press two times then will become A if enter B then press 

twice, and so on

2.1.9 Input Dialog Box Confirm/Cancel Keys

Cursor Keys



Arrow Keys: Use the arrow keys to change the current field selection and to move the cursor. Please note that the arrow keys move the cursor only within the current column (up/down) or line (left/right). If the field you are trying to select does not overlap with the currently selected column or line using the arrow keys will not allow you to jump to the desired field unless you use a combination of left/right and up/down movements.
If you have any problems to select a certain input field by using the arrow keys you can always use the *Enter* or *Y* key to jump between input fields until you have reached the desired field.

Please note that if you use the arrow keys to move to the next input field after you have changed a value the changed value will be kept and the cursor will move into the desired direction.

Enter Key: Press this key to confirm numerical inputs. After confirmation the cursor will jump to the next input field (if available). If you want to move the cursor to another input field press *Enter* to confirm the value in the current field and the cursor will move to the next available field. Repeat this procedure until the cursor has reached the desired input field. A more convenient alternative for moving the cursor may be using the arrow keys.
Please note that if you have changed any settings you have to save the current mold set again before loading a new mold set or turning off the controller/machine. If you fail to do so all settings changes will be lost.

Print Key: Pressing this key opens the *Print Dialog* box.

Cancel Key: Pressing this key cancels the changes you may have made within the current field and resets the current value to "0". If you want to cancel your changes and return to the original value please press the *N* key to avoid a reset to "0".

2.1.10 Screen Selection Keys

The *Machine Settings Panel* provides 10 keys (*F1 – F10*) for screen selection. The entire set of keys has two different menus (A, B). The currently selected menu is displayed at all times at the bottom of the display (see below). Use the *F10* key to toggle between the different menus.

A:

B:

Press the desired key to display the corresponding screen. If this screen has no sub-screens the key will sink in and the background color of the key will change.

Example: After pressing *F1* the key sinks in and the background color changes since the *Overview* screen has no sub-screens.

If the selected screen has one or more sub-screens the key will not sink in and the background color will remain the same. Only the key description will change to indicate the name of the sub-screen. Access the sub-screen by pressing the key again.

Example: After pressing *F3* to display the *Inject* screen the key will not sink in and you will notice no change in background color. However, the *F3* key description will change from *Inject* to *InjSpc*, indicating that pressing the *F3* key again will display the *Auto Purge* (*InjSpc*) screen.

Please note that in some cases you have to quit the currently selected screen/dialog box first by pressing *ESC (N)* before you can access the next subscreen/dialog box.

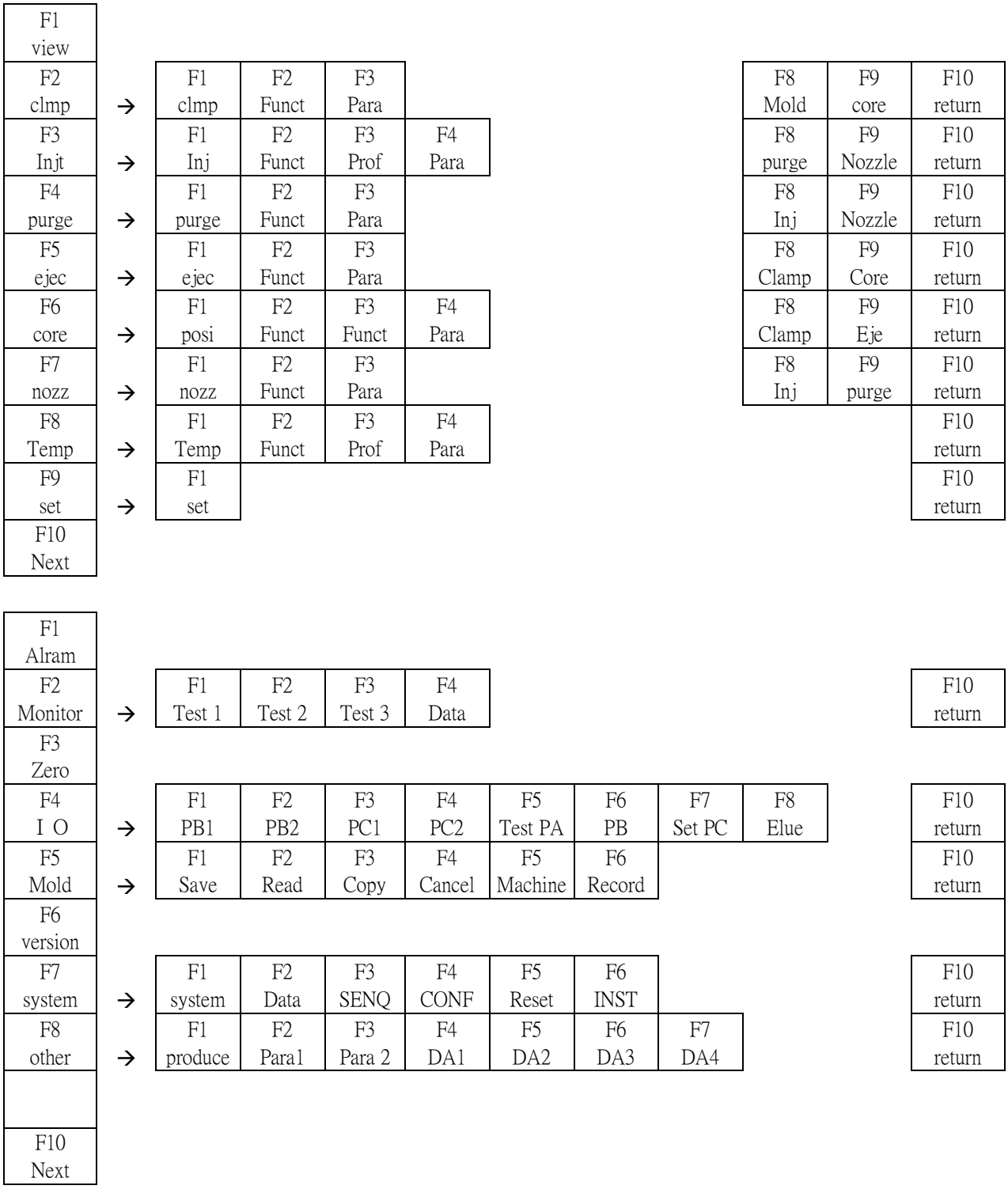
Example: You want to access the *Asgn PC* screen. The *Asgn PC* screen is a sub-screen of the *Asgn PB* screen. After pressing *F4 (Asgn PB)* you will see a dialog box for password entry. Press *ESC (N)* to quit the dialog. You will now notice that the *F4* key label changed to *Assign PC*. If you now press the *F4* key again you will be prompted for your password and ID. Enter it and you will access the *Asgn PC* dialog box.

For detailed information on the exact screen locations please refer to the *Screen Selection* section of this manual.

2.2 HMI Display

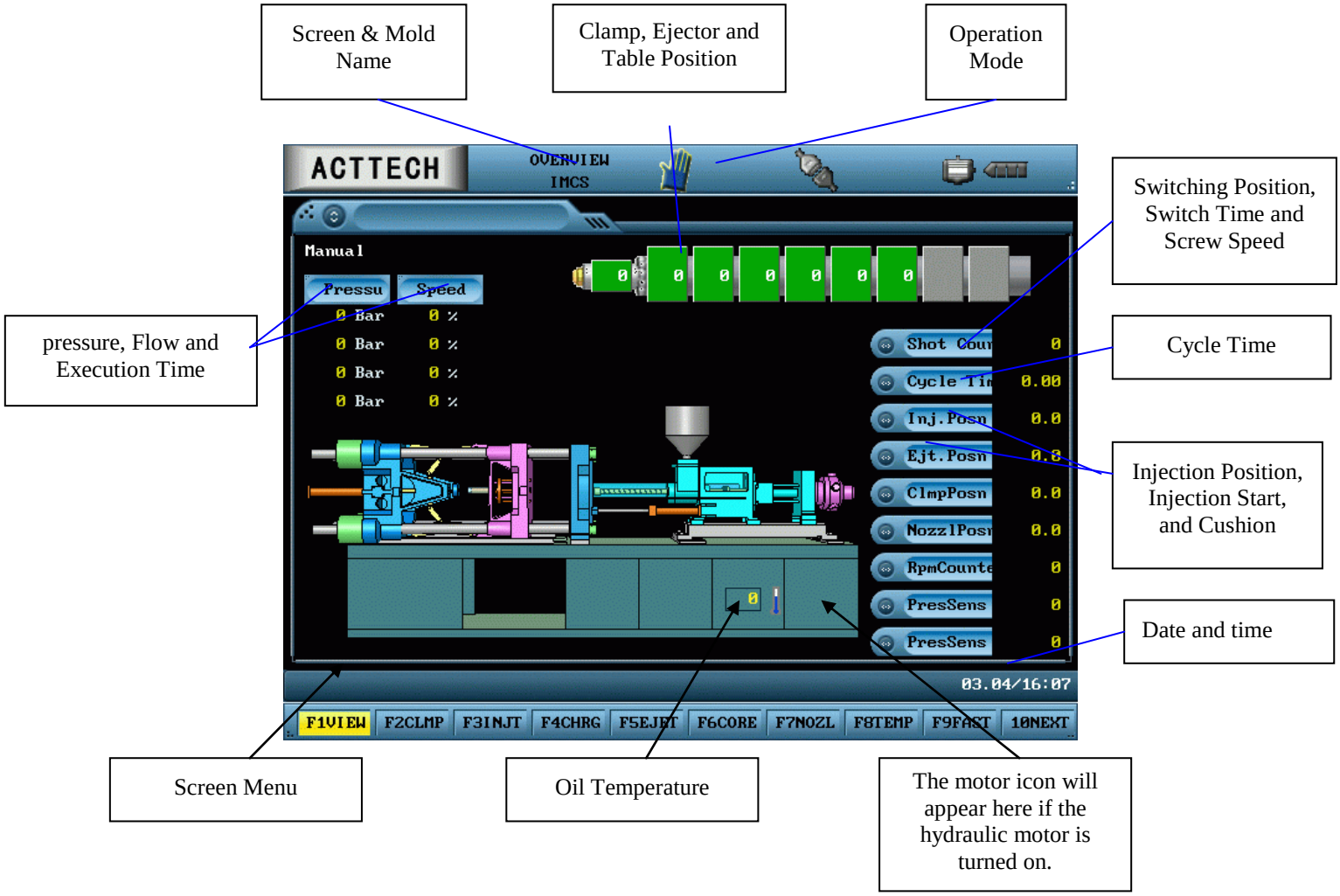
2.2.1 Screen Selection

To access any of the screens described in this section please use this graphic as a reference:



For a more detailed explanation of how to use the screen selection keys (F1 through F10) please refer to the *Screen Selection Keys* section of this manual.

2.3 Control Panel



 MANUAL  SEMI. AUTO  AUTO SENSOR  AUTO TIMER

 AUTO MOLD  MOLD HT ADJUST  MOLD HEIQHT  MOLD THICK

 CLAMP CLOSE  CLAMP OPEN

 EJECTOR ADVANCE  EJECTOR RETRACT

 NozzleFd  NozzleBd  M.P.Air  S.P.Air

 Inject  Suck back  Charge  AutoPurg

 Hd Press  Cooling  Lubricant  Robot

 Not connected  connected

 I-NET not connected  I-NET connected

 Motor on  motor off

 Heater off  heater off

 Alarm

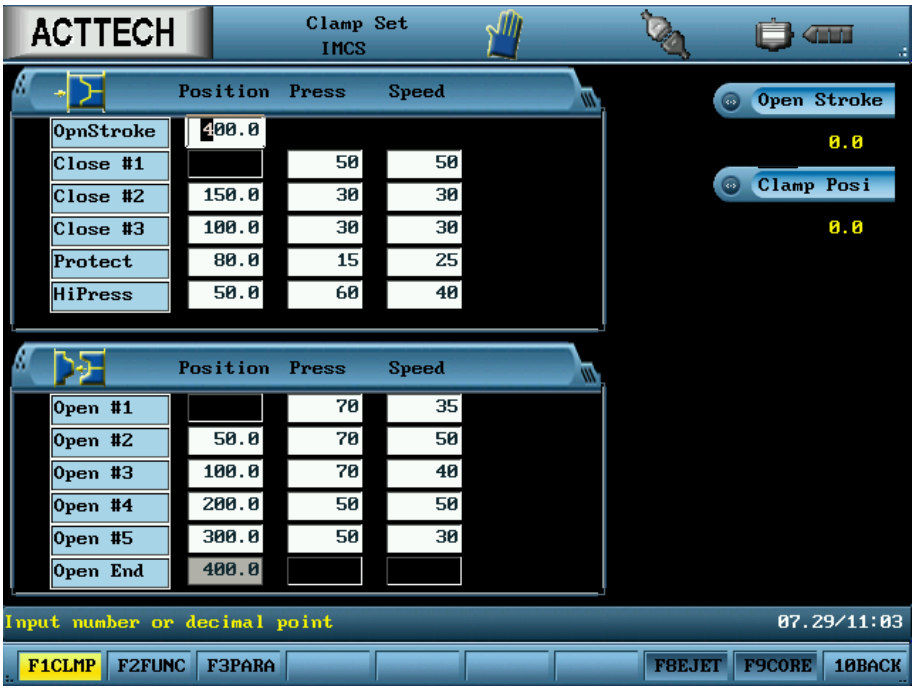
2.4 Clamp Settings

include **F1 Mold**, **F2 Function** and **F3 Data**

2.4.1 Clamp open/close setting

Path- **Main screen → F2 mold → F1 mold**

F1 Mold



Mld-Opn-Stroke (Mold Opening Stroke): Sets the distance the mold will travel between mold closed and mold open positions.

Clp-Posi (Clamp Position): Current clamp (mold) position.

Mold Opening and Closing Settings: *Mold Closing* and *Mold Opening* is divided into 3 phases each. Pressure and speed settings can be adjusted separately for each phase. The transition between each phase is controlled by the corresponding position settings.
The corresponding *Mold Closing* and *Mold Opening* profiles are displayed in the Pressure-Position Graphs on the right hand side (Mold Closing top, Mold Opening bottom).

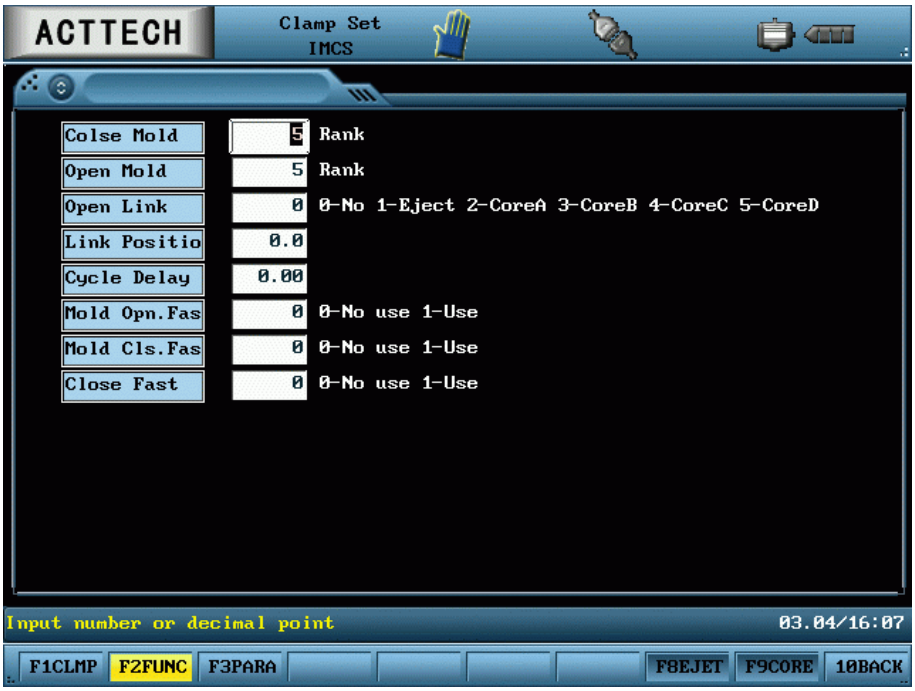
Cls Ult.Hi.Spd (Hi-Speed Closing): Differential high-speed mold closing option.

Auto Cyc-Ps-Tim (Auto Cycle Delay Time): The delay time between molding cycles, usually for robot use.

2.4.2 Clamp set

Path- **Main screen → F2 mold →F2 function**

F2 FUNC



Close fast: if the section has been chosen, it will fasten the speed of processing

Cycle Delay: when the one of the cycle is finished and carry on to the next cycle in-between period

Open Link: can be chosen by preference or chose core (A/B/C)

Link Position: when the mold or core start to action point

Mold Open Fa: when this is been chosen it will speed up the action

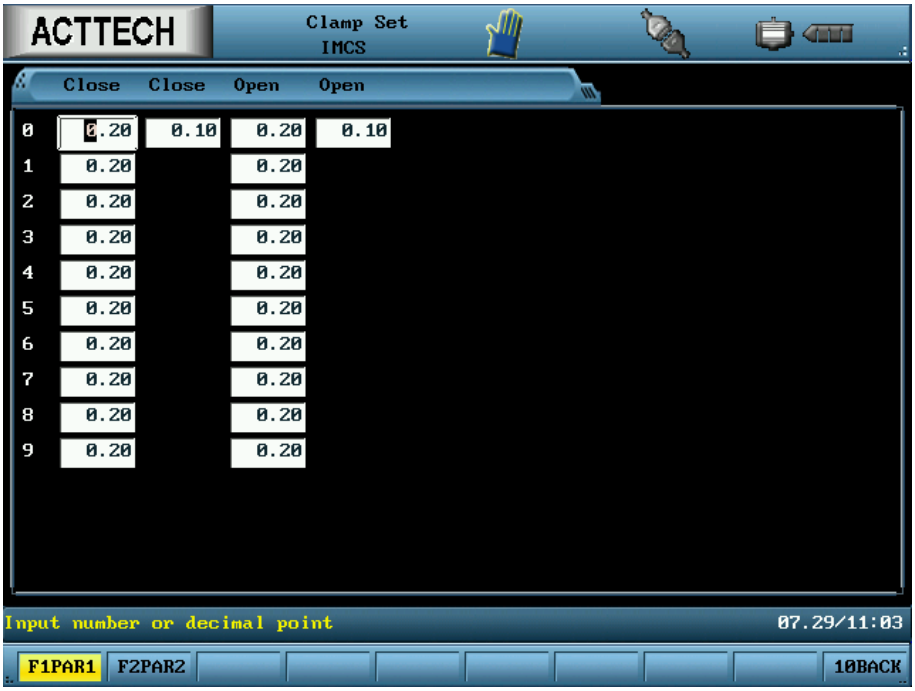
Close Mold: it could set for close mold if need 3 column please enter 3

Open Mold: it could set for open mold if need 3 column please enter 3

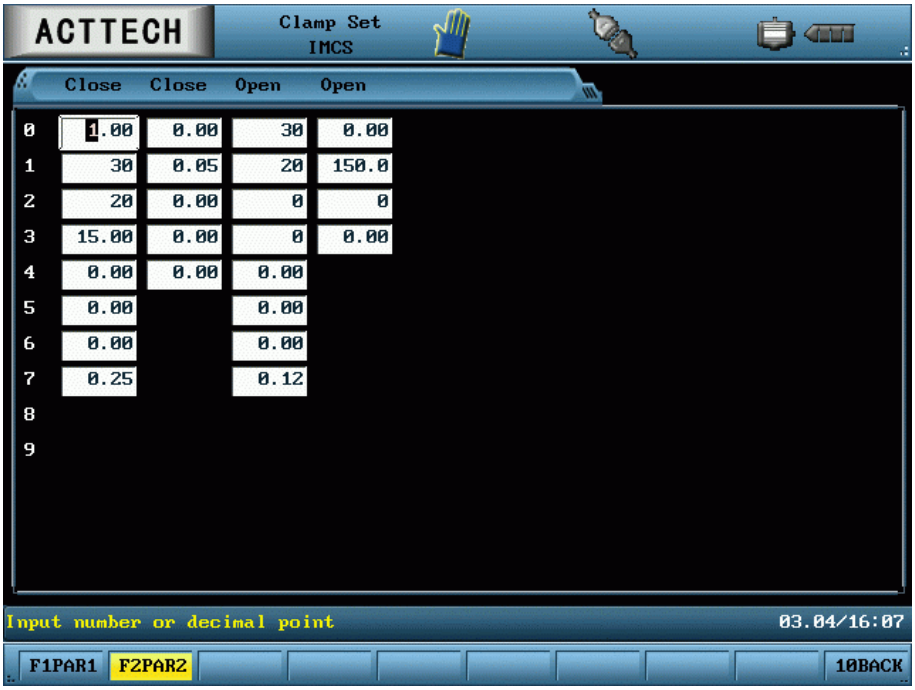
2.4.3 Clamp PAR1

Path- **Main screen → F2 mold →F3 PARA→F1 PAR1/F2 PAR2**

F1 PAR1



F1 PAR2

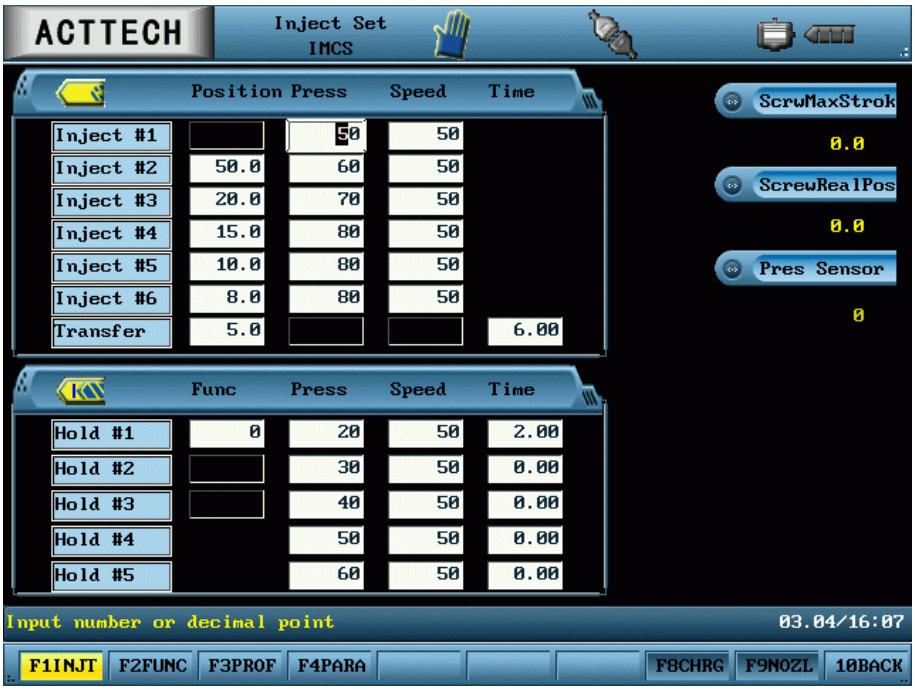


This photo including Clamp Settings and all the other para (detail information please referral to the Para chart)

2.5 Injectio

include **F1 Injt**, **F2 Function**, **F3 Prof** and **F4 Data**

2.5.1 Injection Settings



Hld Prs Tr Mode (Hold Pressure Transition Mode): If the *Time* mode is used the controller will switch to *Hold Pressure* after the pre-set injection time has elapsed. In case the *Position* mode has been selected the controller will switch to *Hold Pressure* after the last pre-set position has been reached. However, the pre-set time is used as a backup to initiate the *Hold Pressure* phase if for some reason the pre-set position cannot be reached.
Please note that you should always set the pre-set time limit higher than the usually required injection time. This avoids poor molding results due to possible resign fluidity variations (poor fluidity could require a longer than usual injection time).

Suck-Back Mode: Depending on the selected mode, *Suck-Back* will be controlled using the stroke or time setting. Choose the value "0" for stroke control and the value "1" for time control.
The same input field (below the *Suck-Back* pressure and speed settings) is used for both, the time and the stroke settings. The field label will change according to the selected mode to indicate the required value.

Screw Pos (Screw Position): Current screw position.

Pressure Hold and Injection Settings: The *Injection* process is divided into 4 - 6 phases, *Pressure Hold* into 3 - 4 phases (depending on customer setup). Pressure and speed settings can be adjusted separately for each phase. For the *Injection* process the transition between each phase (including the transition from *Injection* to *Hold Pressure*) can be controlled by time or position settings. Which settings (either time or position) are used depends on the *Hold Pressure Transition Mode* settings. Please refer to the *Hold Pressure Transition Mode* section in this paragraph for a more detailed explanation on how to use the different transition modes.
The transition between each *Hold Pressure* phase is controlled by the corresponding time settings and is not affected by the *Hold Pressure Transition Mode* settings.
Please note that it is possible to use a combination of pressure and time settings to control the injection process by setting the position value for the transition from *Injection* to *Pressure Hold* to zero. In this case the final position will never be reached and the pre-set injection time will be used as a backup (please refer to the *Hold Pressure Transition Mode* section in this paragraph for more details). However, doing so will disable the monitoring of the current injection data and as a result you will not be able to use the injection cushion for monitoring the injection process. Please refer to the *Monitor Settings 1* section of this manual for more information on monitoring options.

Charge (Plasticizing) Settings: The *Charge (Plasticizing)* process is divided into three phases. You can set the values for backpressure, speed and position individually for each phase.

Suck-Back Settings: Allows you to set the values for suck-back pressure, speed and stroke/time. Set the suck-back stroke/time value to zero if no suck-back is needed.

Suck-back will be executed according to the mode selected. Please refer to the *Suck-Back Mode* section of this paragraph for further explanation.

Dly bef Chrg (Delay Time before Charge): This option may be used for cooling purposes after the injection/pressure hold phases are finished and before charge (plasticizing)/suck back is initiated.

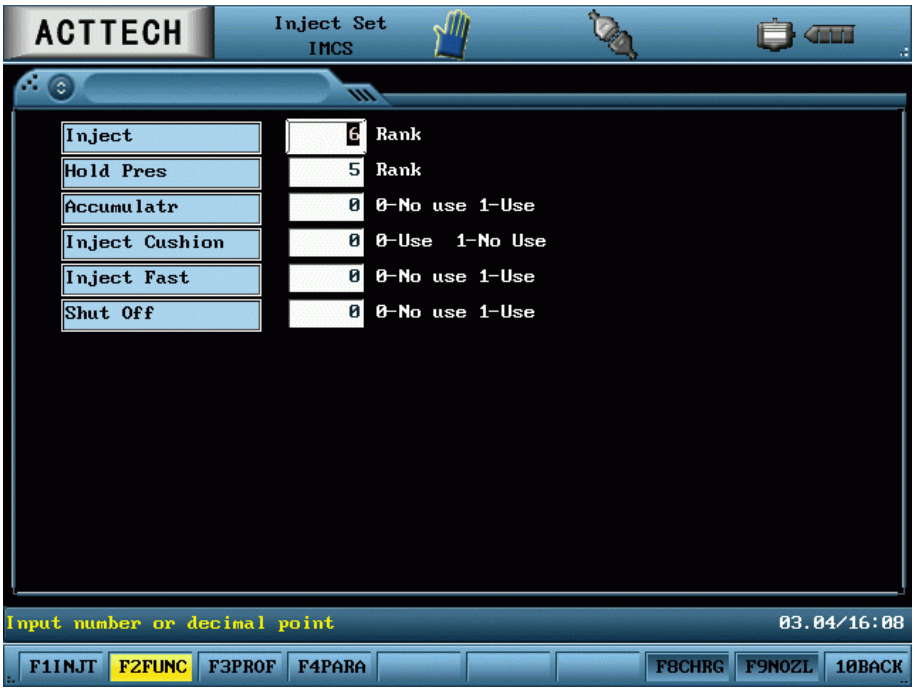
Cooling Time: The set cooling time will be initiated after the completion of injection/suck back and before the mold is opened.

Flow Molding (optional): If you want to charge the injection unit before injection starts, set here the desired charging time. Using the set time, charging starts after nozzle/injection unit advance and finishes just before the beginning of injection.

Injection-Hi (Fast Injection, optional): Set to "1" to activate an optional solenoid valve used to achieve higher injection speeds.

2.5.2 Inject Set

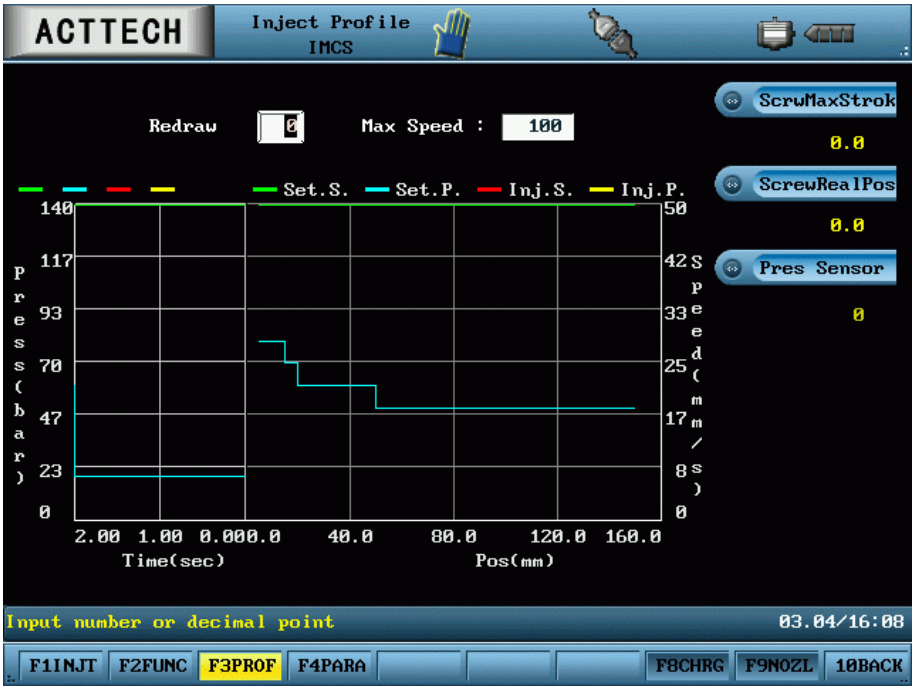
Path- **Main screen → F3 Injt →F2 Func**



Accumulator：when choosing accumulator, the machine can reach to the max speed。
Inj. Shut Off：only can be use if the machine has it
Inject Fast：If you have choosing this function, will increase the valve
Inject cushion：monitor all the molding and calculating the difference 。
Inject：could be divide into three zone if need it then enter **3**。
Hold Pres：could be divide into three zone if need it then enter **3**。

2.5.3 Injection Settings Profile

Path- Main screen → F3 Injt →F3 Prof



Pressure – Position graph of the current injection settings and the values achieved during the current Injection/Hold Pressure cycle. The values are displayed in real-time.

Speed Curve Ratio (optional): This setting allows you to adjust the displayed speed curve if it should exceed the graph's value range (e.g. the curve "leaves" the graph). The preset value is 100.
If you change the ratio to 50 the displayed graph value will actually be 50% of the true value. This allows you to flatten the speed curve if some of its values should exceed the values indicated by the graph.

Example:

You are reading off the peak of the injection speed. Taking the highest point of the curve you go to the right border of the graph to read off the corresponding value. If the value is 60 and the Speed Curve Ratio is 100 then the actual peak injection speed would be 60. If you now set the Speed Curve Ratio to 50 you will notice that the curve becomes considerably flatter. When reading off the peak speed again you will find the corresponding value to be 30 (50% of the true value which is still 60).

Set P (Set Pressure): The black line indicates the preset pressure for Injection and Hold Pressure.

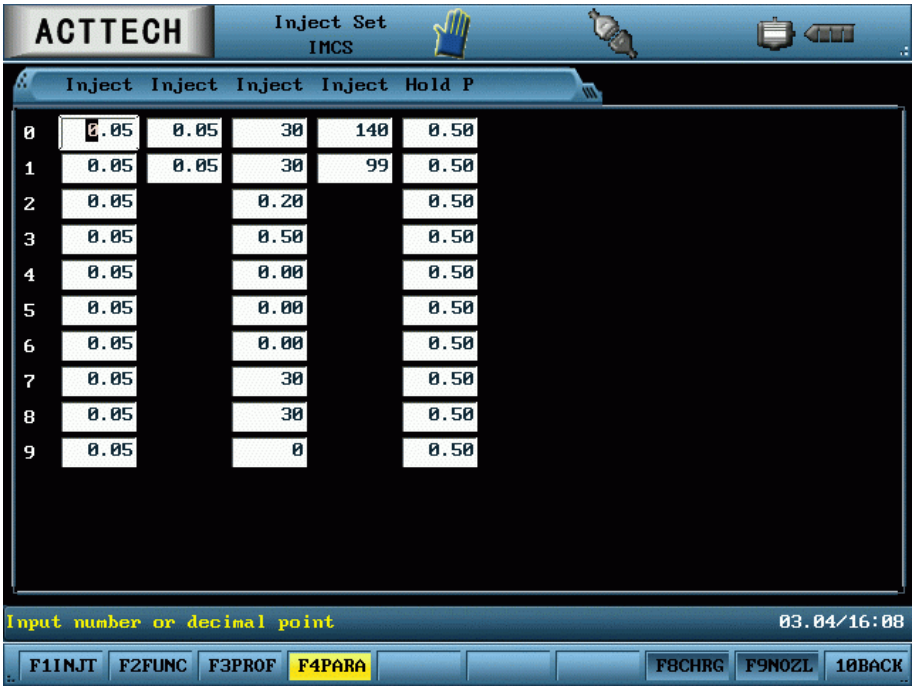
Inj P (Injection Pressure): The red line indicates the actual pressure achieved during the last Injection/Hold Pressure cycle.

Inj S (Injection Speed): The blue line indicates the actual injection speed achieved during the last injection cycle.

2.5.4 Injection Settings Profile

Path- Main screen → F3 Injt →F4 Para

F4 PARA



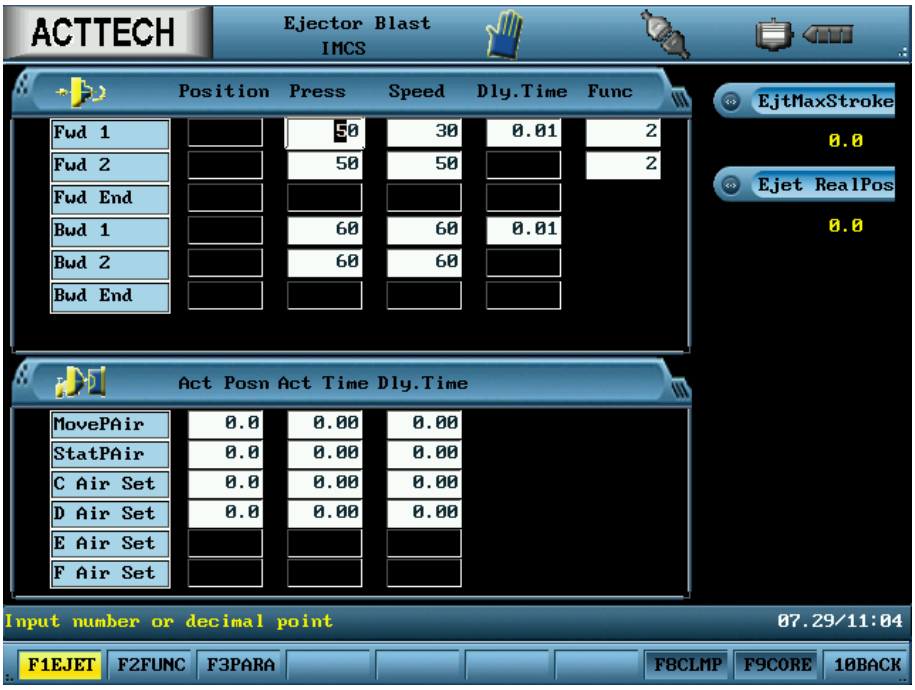
This photo including Injection Settings and all the other para (detail information please referral to the Para chart)

2.6 Ejection

include **F1 Injt**, **F2 Function**, **F3 Prof** and **F4 Data**

2.6.1 Ejector Settings

Path- **Main screen → F5 EJET →F1 EJET**



Eje.Posi (Ejector Position): Current ejector position.

Open End Pos (Opening End-position): The currently set end-position for mold opening.

The initial ejection is divided into two phases that can be controlled separately. You can set pressure, speed and activation position individually for each phase. If you require additional cooling of the mold product after mold opening set the delay time for ejector activation accordingly.

The *Bwd Delay* time refers to the time the ejector will stay in the forward end position before it is retracted.

Position: Set here the end position for ejector retraction between repeated activation (in case of multiple ejector activation). Please note this position is relative to the absolute retraction end position that is used after final ejector activation and determined by the transducer zero point setting.

Eject Mode (Ejection Mode): The *Hold* mode is used during semi-automatic operation. The ejector moves forward according to the ejector settings and the product is dropped or taken out. After the safety gate has been opened and closed the next cycle will start.

In *Cnt Nb* (Count Number) mode the ejector is activated according to the *Ejector* and *Ejection Count* settings. This mode is usually used for automatic machine operation. It does not require the opening and closing of the safety door to continue the production cycle.

If you use the *Vibr* (Vibration) mode the ejector will be activated using the *Vibration* setting as set in the *Parameter 2* screen (setting No. 6).

Please note that if you want to deactivate the ejector you can do so by setting the *Ejection Count* to "0".

Eject Count (Ejection Count): The number of times the ejector will be activated. Setting this value to "0" will deactivate the ejector.

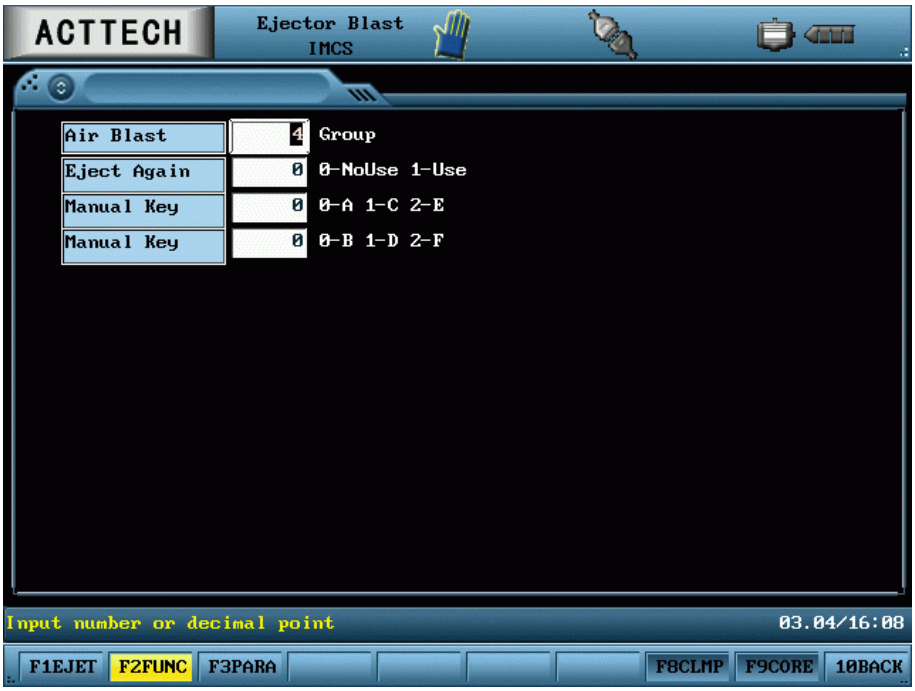
Eject Try Again: This function is used in auto-operation modes. If the mold product cannot be knocked out completely, the alarm will sound and the ejector will be activated again. If the mold product is then successfully knocked out the machine will resume normal operation; otherwise it will stop for trouble shooting.

If this function is not used and the mold product has not been knocked out successfully the alarm will sound and the machine will stop for ejection trouble shooting.

2.6.2 Air Blast Settings

Path- **Main screen → F5 EJET →F1 FUNC**

The machine provides an air blast ejection option for the moving platen as well as for the stationary platen. Set the activation time, position and the delay time (if necessary) according to your preferences.



Clamp P. (Clamp Position): Current clamp (mold) position.

Manual：Manual air blow, Example：when set=0,press this key 

then move platen air blow。When set=1,

Enter this key 

then C set air blow。setting=2, press this key 

then E set air blow。

Manual air blow：Manual air blow key switch, example：setting=0,press this key 

then static blow。setting=1,

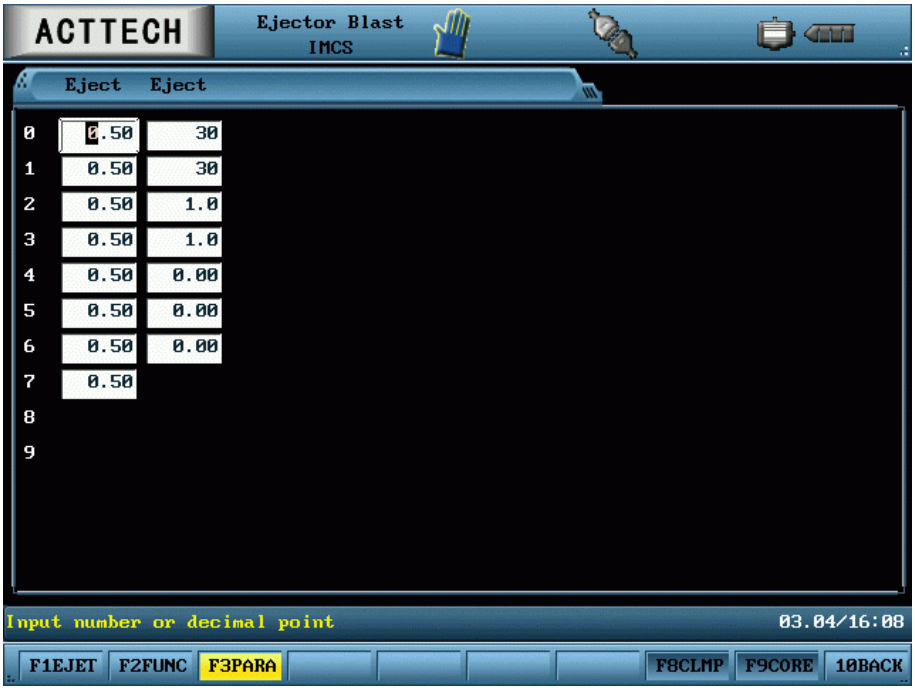
Enter this key 

then set D air blow。setting=2, enter this key 

then F set air blow。

2.6.3 Ejector Para

Path- **Main screen → F5 EJET →F3 Para**



This photo including Ejector Settings and all the other para (detail information please referral to the Para chart)

2.7 Core Settings

Depending on your setup your machine may be equipped with up to 3 cores (A, B and C). Each core is controlled separately.

Set the Pressure, Speed, Activation Time, Unscrew Count (if used) and Position values for moving in and retracting each core according to your needs.

ASet/Cntrl: Use the first parameter *(Settings)* to set the operation mode for core A. The second parameter *(Control)* is used to control the movement for core A.

BSet/Cntrl: Use the first parameter *(Settings)* to set the operation mode for core B. The second parameter *(Control)* is used to control the movement for core B.

Settings: Choose the *Core* (1) mode if you want to use a regular core that is moved in and retracted hydraulically. The *Unscrew* (2) mode should be used if your mold requires threads created by unscrewing the inserted core.

Control: In *Core* mode (refer to the *Settings* section of this paragraph) you can either use *Cycle* control or *Time* control. In *Unscrew* mode you can either use *Time* control or *Count* control.

Using *Cycle* control allows you to control the core movements by limit switches for end-position control (for insertion and retraction). At the pre-set point during the production cycle the core(s) will move in/out until the limit switch controlled end-position is reached. Please make sure the limit switches are activated since deactivated switches will cause the machine to stop (if *Cycle* control is selected).

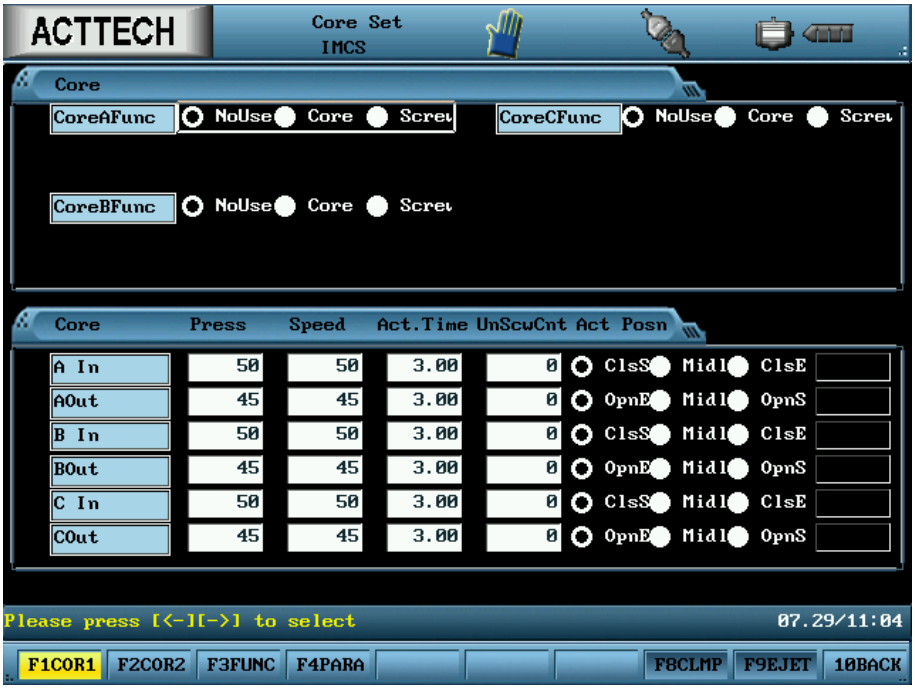
Time control uses time settings for core insertion and retraction. At the pre-set position during the production cycle the core(s) are moved in/out for the set period of time. Therefore core movement (travel) is not controlled by end-position but by time. As a result you will not be able to rely on the protection of limit switches.
Accordingly, in *Unscrew* mode the *Time* control is used to set the time core unscrewing is activated (e.g. for creating threads).

Count control uses the pre-set number of revolutions to control the unscrewing of the core at the set position during mold opening. To use *Count* control you have to make sure a photo sensor for counting the revolutions is installed on the core driving gear.
Please note that *Count* control allows for higher precision than *Time* control.

Unique to Core A is the possibility to activate Core Unscrewing a second time (*2nd Uns.*) at the end of the mold opening cycle. Please note that the second unscrewing can only use *Count* control.

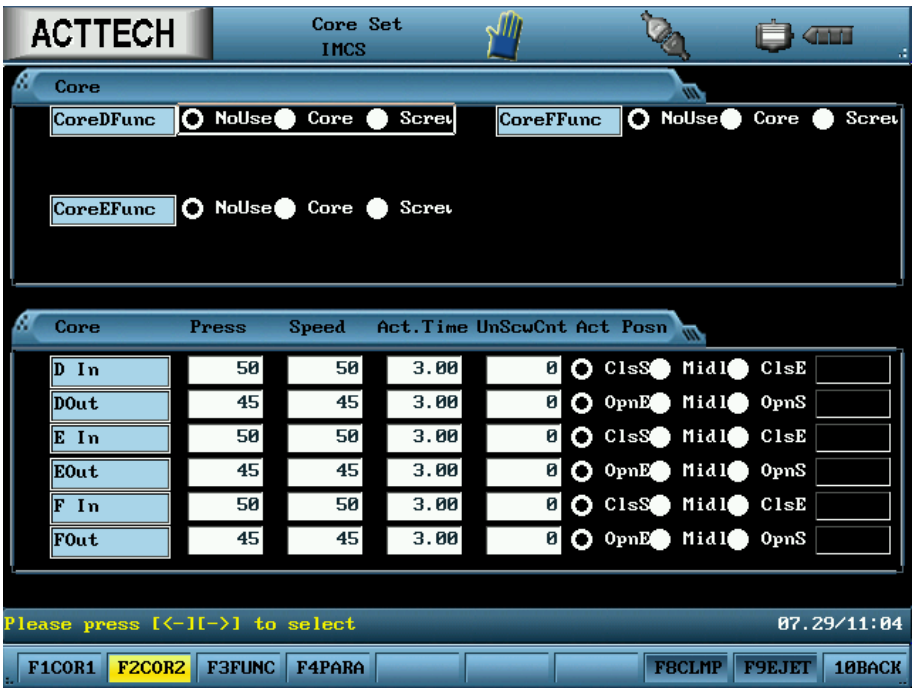
2.7.1 Core A/B/C

Path- **Main screen → F6 CORR →F1 COR1**



2.7.2 Core D/E/F

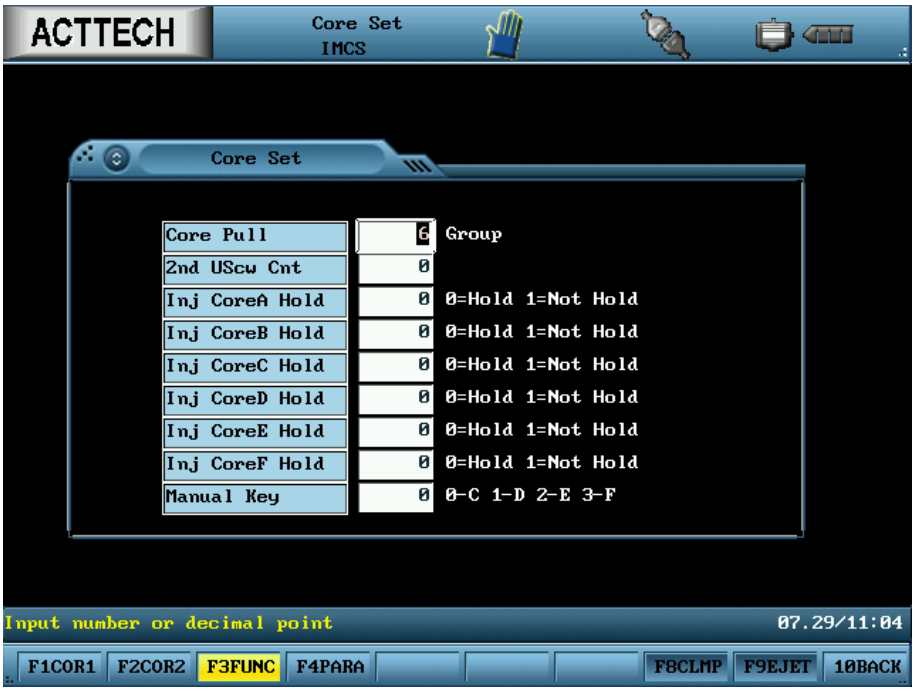
Path- **Main screen → F6 CORR →F2 COR2**



The core setting procedures for core A are identical to the ones for cores A/B. Please refer to the *Cores A/B* section for detailed information on core settings.

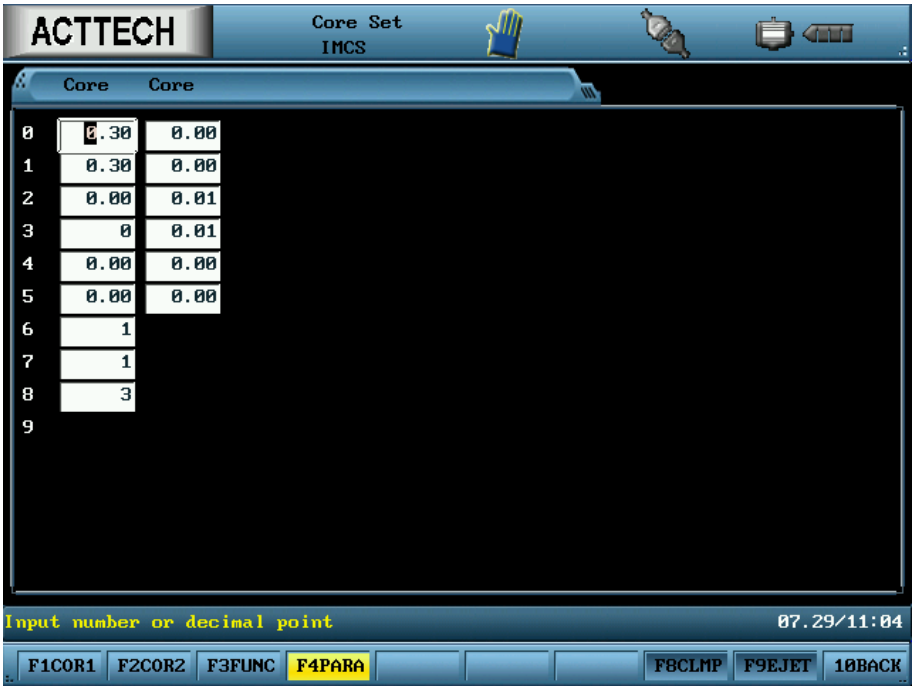
2.7.3 Core FUNC

Path- **Main screen → F6 CORR →F3 FUNC**



2.7.4 Core PARA

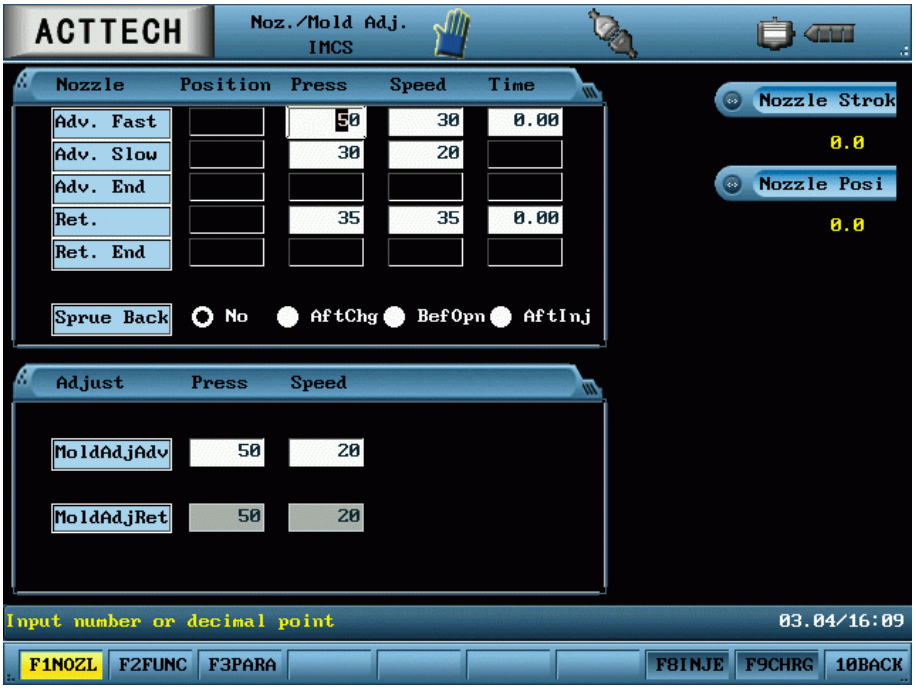
Path- **Main screen → F6 CORR →F4 PARA**



This photo including Core Settings and all the other para (detail information please referral to the Para chart)

2.8 Nozzle Settings

2.8.1 Nozzle/Mold Adjustmen



Nozzle Posi (Nozzle Position): Current nozzle position.

Press (Pressure): Set here the hydraulic pressure for Nozzle advance and retraction.

Hi/Low (High-Speed/Low-Speed): Set here the speed for the corresponding high and low speed movements of the nozzle (injection unit). During advance movement the high-speed settings are used until the pre-set end-position is reached. Thereafter the nozzle will advance using the low-speed settings until it has reached the final injection position.

Please refer to the end-position settings for more information on how to set the end-position to avoid damage to the nozzle/mold.

End Posi (End-Position): For the advance movement the end-position refers to the transition point between high and low-speed. It is important to allow for a safety margin of at least 20 mm between the set end-position and the actual contact position of nozzle and mold (at which the nozzle stops its forward movement and the injection begins).

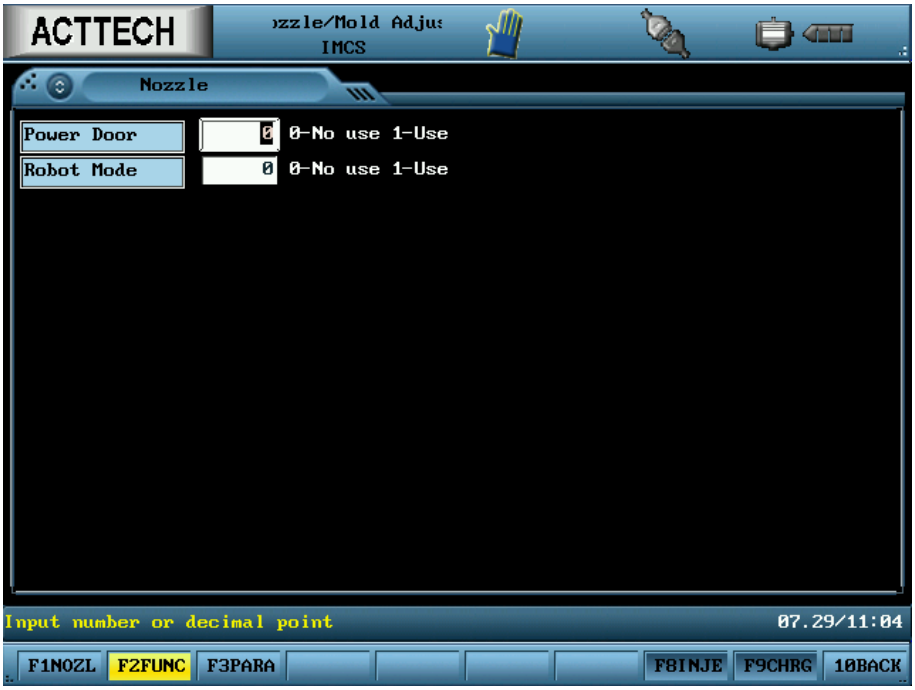
If the end-position is set too close to the contact position of nozzle and mold the nozzle might not slow down enough before touching the mold. The result could be damage to mold and/or nozzle.

Please note that a position setting of “0” refers to the position reached at the end of maximum nozzle/injection unit retraction. As a result the advance end-position is always greater than “0”.

Press (Pressure): Set here the hydraulic pressure for low-speed micro mold height adjustments (advance and retraction). Please refer to the *Mold Adjustment Keys* section for more information on the mold height adjustment process.

Hi (Hi-Speed): Set here the hydraulic pressure for continuous high-speed mold height adjustments (advance and retraction). Please refer to the *Mold Adjustment Keys* section for more information on the mold height adjustment process.

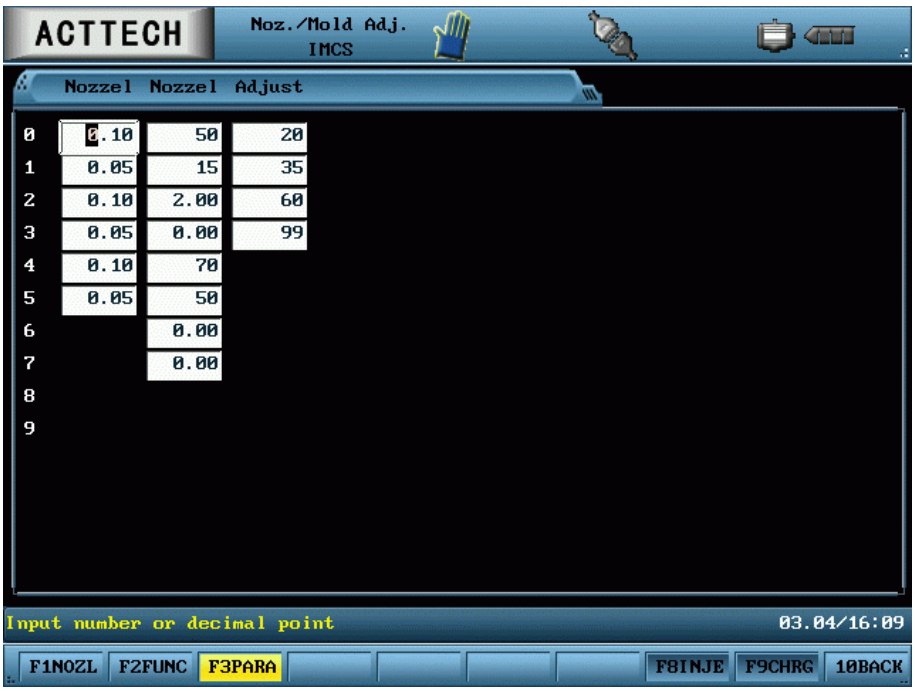
2.8.2 Nozzle/Mold FUNC



Power door: if the setting is base on air move or regular power door, please enter 1 or else the icon on the panel will not work.

Robot Mode: in order to co-operate total auto producing, the robot is taking place of olden style, therefore this computer system in order to operate the action, and also protect molding as well as the robot, before closing mold the system will make sure the robot is back to the ready position.

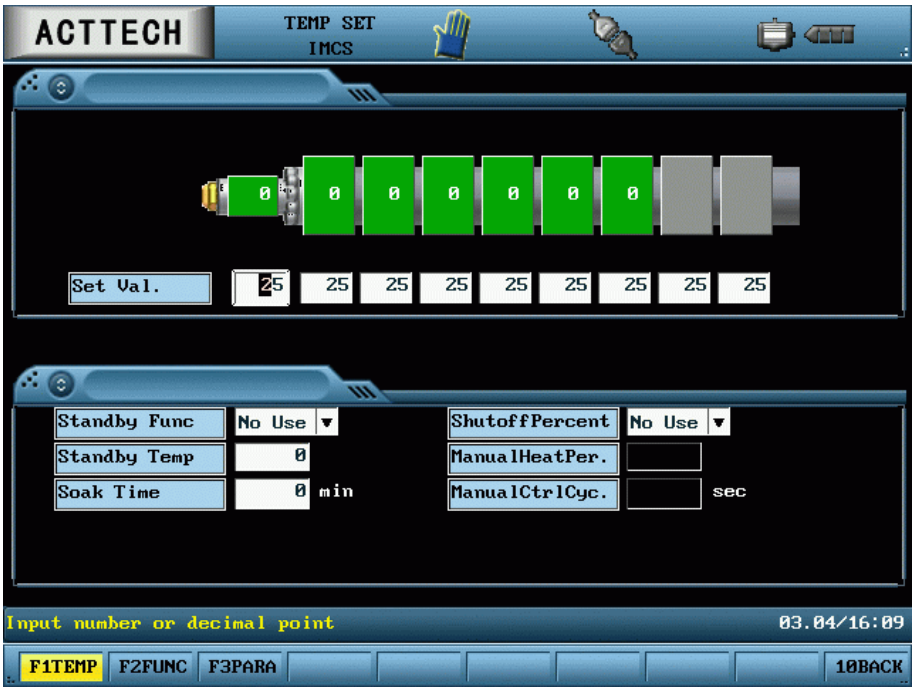
2.8.3 Nozzle/Mold PARA



This photo including nozzle and molding and all the other para (detail information please referral to the Para chart)

2.9 Temperature Control

2.9.1 Temperature Settings



Use this screen to set the temperature for the different barrel heating zones (up to 9 depending on your setup) and to monitor the current status. This screen allows you also to program barrel heater activation using day and time settings.

In case of temperature related malfunctions this screen enables you to analyze possible causes. If the *Real Value* field displays “977” you have either a disconnected or malfunctioning D/A Temperature Card. The value “988” identifies either a problem with the Thermal Wire Interface or the corresponding Temperature Sensor. In case the current temperature is exceeding the normal temperature range (the current temperature is above 450º C) the value “999” will be displayed.

The right hand graph shows the current and pre-set temperature for each of the barrel's heating zones.

Keep Warm: Set this mode to “0” if you want to keep the temperature always in the pre-set range regardless of machine operation. If set to “1” the heater will keep the barrel temperature at half the pre-set temperature during times of inactivity.

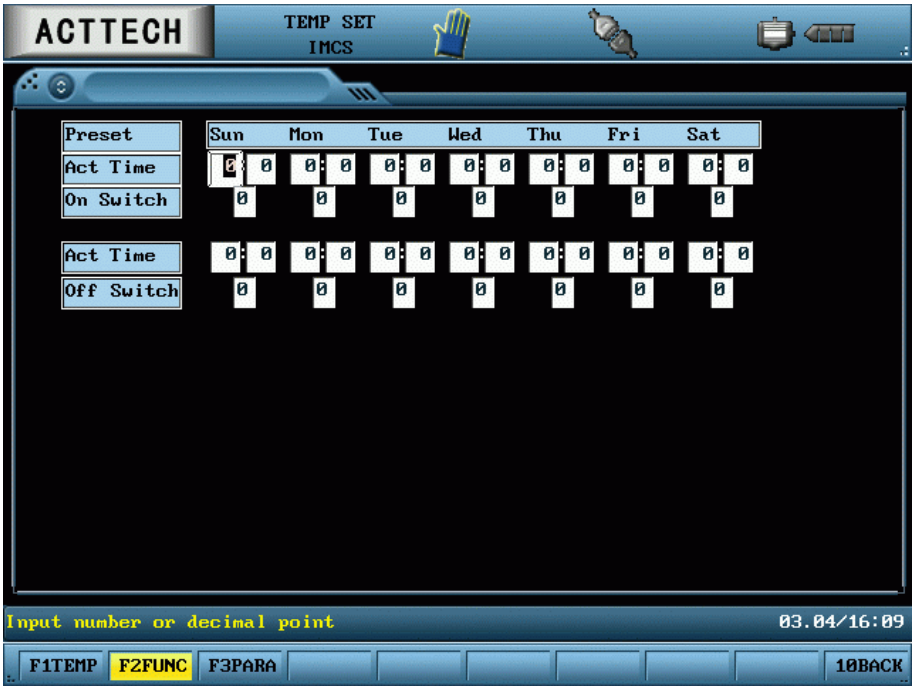
RealVal. (Real Value): The current temperature for the corresponding barrel heating zone. For “977”, “988” and “999” values please refer to above explanation of possible temperature related error messages.

Set Val. (Set Value): Set here your desired temperature value for the corresponding barrel heating zone.

Act. State (Actual State): When the machine is operating this field will give you a quick indication on the current heater status for the corresponding barrel heating zone. The * indicates that the current temperature is within the pre-set range (cushion). The + indicates that the current temperature is below the pre-set range (cushion) and the heater has been activated. The - indicates that the current temperature is exceeding the pre-set value and as a result the heater has been turned off.

Please note that the heater will be turned off immediately once the current temperature exceeds the pre-set value. For current temperatures below the pre-set value heater activation depends on the set temperature range (cushion). To adjust the temperature cushion please go to the *Parameter 2* screen and adjust the corresponding value within the second column of the screen. A cushion value of “20” for example would activate the heater once the current temperature has dropped more than 20°C below the pre-set value.

2.9.2 Temperature func



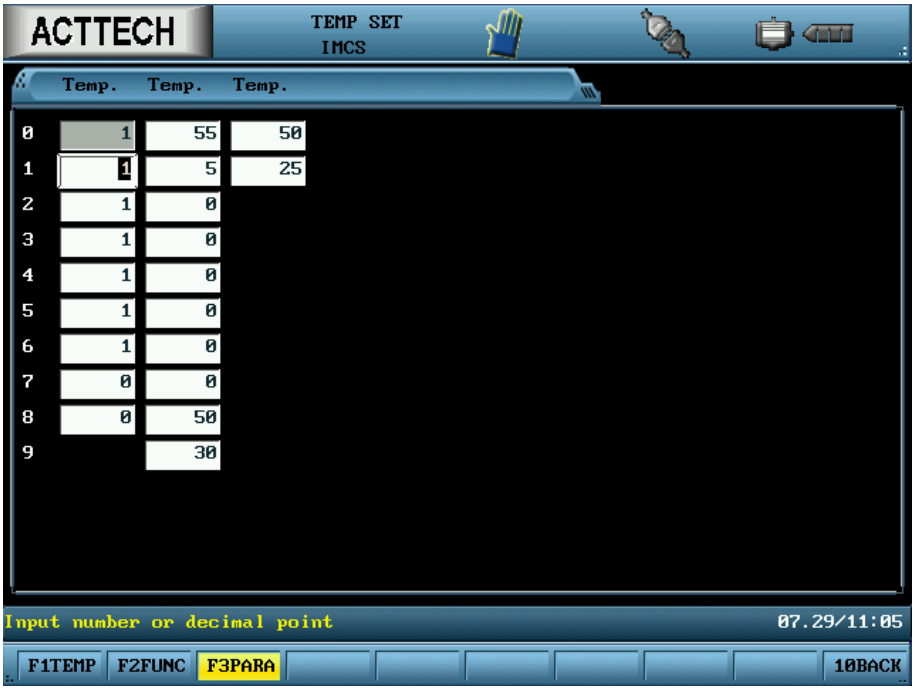
At this photo you could choose the time of heater

Act time: when you are setting the heating temperature, please choose the time and enter 1 to use, when it reach to the setting time the system will atomically start the heater switch.

Stand by time + Stand by temperature: when chose stand by temperature, and the temperature reaches, the system will start the stand by temperature.

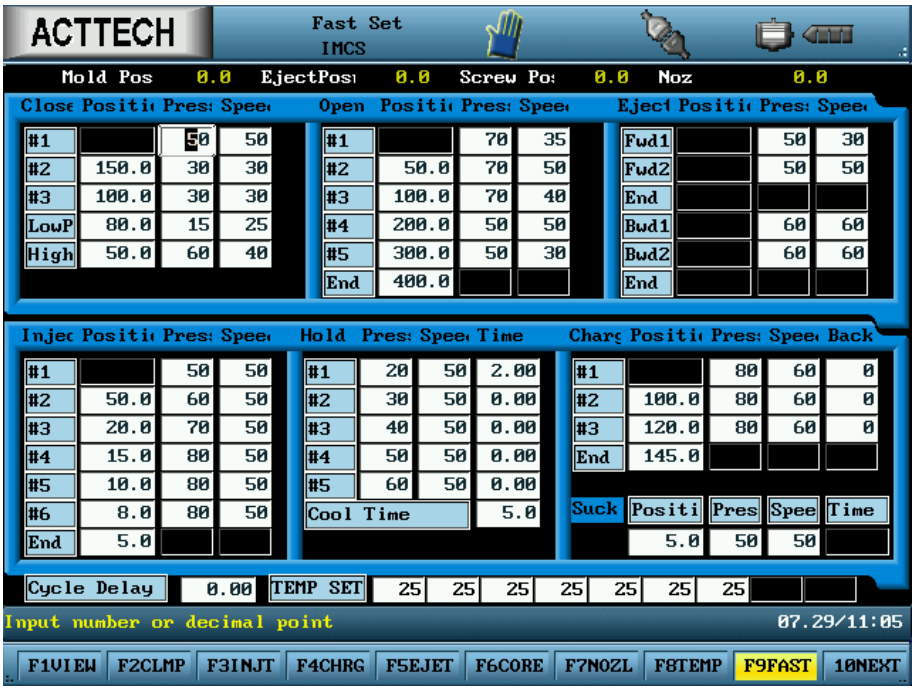
Set here the time and day you want the barrel heater to be turned on to pre-heat the machine before operation. If you want to use the heater presetting set the mode to 1 otherwise disable it by entering "0".

2.9.3 Temperature para



This photo including temperature setting and all the other para (detail information please referral to the Para chart)

2.10 Fast set



This photo can be fast set close mold, open mold, eject mold, inject mold pressing, charge, suck back, and also temperature

2.11 Alarm/Error Message Display Screen

Total Error Count: The total number of errors recorded.

Display Start No: The screen displays 10 error messages a time. If you have more than 10 recorded errors you can enter here the error number for the first error to be displayed on the screen.

Example: If you have 49 recorded error messages and you want to view error 40 through 49 you would enter 40 to display error 40 as the first error. Since the screen can display 10 errors at once you would see error 40 through 49.

Please note that the controller stores only the last 100 error messages error No. 1 being the first one recorded. The recorded errors will be kept even if the machine is turned off. For a list and explanation of all error/alarm messages please refer to the *Alarm/Error Message Index* section of this manual.

Reset: Set this value to "1" if you want to reset the error log.

No: Error number.

Code: Error code to identify the type of error.

Total Cnt (Total Count): Total number of occurrences of this specific error.

Alarm Description: Brief explanation of the error that caused the alarm.

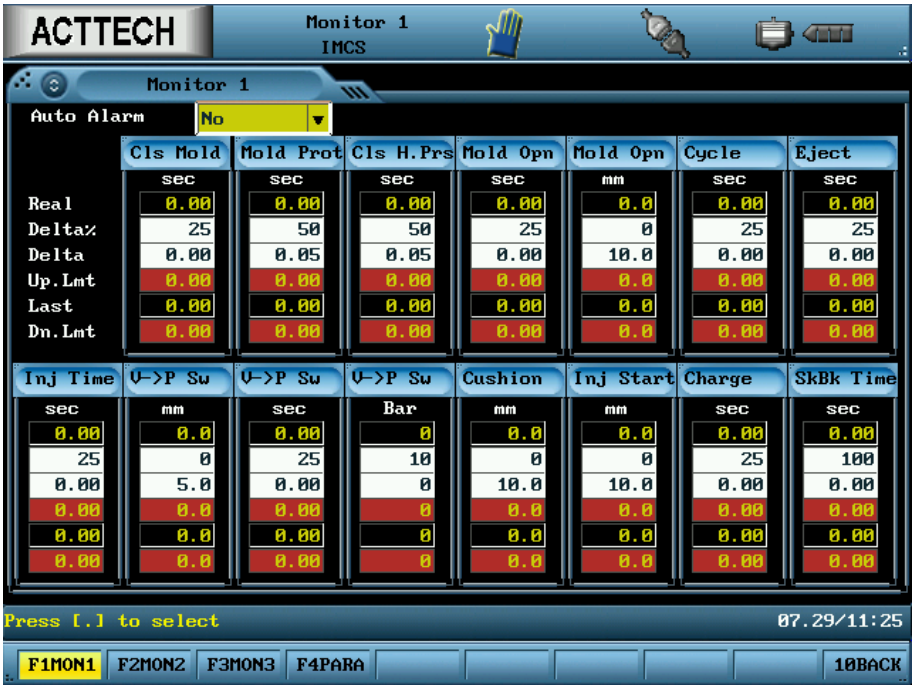
Str.Tim. (Start Time): The time the error occurred and the machine stopped.

Reset Tim (Reset Time): The time the error was reset and the machine restarted.

Please note that errors are only recorded while in *Auto Operation* mode. In any other operation mode the error messages will only be displayed in the bottom left message field of the screen (just above the *F1-F8* keys).

2.12 Monitoring Settings (Automatic Alarm)

2.12.1 Monitoring Settings 1



The HMI and controller provide you with an automatic monitoring and alarm system. The system allows you to set a desired operating range with upper and lower limits (Delta Values) for each production parameter. Once the current parameter value is outside the pre-set range the machine will stop operation and the alarm will sound. For later analysis the monitoring system will record the time and the type of error that caused the alarm.

At the beginning of each operation, the automatic alarm is turned off until the machine has finished the pre-set number of production cycles in *Auto Operation* mode. After the number of pre-set production cycles the automatic alarm will be activated and the achieved parameter values of the last production cycle will be used as reference points for the upper and lower limits (Delta Values) of each production parameter. Should any of the current production parameters during the next production cycle and thereafter be outside the pre-set upper and lower limits (Delta Values) the alarm will sound and machine operation will stop for trouble shooting.

The activation of the automatic alarm function is delayed to allow for a stabilization of the production cycles. At the start of machine operation it is normal that the current production parameters vary considerably from one cycle to the next before they begin to stabilize. You should consider this when setting the number of production cycles before automatic alarm activation to allow for a smooth operation without interruptions.

To adjust the automatic alarm settings use the *Parameter 2* screen and enter the desired value into field No. 0 in the 4th column from the left.

To set the upper and lower limits for current production parameters you can use % values and/or absolute values. These Delta Values are then used in connection with the established Reference Value to determine the upper and lower limits. In case you use a combination of % and absolute values the upper/lower limits will be calculated according to the following formula:

Upper Limit

RV + (RV * x/100) + y

Lower Limit

Where

RV = Reference Value
x = Delta Percentage Value (e.g. 10 for 10%)
y = Delta Absolute Value

RV - (RV * x/100) - y

Since the reference values are not fixed and vary from one machine operation cycle to the next the values are lost once the machine is turned off. They will be re-established at the beginning of the next operation cycle by using the current parameter values to determine the new reference points for the upper and lower limits (Delta Values).

If at some point after establishing the reference values you want to replace them with the currently achieved parameter values (e.g. because of improved production results) you can set the *Auto Alarm* mode at the top of the screen to "2". The controller will then use the parameter values of the last production cycle as the new reference values.

In all other cases the displayed *Auto Alarm* mode indicates, if the *Auto Alarm* has already been activated (mode 1) or if the necessary number of production cycles for establishing the reference values has not yet been reached (mode 0).

Explanation of parameters monitored:

Cls Mold (Close Mold): Total mold closing time.

Mold Prot (Mold Protection): Total time of low speed/low pressure mold closing phase (for mold protection).

Cls H.Prs (Closing High Pressure): Total high pressure mold closing time.

Mold Opn (Mold Open): Total mold opening time.

Eject: Total ejection time.

Cycle: Total production cycle time in *Auto Mode*.

Mold Ope End (Mold Open End): End position after mold opening.

Inj Time (Injection Time): Total injection time.

V->P SW: The position achieved at time of transition from injection to hold pressure.

V->P SW: The injection time elapsed at time of transition from injection to hold pressure.

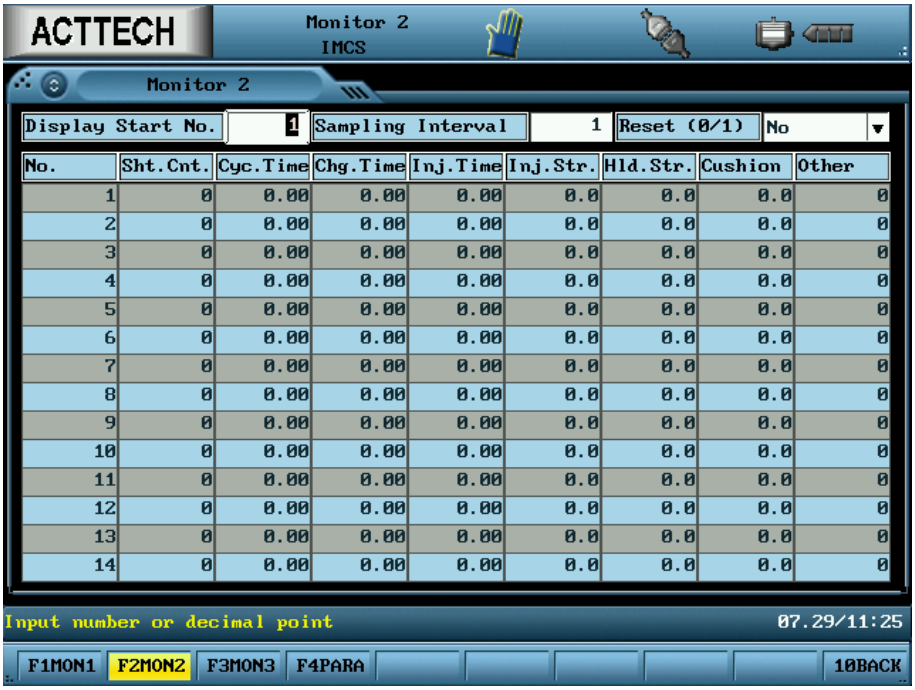
V->P SW: The injection pressure achieved at time of transition from injection to hold pressure.

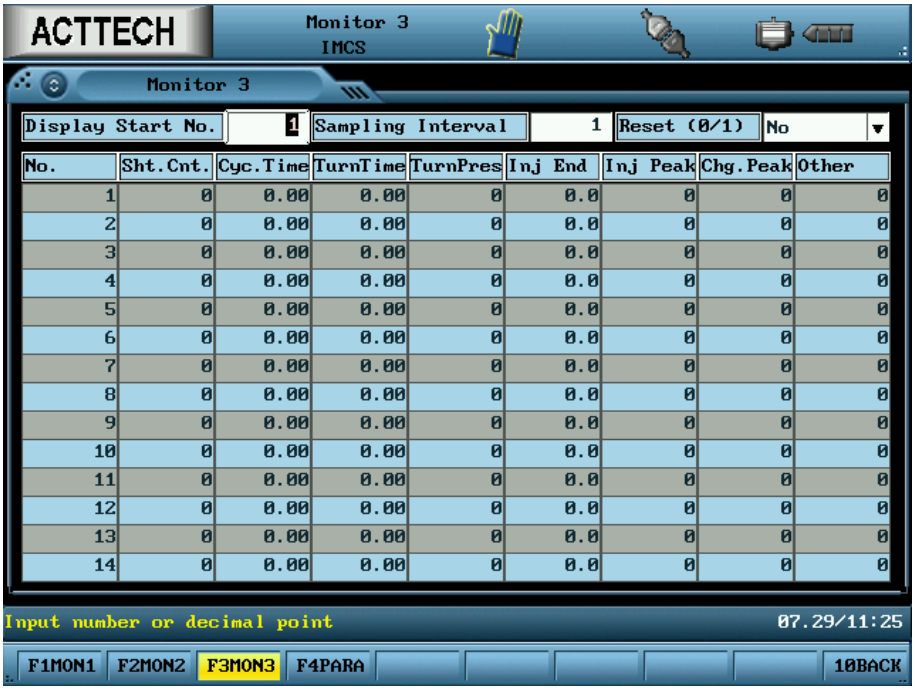
Cushion: End position reached by screw at the end of hold pressure.

Charge (Plasticizing): Total charge (plasticizing) time.

Inj Start (Injection Start): The position reached at start of injection.

2.12.2 Monitoring Settings 2/3 (Production Parameter Comparison)





This monitoring screen allows you to compare the most important production cycle parameters. Use this screen to compare production parameter deviation during machine operation. The parameter comparison of different production cycles allows you to adjust the relevant machine settings to improve overall product quality.

The controller automatically saves the parameters of the last 100 production cycles, displaying 10 records at a time (No. 1 being the first cycle recorded).

Display Start No: Enter the number of the record you want to be displayed first.

Sampling Interval (Cyc): Enter the sampling interval you would like to use (e. g. “3” to display every third record).

Reset (0/1): If you want to reset this monitor screen at any time enter here the value "1" and press enter.

Sht. Cnt (Shot Count): The record number of the corresponding parameter set.

Cycle (Cycle Time): Total duration of this production cycle.

Inj.Tim. (Injection Time): Total duration of injection.

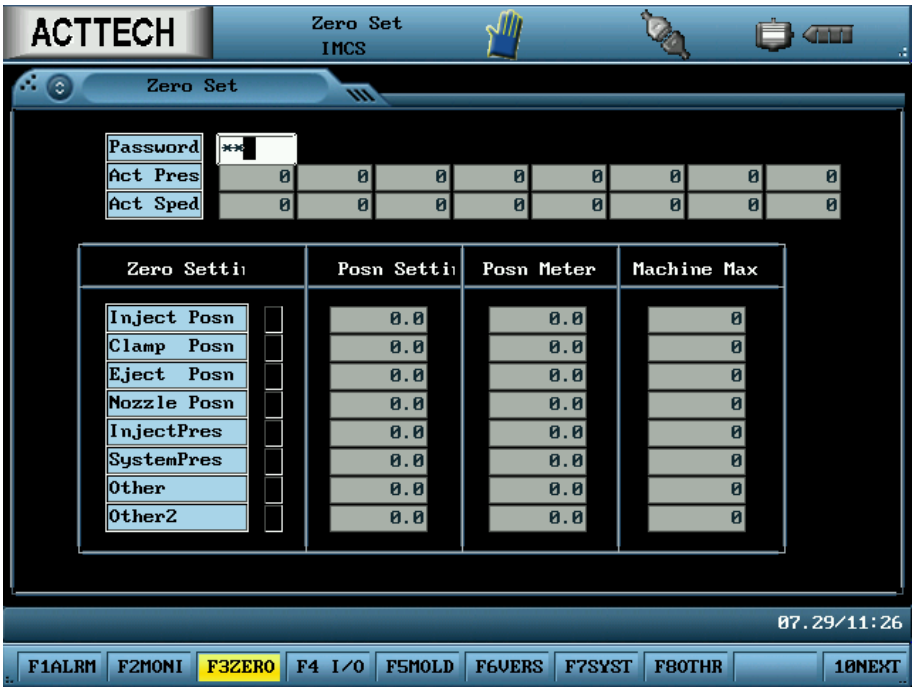
Chg.Tim. (Charge Time): Total charging time.

Inj Start (Injection Start): The position reached at start of injection.

Hld.Str. (Hold Start): The position reached at beginning of hold pressure.

Cushion: End position reached by screw at the end of hold pressure.

2.13 Transducer Zero Point Reset



After the transducer has been changed or certain machine parts have been modified (e.g. the barrel) you have to reset the corresponding transducer's zero point (in manual operation mode):

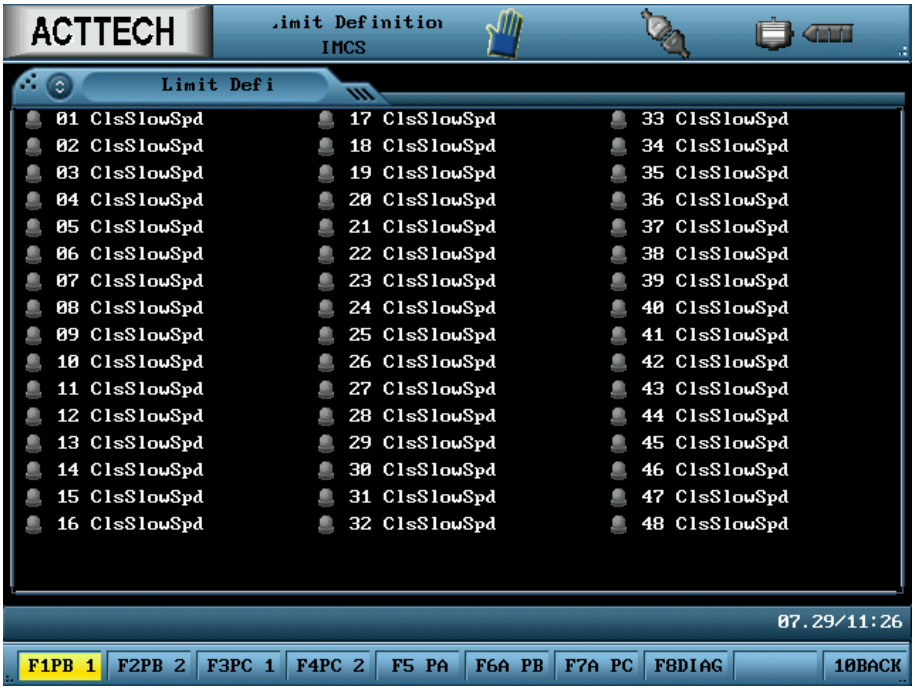
1. When prompted enter “66” as password to access this screen.
2. Move the corresponding transducer to the end position.
3. Reset the relevant settings in the screen to zero by entering the value “1” into the corresponding field and press “Enter”.

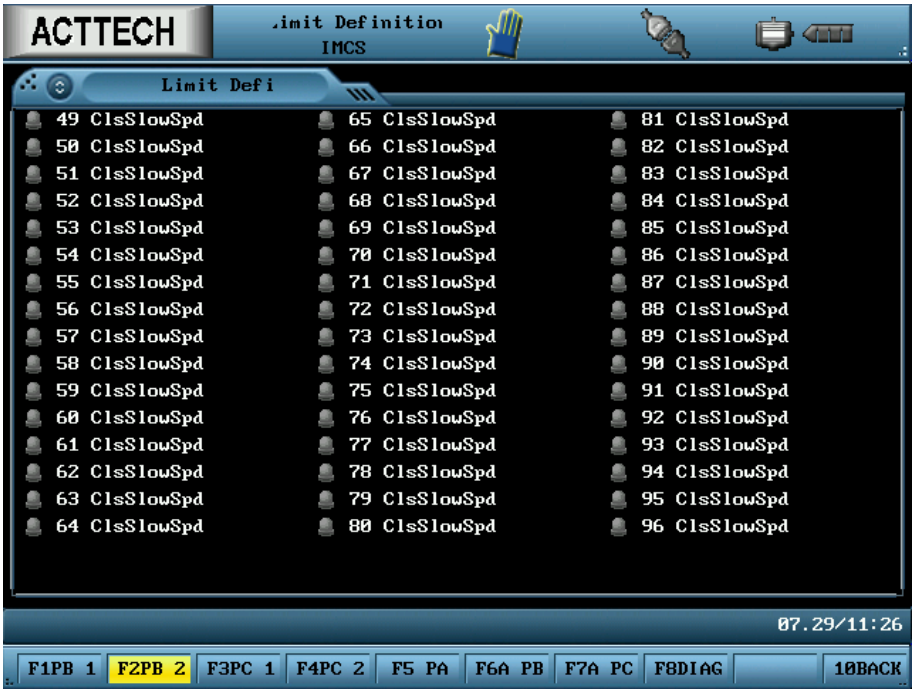
Please note that the number of transducers installed depends on your machine set-up.

2.14 I/O Channel Diagnostics

Include F1 PB1、F2 PB2、F3 PC1、F4 PC2、F5 PA、F6 A PB、F7 A PC and F8 DIAG

2.14.1 Input Channel Diagnostics (PB)



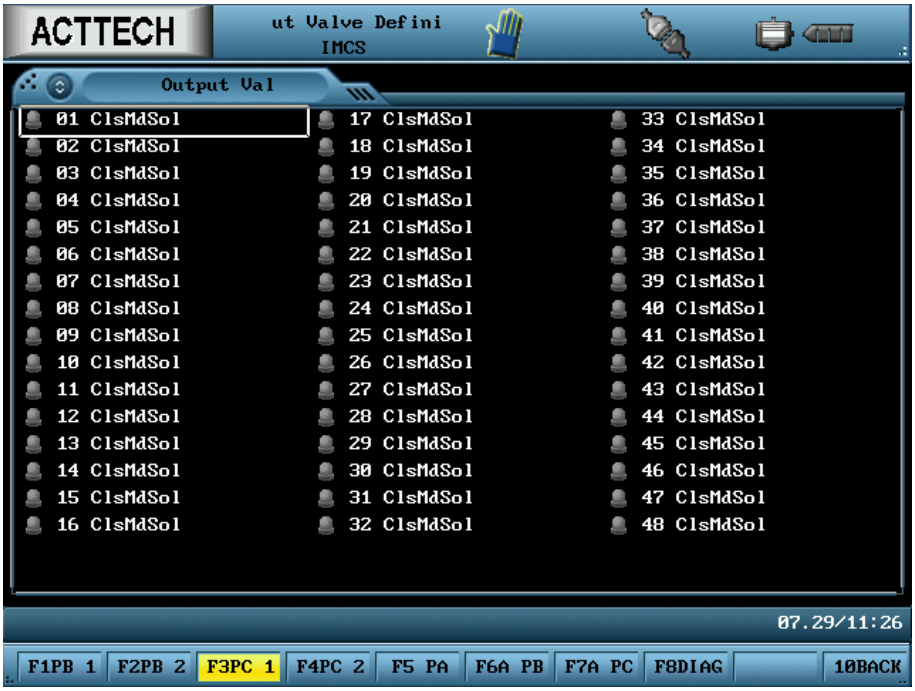


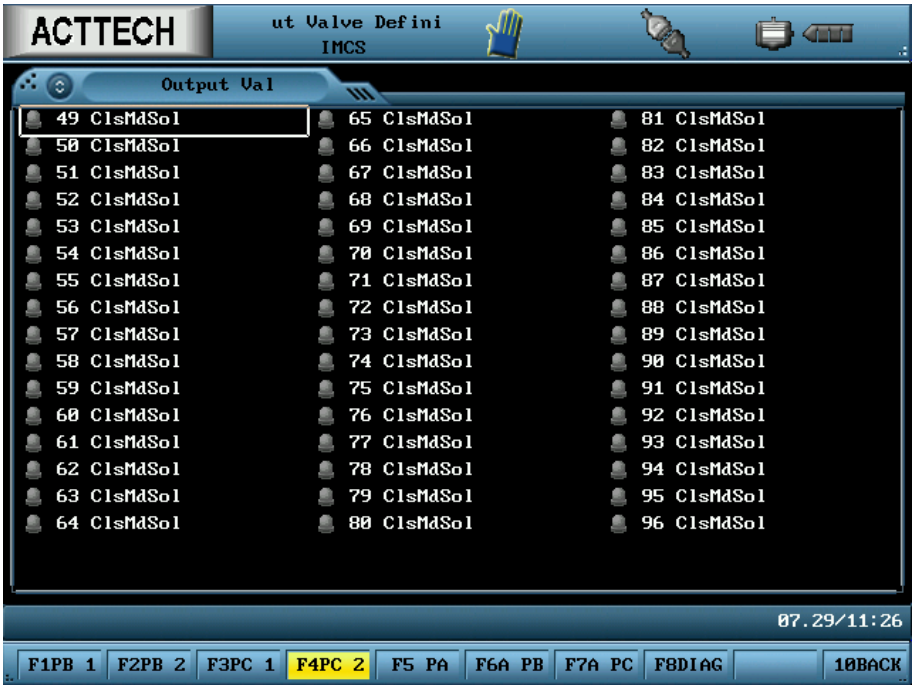
This screen allows you to verify if the controller is receiving an input signal from the relevant sensor. In case you encounter possible input related hardware problems during machine operation switch to this screen and verify, if during the production cycle the controller is receiving an input signal form the sensor in question.

You can identify an input signal by the value “1” displayed next to the corresponding input channel. The value “0” indicates that the input channel is currently not receiving any input signal.

If necessary you can reassign input channels to circumvent possible hardware problems. Please refer to the *I/O Channel Reassignment* section of this manual for further information on how to reassign input and output channels.
The *Input Channels* section contains a list and description of all output channels for your reference.

2.14.2 Output Channel Diagnostics (PC)



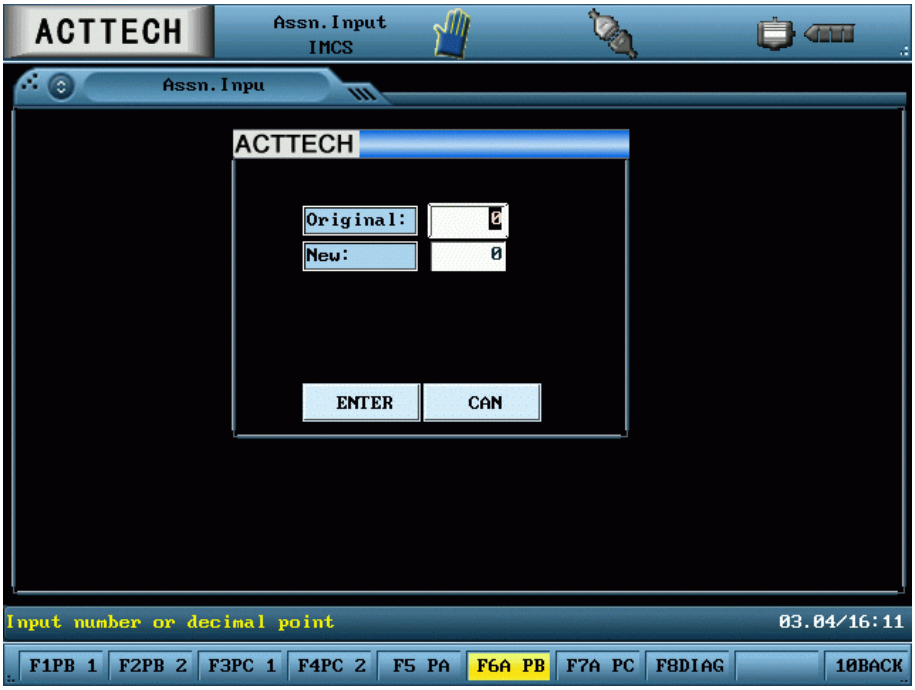


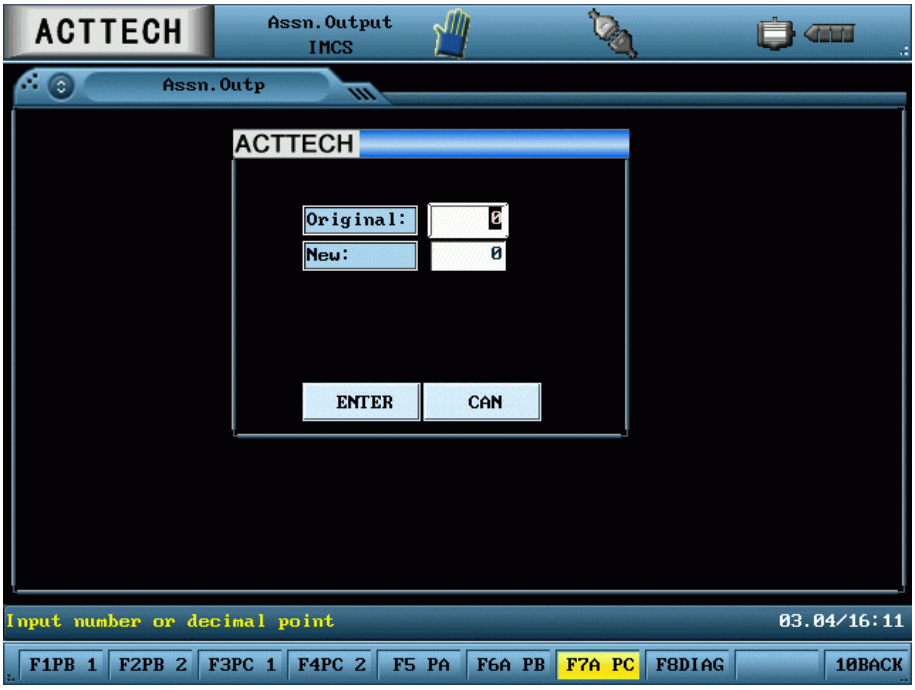
This screen allows you to verify if the controller output signal is reaching the connected hardware. Select the desired output channel and enter the value “1” to activate the connected hardware.
In case of output channel related problems you can choose to reassign any output channel to an unused one. Refer to the *I/O Channel Reassignment* section for further information.

The *Output Channels* section contains a list and description of all output channels for your reference.

Please remember to reset the value(s) you may have changed to "0" after you have finished the output channel check.

2.14.3 I/O Channel Reassignment

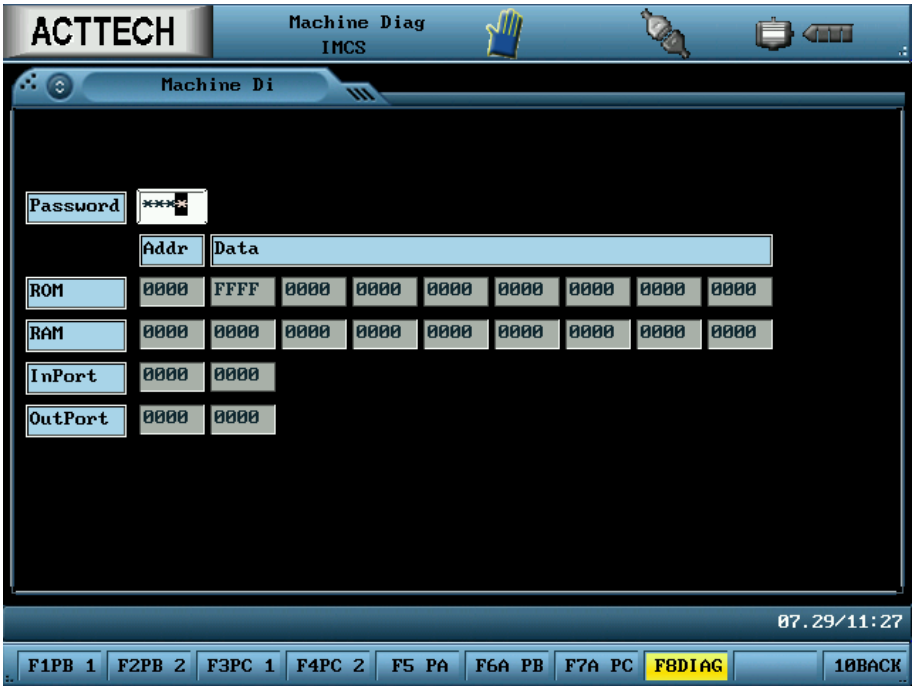




If for some reason (e.g. a hardware problem) you want to change any input or output channels you can use this screen for reassignment to an unused input/output point.

Please refer to the *I/O Channel Index* section for a list and description of all I/O channels available.

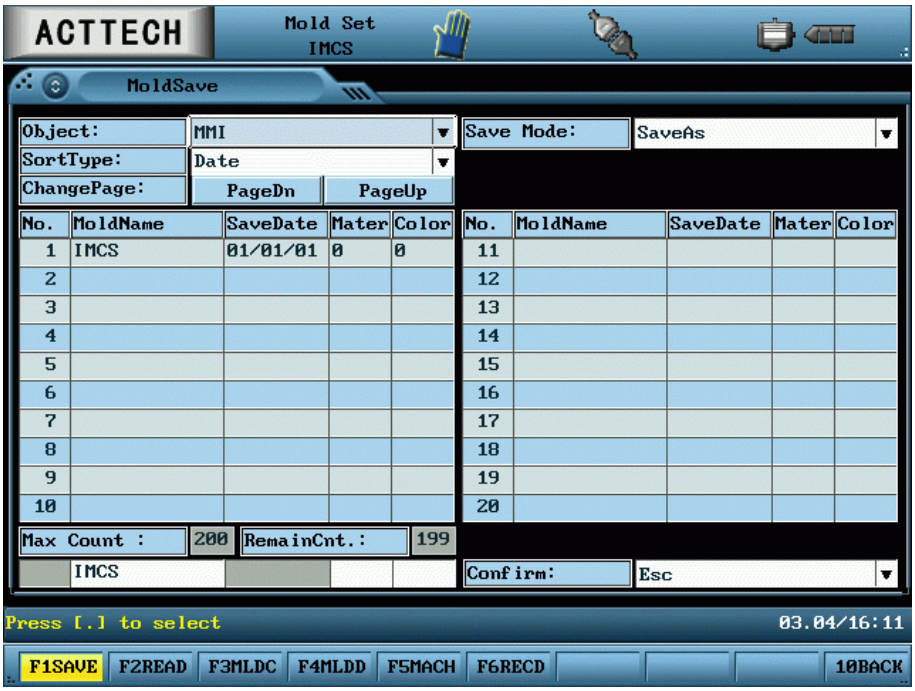
2.14.4 Machine Diag



Attention * this page data is for engineer checking system usage only, please do not perform any correction.

2.15 Mold Set Database

2.15.1 Mold Save



1:Save Current: ◎Yes ○No

"Yes": Copy current mold to another one. The left side fields will be changed to edit disable automatically, and will show you which mold as source one.

"No": Copy one mold you should select as source, and copy to another one.

2:Source: 0=MMI 1=Floppy 2=Server

Select what media type you want to be as source

3:Start No: Select No:

Start No: Change this data you can view different mold list.

Select No: Select number as source mold.

4:Object: 0=MMI 1=Floppy 2=Server

Select what media type you want to be as target.

5:Save Mold: 0=Copy 1=Replace 2=Save As

Copy :Copy source mold to target, and use the same name to save.

Replace:Copy source mold to another used one including other data.

Save As: Copy source mold to another, and you should give the "New one"(the last line) "mold name" +"material information "+" color information". Save Date is created automatically.

6:Start No: Select No:

Start No :Change this data you can view different mold list.

Select No :Select number as atarget mold.

7:Confirm: 0=Esc1=OK

Esc :No operating

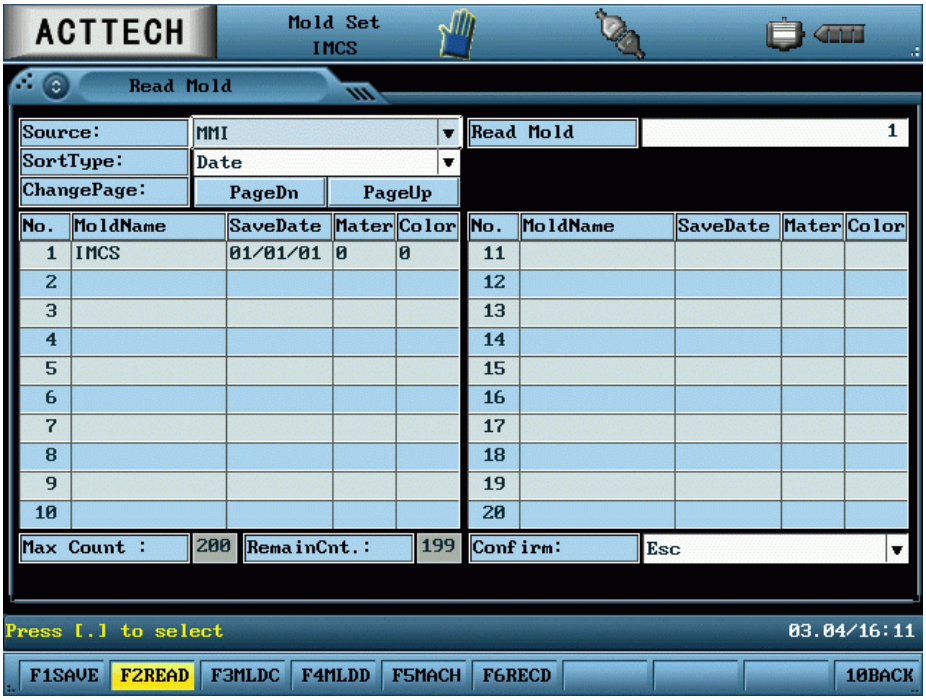
OK :Save mold as you want

8:Max Cnt: RemainCnt:

Max Cnt :Max mold number

Remain Cnt :Remain mold number

2.15.2 Mold Read



1:Save Current: ◎Yes ○No

"Yes " :Save current mold before you read another one.

"No" : Read another mold without saving current one.

2:Source: 0=MMI 1=Floppy 2=Server

Select what media type you want to read from.

3:Start No: Select No:

Start No :Change this data you can view different mold list.

Select No :Select number as reading one.

4:Object: 0=MMI 1=Floppy 2=Server

Select what media type you want to be as target.

5:Confirm: 0=Esc1=OK

Esc :No operating

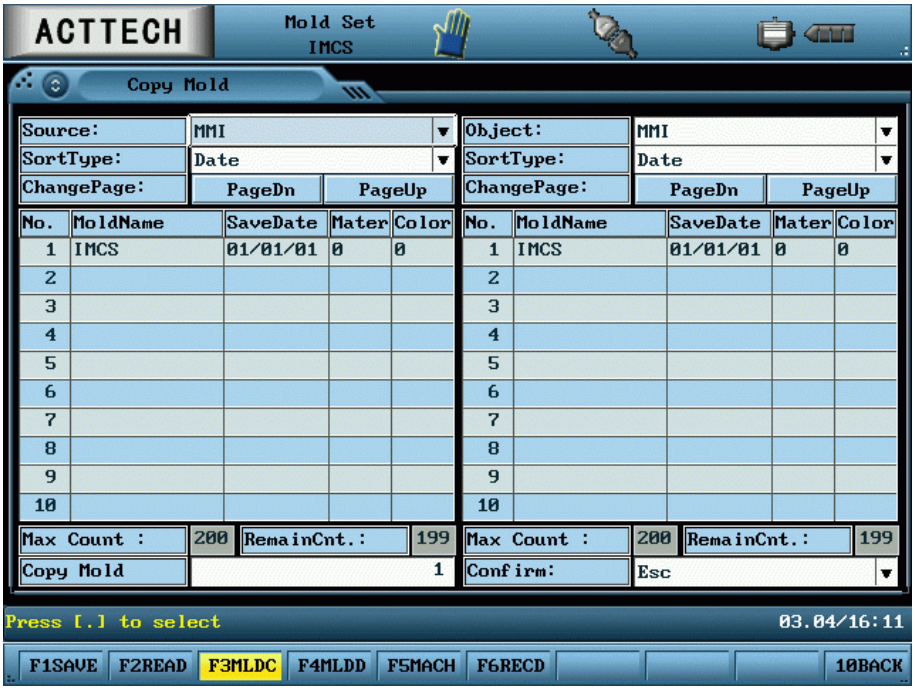
OK :Read mold as you want

6:Max Cnt: RemainCnt:

Max Cnt :Max mold number

Remain Cnt :Remain mold number

2.15.3 Mold Copy



1:Source: 0=MMI 1=Floppy 2=Server

Select what media type you want to read from.

2:Start No: Select No:

Start No :Change this data you can view different mold list.

Select No :Select number as reading one.

3:Confirm: 0=Esc1=OK

Esc :No operating

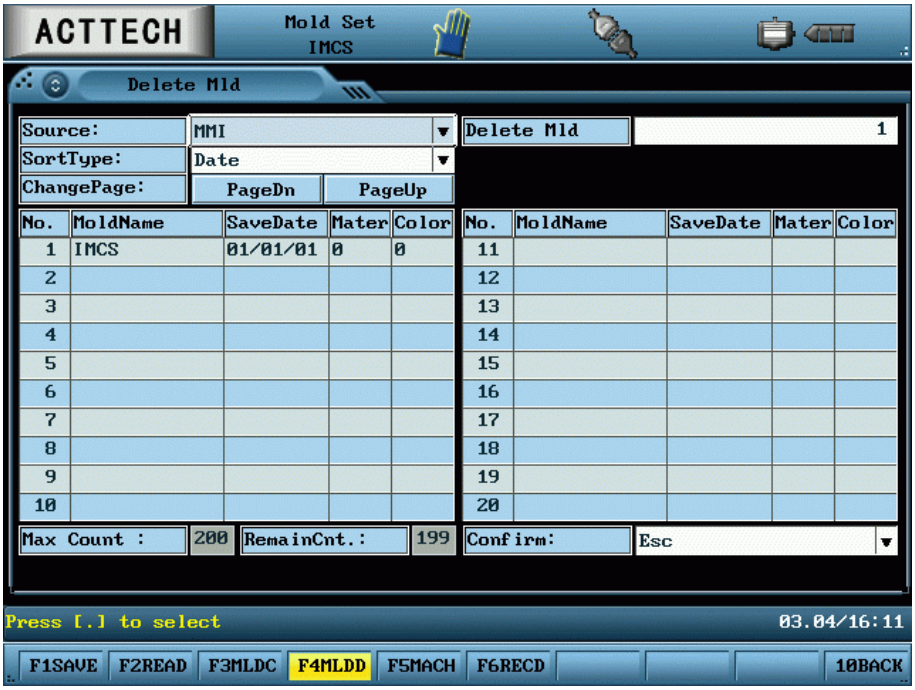
OK :Read mold as you want

4:Max Cnt: RemainCnt:

Max Cnt :Max mold number

Remain Cnt :Remain mold number

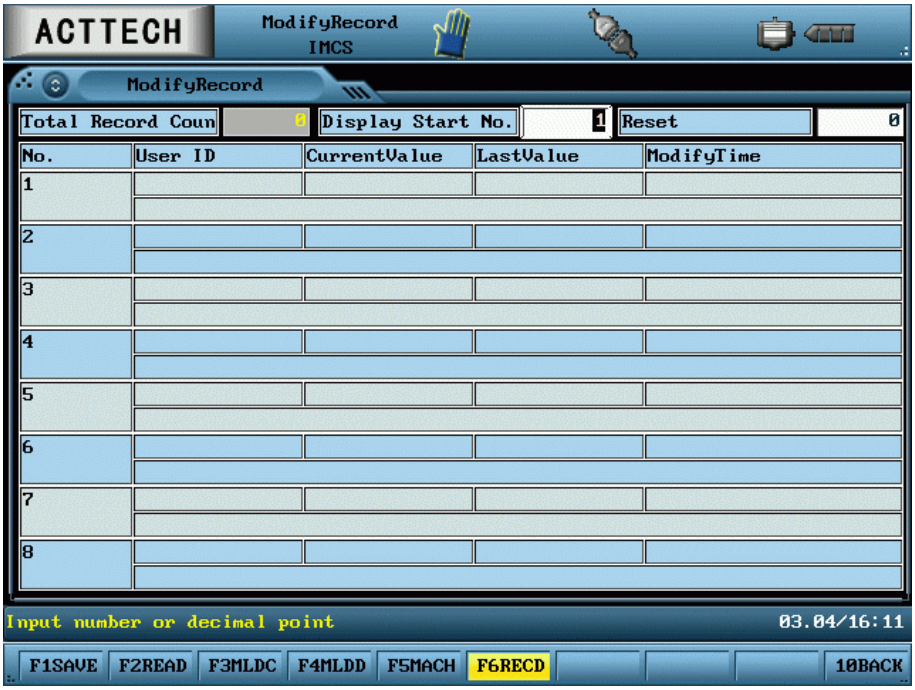
2.15.4 Mold Delete



2.15.5 Machine Set

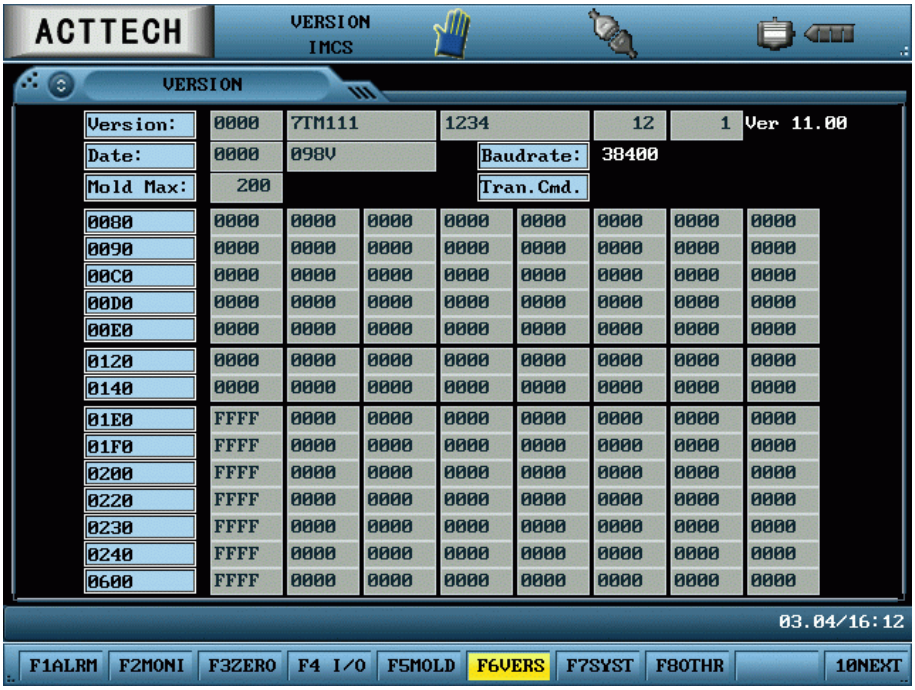
This photo allows the machine para/version info save to MMC card or outer save to other system

2.15.6 Modify Record



This is the photo para info change record

2.16 Version

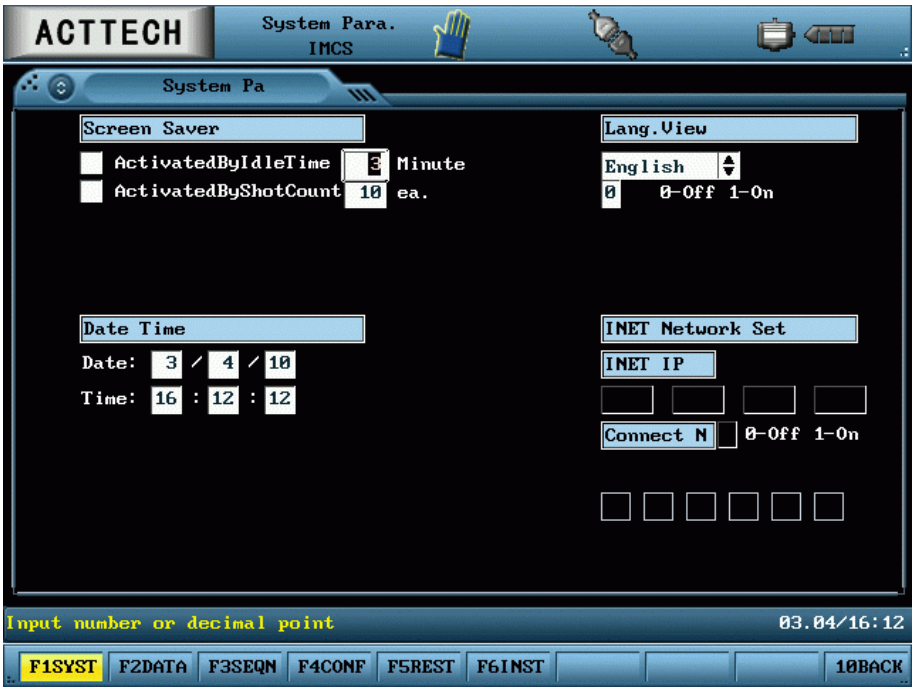


For maintenance crew to identify the machine and controller model. Please supply this information with any technical support requests you might have.

2.17 System Settings

Include F1 System, ,F2 Data,F3 SEQN,F4 CONT and F5 RESET

2.17.1 System Parameter Settings



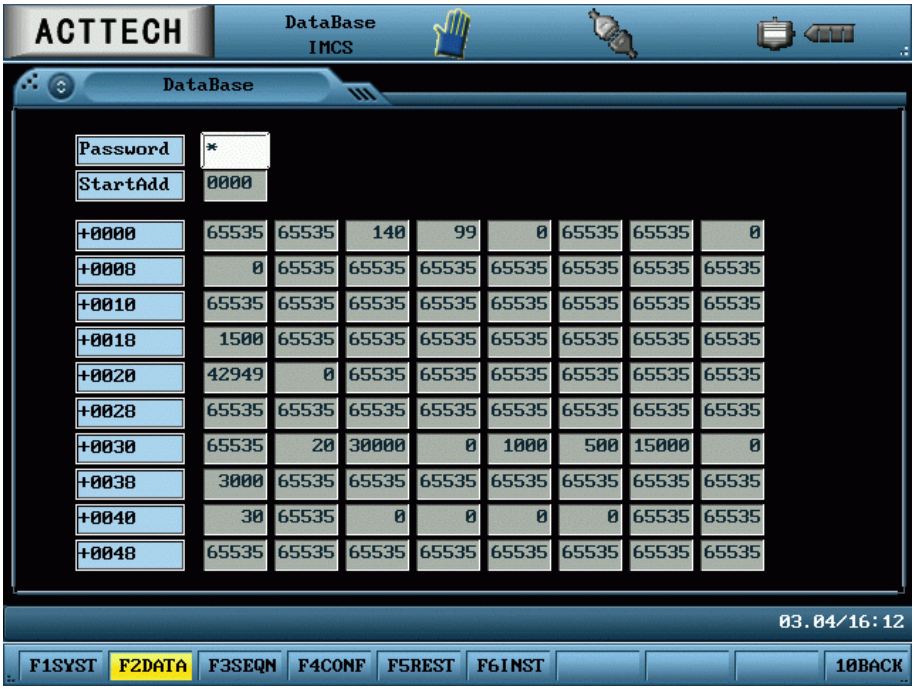
Choose/enter the desired parameter and press *OK*.

View (Language): Chinese and English are standard, other languages are optional.

Print: Choose the language you would like to use for printing.

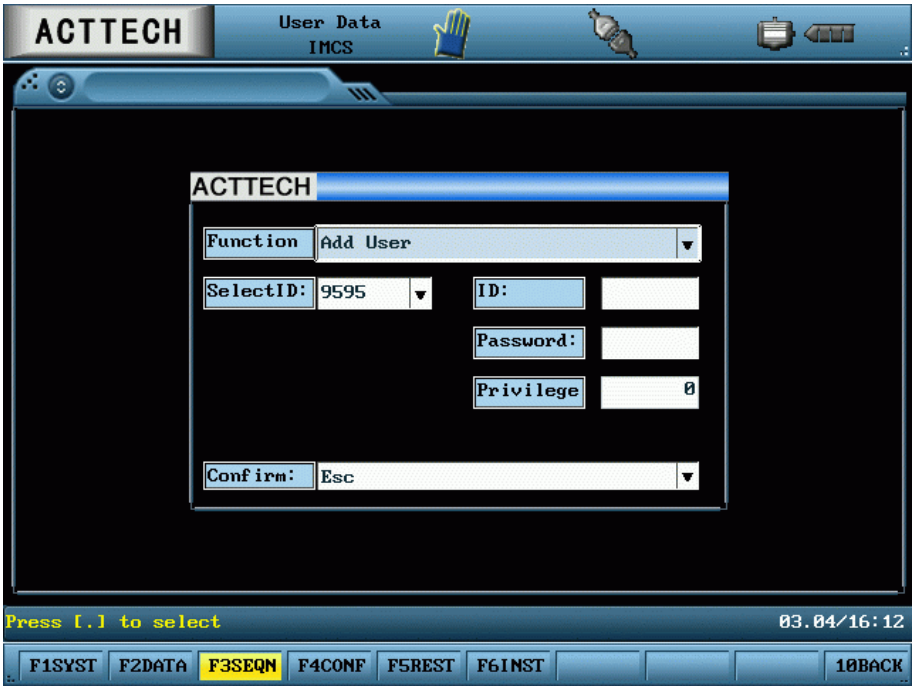
Screen Saver: Activates the screen saver according to the settings to protect the monitor screen and increase the screen's lifetime.

2.17.2 Data Base



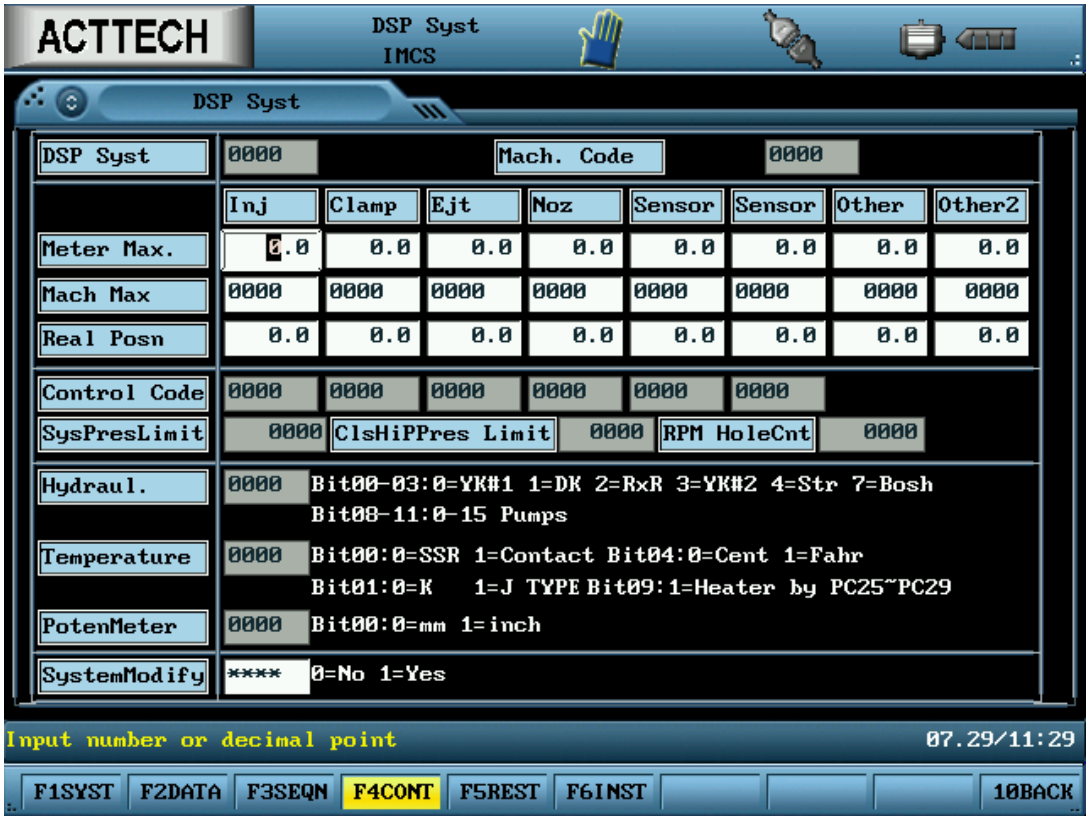
This only for the engineer, please do not change it

2.17.3 information IMCS



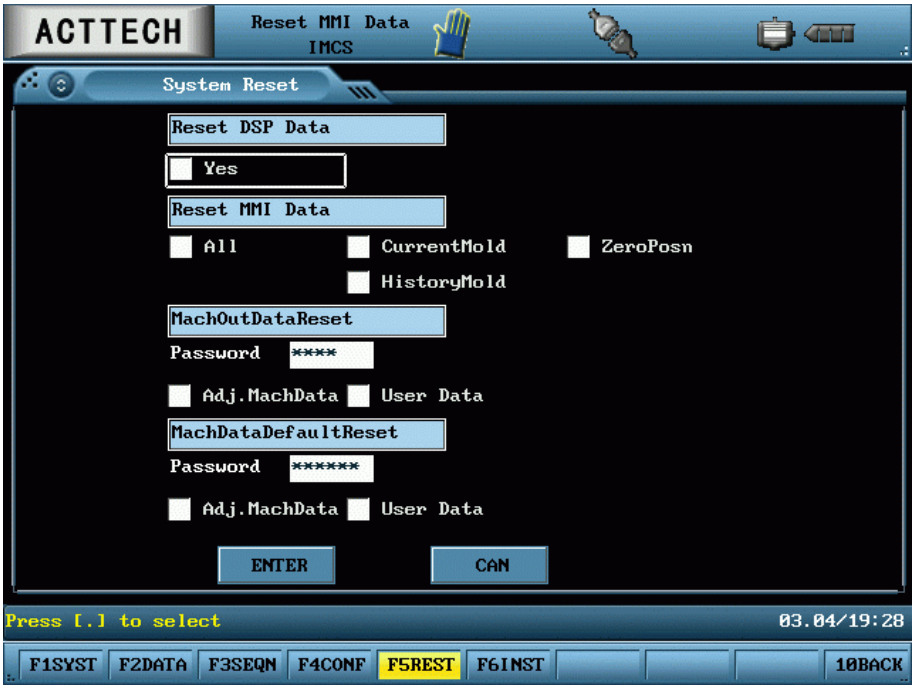
Customer could use this to change the original password

2.17.4 DSP Syst



This photo can only be using to change Meter Max and also the Mach Max and also Real Posn.

2.17.5 System Reset



This dialog box allows you to reset the system in the event of controller irregularities. Confirming the dialog will reset the system.

Warning: Only reset the system as a last resort. All user and mold set data will be lost, including saved data in the user and mold set databases! After a system reset you need to turn off the machine first before resuming machine operation.

Please note that a system reset can only be executed while in *Manual Operation* mode.

2.18 Other Special Parameter Setting

Include F1 Prod , F2 PAR1, F3 PAR2, F4 DA1, F5 DA2, F6 DA3 and F7 DA4

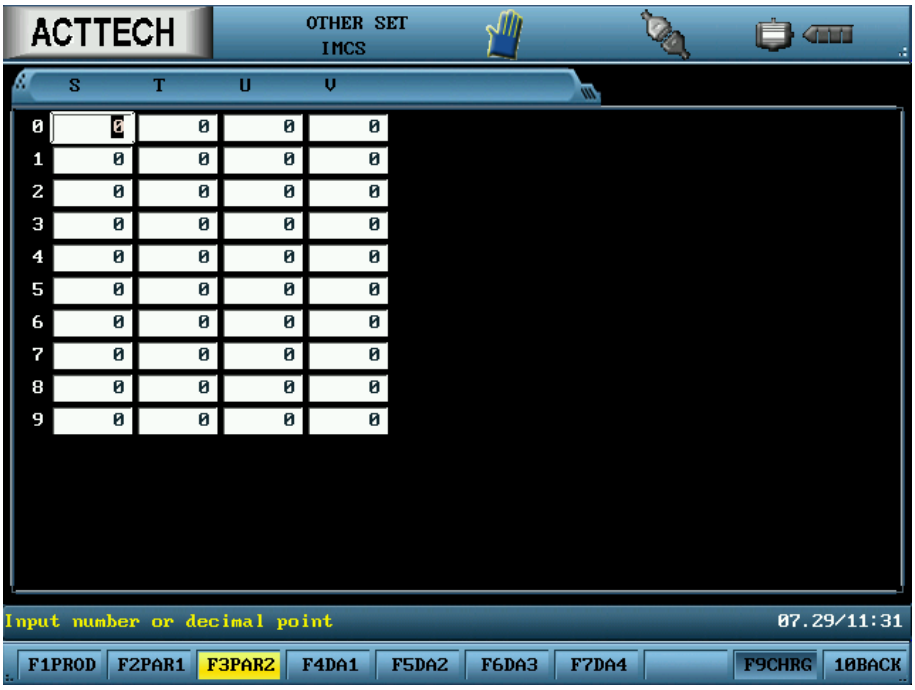
2.18.1 Other Set

Cnt. Per Mold/Clear Pack Count– can set the open mold to Zero.

Shot Cnt set– Auto calculate to the total amount of opening mold when it reach this total amount then the alarm will go on.

Pack Cnt Real. – when it reach to this number the alarm will go on but the machine won't stop.

2.18.2 Other Parameter 1/2



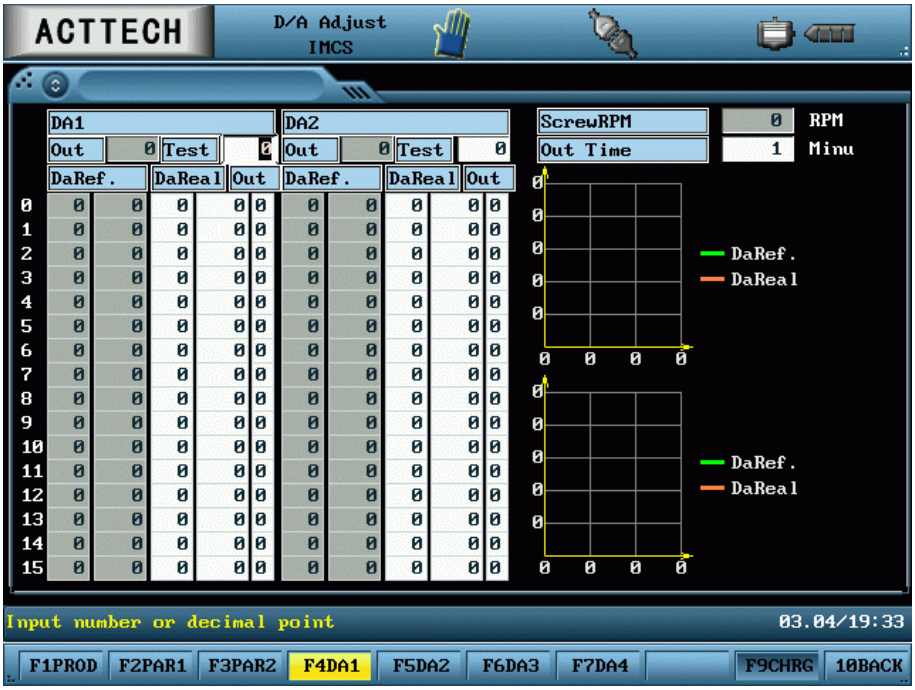
This photo include all other setting' s para(detail info please referral to prar chart)

2.18.3 DA Adjustment

You can use Step and output to adjust DA at the same time in order to adjust DA output like. DA not just provide you with straight line and also provide speed adjust, slide or working by manually
There's two ways for DA adjustment please see as the photo:

Path - **F10 Next → F8 Other → F4 DA1**

F4 DA1



DA1，DA2，DA3，and DA4 photo and functions are similar

Test：when in Correction, the input need to test the pressure or flow settings;

Output：Host feedback channel response to the corresponding value

Para1： DA curve of the system to default

Actual Value：According to actual needs of the DA After adjusting

。

For other adjustments, please call Techmation for technical service

3. I/O Channel Index

Please use this list to enter the label and description of the relevant I/O channels as supplied by the machine manufacturer. If necessary this list allows you to track any changes of I/O channel assignments.

3.1 Input Channels

Channel	Label	Description
0		
1		
2		
3		
4		
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7		
8		
9		
10		
11		
12		
13		
14		
15		
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38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		

3.2 Output Channels

Channel	Label	Description
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
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48		

3.3 Parameter Index

3.3.1 Parameter 1

No.	Close 1
0	**Cls Start Ramp Time** – Initial pressure/speed buildup time limit
1	**Close Pres Ramp** – Pressure change time limit for transition between different mold closing phases
2	**Close Flow Ramp** – Speed change time limit for transition between different mold closing phases
3	**Close Setup Pres** – Pressure settings for mold height adjustment
4	**Close Setup Flow** – Speed settings for mold height adjustment
5	**Auto Adj Protect Time** – Low pressure phase duration for auto mold adjustment
6	**Cls Low Pres Hyd. Dly** – Delay time before changing to low hydraulic pressure settings after transition position has been reached
7	**Cls Low Pres Valve Dly** – Delay time for closing valve after 1st transition position (high /low speed) has been reached
8	**Cls Hi Pres Valve Dly** – Delay time for closing valve after 2nd transition position (low speed/high pressure) has been reached
9	**Cls Hi Pres Hyd. Dly** – Delay time before changing to high hydraulic pressure settings after transition position has been reached

No.	Close 2
0	**Cls Hi Pres Hold Time** – High pressure hold time at the end of high pressure phase
1	**Cls End Dly** – Delay time for resetting hydraulic speed/pressure at the end of mold closing
2	**Mold Open Effect Area** – Position range relative to mold opening end position to allow for activation of ejector/core(s)
3	
4	
5	
6	
7	
8	
9	

No.	Open 1
0	**Mold Open Pres Ramp** – Pressure change time limit for transition between start/slow and high speed phase
1	**Mold Open Flow Ramp** – Speed change time limit for transition between start/slow and high speed phase
2	**Mold Open Pres Ramp 2** – Pressure change time limit for transition between high and final slow speed phase
3	**Mold Open Flow Ramp 2** – Speed change time limit for transition between high and final slow speed phase
4	**Open Setup Pres** – Pressure settings for mold height adjustment
5	**Open Setup Flow** – Speed settings for mold height adjustment
6	**Open Drain Time** – Pressure release time before mold opening
7	**Opn Slow1 PC32 On Dly** – PC32 valve activation delay time
8	**Delay Open #2** - Delay time for resetting hydraulic speed/pressure at the end of mold opening
9	**Open End Valve Dly** – Delay time for closing valve after completion of mold opening

No.	Injection
0	**Inject Pres Ramp** – Pressure change time limit for transition between injection phases
1	**Inject Flow Ramp** – Speed change time limit for transition between injection phases
2	**Inject Setup Pres** – Pressure settings for mold height adjustment
3	**Inject Setup Flow** – Speed settings for mold height adjustment
4	**Inject Dly** – Injection delay time after nozzle has touched the mold
5	**Inject End Valve Dly Off** – Delay time for closing valve after completion of injection
6	
7	
8	
9	

No.	Charge/Suck-Back
0	**Charge Pres Ramp** – Pressure change time limit for transition between different charge (plasticizing) phases
1	**Charge Flow Ramp** – Speed change time limit for transition between different charge (plasticizing) phases
2	**Charge Setup Pres** – Pressure settings for mold height adjustment
3	**Charge Setup Flow** – Speed settings for mold height adjustment
4	**Charge Valve Dly** – Charge (plasticizing) valve opening delay time
5	**Chg End Valve Dly Off** – Delay time for closing valve after completion of charging (plasticizing)
6	**Suck End Valve Dly Off** – Delay time for closing suck-back valve after completion of suck-back
7	
8	
9	

No.	Nozzle
0	**Nozzle Setup Pres** – Pressure settings for mold height adjustment
1	**Nozzle Setup Flow** – Speed settings for mold height adjustment
2	**Nozzle Fwd Slow Time** – Duration of slow nozzle movement before mold contact
3	**Door Open Time** –Timer for pneumatic safety door open
4	
5	
6	
7	
8	
9	

No.	D/A
0	**Set 1, If D/A be Changed –** Set to “1” to use adjusted D/A pressure converter table
1	**0 kg (0%) D/A Value –** Enter desired pressure in % for pressure level 1
2	**10 kg (7%) D/A Value –** Enter desired pressure in % for pressure level 2
3	**20 kg (14%) D/A Value –** Enter desired pressure in % for pressure level 3
4	**30 kg (21%) D/A Value –** Enter desired pressure in % for pressure level 4
5	**55 kg (39%) D/A Value –** Enter desired pressure in % for pressure level 5
6	**85 kg (61%) D/A Value –** Enter desired pressure in % for pressure level 6
7	**120 kg (86%) D/A Value –** Enter desired pressure in % for pressure level 7
8	**140 kg (100%) D/A Value –** Enter desired pressure in % for pressure level 8
9	

3.3.2 Parameter 2

No.	Ejection
0	**Eject Pres Ramp** – Pressure change time limit for transition between different phases
1	**Eject Flow Ramp** – Speed change time limit for transition between different phases
2	**Eject Setup Pres** – Pressure settings for mold height adjustment
3	**Eject Setup Flow** – Speed settings for mold height adjustment
4	**Eject Ret. Effect Area** – Position range allowed for partial ejector retraction between activation (in case of multiple ejector activation, relative to absolute retraction end position)
5	**Eject Ret. Max Posn** – Absolute retraction end position in relation to transducer zero point (for final retraction)
6	**Vibrate Eject Time** – Ejector vibration time
7	
8	
9	

No.	Temperature 1
0	**Temp 1 Ramp** – Temperature buildup degree limit for barrel heating zone 1
1	**Temp 2 Ramp** – Temperature buildup degree limit for barrel heating zone 2
2	**Temp 3 Ramp** – Temperature buildup degree limit for barrel heating zone 3
3	**Temp 4 Ramp** – Temperature buildup degree limit for barrel heating zone 4
4	**Temp 5 Ramp** – Temperature buildup degree limit for barrel heating zone 5
5	**Temp 6 Ramp** – Temperature buildup degree limit for barrel heating zone 6
6	**Temp 7 Ramp** – Temperature buildup degree limit for barrel heating zone 7
7	**Temp 8 Ramp** – Temperature buildup degree limit for barrel heating zone 8
8	**Temp 9 Ramp** – Temperature buildup degree limit for barrel heating zone 9
9	

No.	Temperature 2
0	**Oil Temp Up Limit** – Hydraulic oil temperature upper limit
1	**Oil Temp Low Limit** – Hydraulic oil temperature lower limit
2	**Temp Cooler On** – Barrel cooler activation temperature
3	**Temp Cooler Off** – Barrel cooler deactivation temperature
4	**Temperature Not Up** – Setting for temperature warning (°C increase per 3 minutes)
5	**Cooler On Deviate** – Hydraulic oil cooler activation temperature
6	**Cooler Off Deviate** – Hydraulic oil cooler deactivation temperature
7	
8	
9	

No.	Alarm
0	**Auto Alarm Unit Cnt** – Auto alarm activation cycle count
1	**Cls Protect Max Time** – Maximum allowed mold closing time for low pressure phase before the auto alarm is activated
2	**Cls Hi Pres Max Time** – Maximum allowed mold closing time for high pressure phase before the auto alarm is activated
3	**Charge Max Time** – Maximum allowed charging (plasticizing) time before the auto alarm is activated
4	**Suck-Back Max Time** – Maximum allowed suck-back time before the auto alarm is activated
5	**Cycle Max Time** – Maximum allowed cycle time before the auto alarm is activated
6	**Temp Up Limit** – Upper range limit for barrel temperature
7	**Temp Low Limit** – Lower range limit for barrel temperature
8	**Heater Off Alarm** – Heater cut off time after alarm initiated machine stop
9	**Buzzer Count** – Number of alarm buzzer sounds (the hydraulic motor will be turned off after the last buzzer)

No.	Other 1
0	**Motor On Hold Time** – Hydraulic motor hold time before machine operation starts to allow for start up of additional motors
1	**Motor Y Start** – Duration of high torque motor start up (Y coils being used)
2	**Motor Delta Time** – Transition time for switching from high torque start up (Y coils) to normal operation mode (Δ coils)
3	**Core Protect** – Set to “1” to activate core protection function
4	**Adjust Slow Speed** – Speed setting for slow speed phase during mold height adjustment
5	**Adjust Count** – Automatic mold height adjustment setting, do not change!
6	**Mold Open Cooling** – Set to “1” to allow for mold cooling before complete mold opening
7	**Adjust System Press1**
8	**Adjust System Flow 1**
9	**Adjust System Press 2**

No.	Other 2
0	**Power Match 1** – Speed settings limit for activation of hydraulic pump 1
1	**Power Match 2** – Speed settings limit for activation of hydraulic pump 2
2	**Power Match 3** – Speed settings limit for activation of hydraulic pump 3
3	**Power Match 4** – Speed settings limit for activation of hydraulic pump 4
4	**Power Door Pres** – High speed pressure settings for opening/closing of power door
5	**Power Door Spd** – High speed speed settings for opening/closing of power door
6	**Power Door Pres** 2 – Low speed pressure settings for opening/closing of power door
7	**Power Door Spd** 2 – Low speed speed settings for opening/closing of power door
8	**Special Core Func**
9	**Special Core Time**

No.	Lubrication
0	**Lubricator Count** – Number of cycles between each lubrication
1	**Lubricator Time** – Lubricator activation time
2	**Lubricator Delay** – Special feature
3	**Lubricator Total Time** – Special feature
4	
5	
6	
7	
8	
9	

4. Alarm/Error Message Index

In case of an error the corresponding alarm message will be displayed in the status bar in the lower left part of your screen just above the *F1 – F10* keys (please refer to the *Overview* section for exact location of the status bar). You can see the alarm messages regardless of the screen you are currently using. In case of multiple alarms the status bar will display the most important alarm.

For a more detailed description and analysis of the error(s) that caused the alarm you can switch to the *Error Messages Display Screen* by pressing the *(F6) Alarm* key. In case of multiple alarms this screen allows you to verify any error/alarm messages the status bar might not have displayed.

Please refer to the *Error Messages Display Screen* section for more information.

Alarm/Error Message Explanation:

1 - **"Temperature Error"** – Indicates a barrel heating temperature problem/possible malfunction. Check the settings and current temperature. Please refer to the *Temperature Control* section of this manual for additional information.

2 - **"Please Close Door"** – Prompt in *Semi-auto* mode to close the door to start the next production cycle. Please refer to the *Machine Control Panel Keys* section of this manual for additional information.

3 - **"Please Open Door"** – Prompt in *Semi-auto* mode to open the door at the end of the production cycle. Please refer to the *Machine Control Panel Keys* section of this manual for additional information.

4 - **"Off Man./Emerg. Key"** – Indicates the machine has been stopped as a result of pressing either the *Manual* key or the *Emergency* button. Release the *Emergency* key if necessary to resume machine operation.

5 - **"Oil Temp. Over"** – Indicates the hydraulic oil temperature is too low or too high. Check the parameter settings and adjust if necessary. In case of overheating make sure the cooling system is turned on. In case of low temperature make sure the hydraulic motor is turned on and wait until the motor has warmed up the hydraulic oil sufficiently.

6 - **"Cycle Time Exceeded"** – Indicates the production cycle time during the last cycle has been outside the preset limits. Check *Monitor 1* for more details. Please refer to the *Monitoring Settings 1 (Automatic Alarm)* section of this manual for more information.

7 - Reserved (not used)

8 - **"Eject Position Error"** – Indicates an ejector position problem. Check the ejector position as well as the relevant potentiometer.

9 - **"Inject Cushion Error"** – Indicates the injection parameters during the last production cycle have been outside the preset limits. Check *Monitor 1* for more details. Please refer to the *Monitoring Settings 1 (Automatic Alarm)* section of this manual for more information.

10 - **"Purge Guard Opened"** – Indicates that the injection unit cover is open. Please close the cover to resume machine operation.

11 - **"Robot Malfunction"** – Indicates a robot problem. Check and reset robot to resume machine operation.

12 - **"No. of Shots Reached"** – Indicates the preset number of production cycles has been reached. Please refer to the *Production Control* section of this manual for more information.

13 - **"Mold Open Time Out" -** Indicates the mold opening parameters during the last production cycle have been outside the preset limits. Check *Monitor 1* for more details. Please refer to the *Monitoring Settings 1 (Automatic Alarm)* section of this manual for more information.

14 - **"Part Not Dropped"** – Indicates an ejection failure while in *Photo Sensor* mode. Remove the mold product before resuming machine operation. Please refer to the *Machine Control Panel Keys* section of this manual for additional information.

15 - **"Hopper Empty"** – Refill the hopper with plastic granulate.

16 - **"Mold Close End Error"** – Indicates the mold closing parameters during the last production cycle have been outside the preset limits. Check *Monitor 1* for more details. Please refer to the *Monitoring Settings 1 (Automatic Alarm)* section of this manual for more information.

17 - "Pos. Setting Error" – Indicates inconsistent position settings for either *Mold Closing*, *Mold Opening*, *Suck-back* or *Charge (Plasticizing)* settings. Check the relevant settings.

18 - "Finish Auto Adjust" – Indicates the automatic *Mold Height Adjustment* has been completed. Please refer to the *Machine Operating Mode Keys* section of this manual for additional information.

19 - "Lubr. Oil Level Error" – Indicates the lubrication oil level is too low. Check the oil level and fill up if necessary.

20 - "Inj. Start Pos. Error" – Indicates the injection parameters during the last production cycle have been outside the preset limits. Check *Monitor 1* for more details. Please refer to the *Monitoring Settings 1 (Automatic Alarm)* section of this manual for more information.

21 - "Screw Rpm Error" – Indicates a problem during screw operation. Check the *Charge (Plasticizing)* settings and make sure the hopper is no empty.

22 - "Inject Time Error" – Indicates the injection parameters during the last production cycle have been outside the preset limits. Check *Monitor 1* for more details. Please refer to the *Monitoring Settings 1 (Automatic Alarm)* section of this manual for more information.

23 - "Opn 1-Slow Pos. Error" – Indicates a problem during automatic *Mold Height Adjustment*. Check the transition position from slow to fast movement during *Mold Opening*. Adjust if necessary.

24 - "Mold Protection Error" – Indicates that the mold could not close properly. Check if the molding product has been completely ejected. Adjust mold settings if necessary.

25 - "Decompress End Error" – Indicates *Suck-back* could not be executed according to the settings. Check and adjust settings if necessary.

26 - "Charge End Error" – Indicates that the screw could not reach the set end position during *Charge (Plasticizing)*. Make sure the hopper is not empty and adjust settings if necessary.

27 - "Pack Count Reached" – Indicates the preset number of product packs has been reached. Please refer to the *Production Control* section of this manual for more information.

28 - "Core Pull End Error" – Indicates the core has not reached the preset end position (limit switch). Check the core position and make sure it is moving freely.

29 - Reserved (not used)

30 - "Lubrication Fail" – Indicates a lubrication problem. Check the lubrication system.

31 - "Oil Level too Low" – Indicates the hydraulic oil level is too low. Check the hydraulic oil level and fill up if necessary.

32 - "Oil Filter Blocked" – Indicates a blocked hydraulic oil filter. Check the filter and clean if necessary.

33 - "Ptm. Board Check Error" – Indicates a communication problem with the potentiometer board. Check board for possible causes.

34 - "Adjust End Touched" – Warning message indicating the moving platen has reached the backward end position (limit switch). Do not move platen/mold further backward to avoid damage to the machine.

35 - Reserved (not used)

36 - "C. P. Active Pos. Error" – Indicates a core position settings problem. Verify the core settings and mold position at time of core activation and change if necessary.

37 - "C. P. Set Error" – Indicates a problem with the core in/out activation positions. Verify settings and change if necessary.

38 - **"Waiting Air Mold"** – Indicates the controller is waiting for signal form air injection system.

39 - "Adj. Sensor Fail." – Indicates automatic *Mold Height Adjustment* failure. Check the pressure and speed settings and verify if the platen/mold is moving.

40 - "Cool Water Prs Low" – Indicates low cooling water pressure. Check cooling system.

41 - "Switching Mold" – Status message during mold switching.

42 - **"Waiting Robot"** – Status message during robot operation.

43 - "Pls Press Close Key" – Prompt in *Auto* mode to press Close Mold key to start machine operation.

44 - "Eject Not Back" – Indicates the ejector has not reached the end position (limit switch). Check the ejector.

45 - Reserved (not used)

46 - "Lub. Filter Fail" – Indicates a problem with the lubrication oil filter. Check filter for possible causes.

47 - Reserved (not used)

48 - "Motor Fail" – Indicates a hydraulic pump motor failure. Check motor for possible causes.

49 - "Pls Press Start Key" – Prompt in *Semi-auto* mode to press *Start* key to start machine operation.

50 - "Pls Close Rear Door" – Indicates an open rear door. Close door to resume machine operation.

51 - Reserved (not used)

52 - "Manual Open/Eject" – Prompt in *Manual* mode to execute *Mold Opening* and *Ejection* manually to prevent possible damage to machine.

53 - "Motor Overload" – Indicates problem with hydraulic pump motor. Check the motor for possible causes.

54 - Reserved (not used)

55 - Reserved (not used)

56 - "Manual Open" – Prompt in *Manual* mode to execute *Mold Opening* manually to prevent possible damage to machine.

57 - "Temperature not up" – Indicates a barrel heating temperature error. The pre-set temperature could not be reached. Check the barrel heater.

58 - "Safe B. Plate Fail" – Indicates possible object on bottom plate. Remove any objects to resume machine operation.

59 - Reserved (not used)

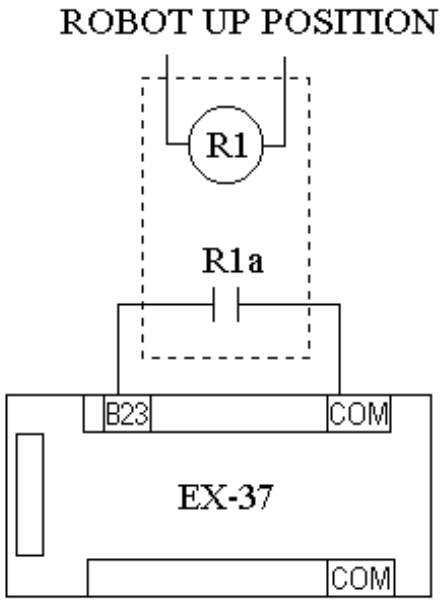
60 - Reserved (not used)

61 - **"Pls Close Upper Cover" -** Indicates an open top cover. Close the cover to resume machine operation.

5. Robot Installation (Optional)

If you want to install a robot on the machine, the C-6000 controller provides a protection circuit for robot control and mold protection. Please refer to below diagram for robot circuit wiring.

- Connect the robot to the appropriate input point (default is PB23).
- Connect the robot to the appropriate output point (default is PC28).
- Activate the robot mode in the *Other Settings* screen (refer to the *Other Functions and Settings* section).



ROBOT PC OUTPUT