Fans & Air Handling Equipment | Lenze VFDs

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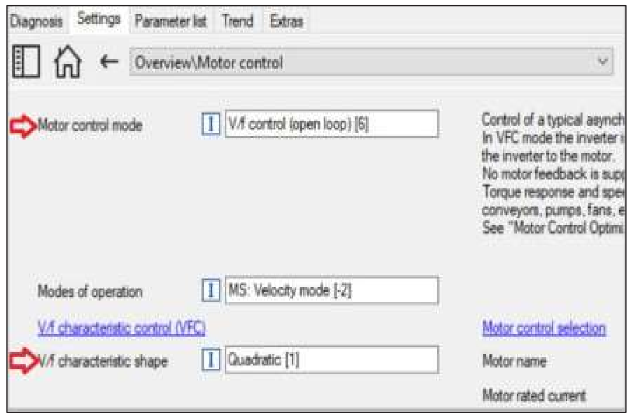
1 Introduction

This guide is intended for engineers and installers applying the i550 in ventilation applications. Unlike the generic i550 manuals this guide purely focuses on ventilation specific functionalities. For additional features like mapping of various fieldbuses please refer to the Lenze Product pages or the Help Texts of the Lenze VFD PC-Tool Easy Starter.

2 General Settings for Fans

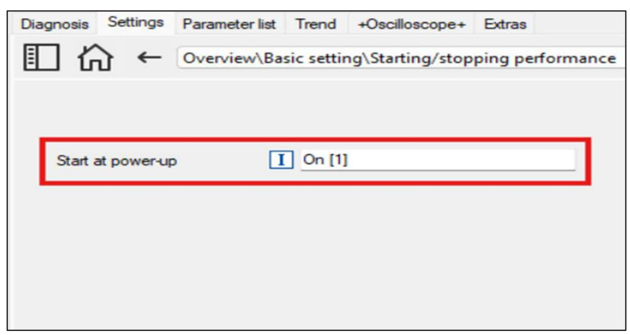
Motor Control Mode:

For simple and energy efficient motor control Lenze recommends following motor control settings:
AC Induction motors, set the "Motor control mode" (P300.000) = "V/f control (open loop) [6]" and set "V/f characteristic shape" (P302.000) = "Quadratic [1]". For fans with PMAC motors, "Motor control mode (P300:000)" should be set to "Sensorl. Contr. (SLSM-PSM) [8]."



Start on Power Up

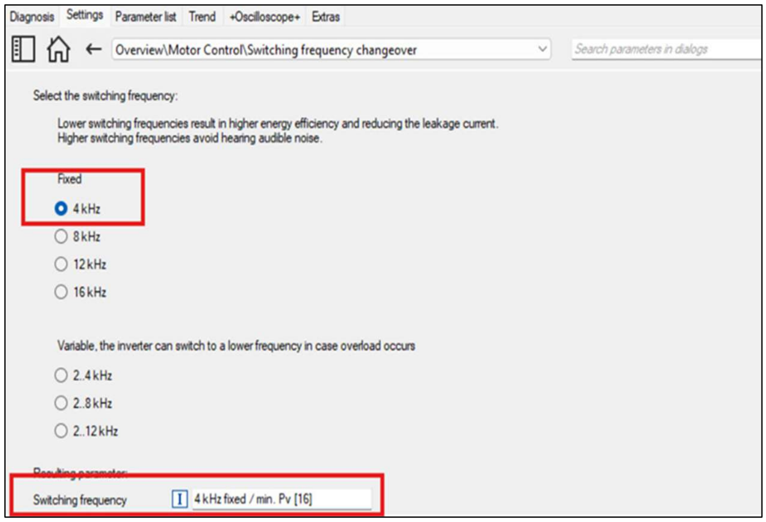
A common requirement for drives in fan applications is to start on the application of power if the RUN command is already asserted. Normally, the drive must power-up first and then receive a RUN command to avoid a FAULT. The drive may be programmed to allow start on power-up simply by setting "Start at Power-up" (0x2838:002 – P203:002) = [1] On



Light Duty Mode

The light duty mode is in general available on i5x0 cabinet ≥ 3 kW, IP21/31 (NEMA 1) inverters but not for IP66 & IP55 inverters. The standard default setting is heavy duty but can be parameterized also for light duty, allowing a continuous higher current rating with the same inverter. This helps the customer to select a smaller inverter.

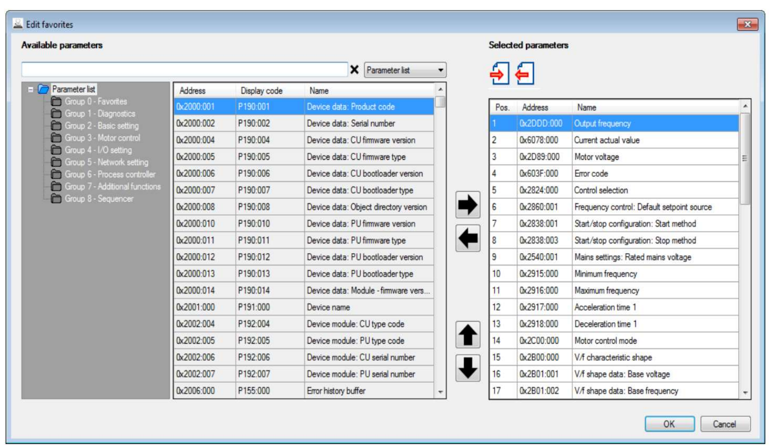
To use light duty mode the drive must use 4kHz carrier frequency (0x2939:000- P305:000 Switching frequency).



Once done activate light duty mode: Set “Inverter load characteristic: Duty selection” (0x2D43:001 – P306:001) = Light Duty [1].

End-User Experience Optimization (Favorite menu)

Select within Easy-Starter the top 5-10 parameters in preferred order in the favorite menu.

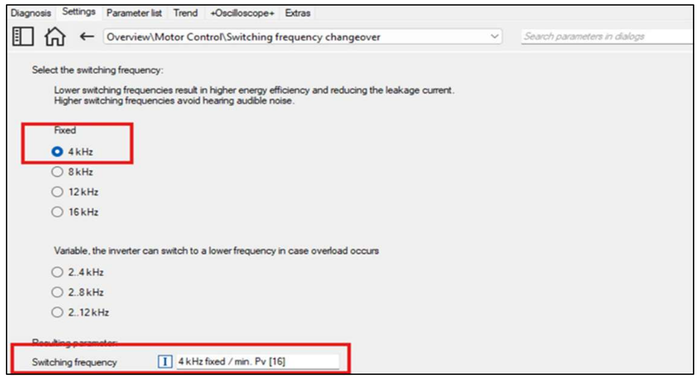


Leakage current optimization

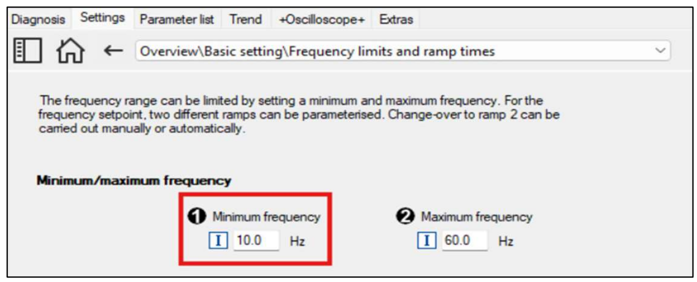
The i500 inverters do in general have low leakage currents. In principle the i5x0 inverters can be used up to 11 kW on a 30mA RCD device, details can be found in the respective product documentation. Usage of short motor cables and removing the IT-screws (available on i5x0 cabinet inverters) can further decrease the leakage current.

Also following settings can help to minimize the leakage current:

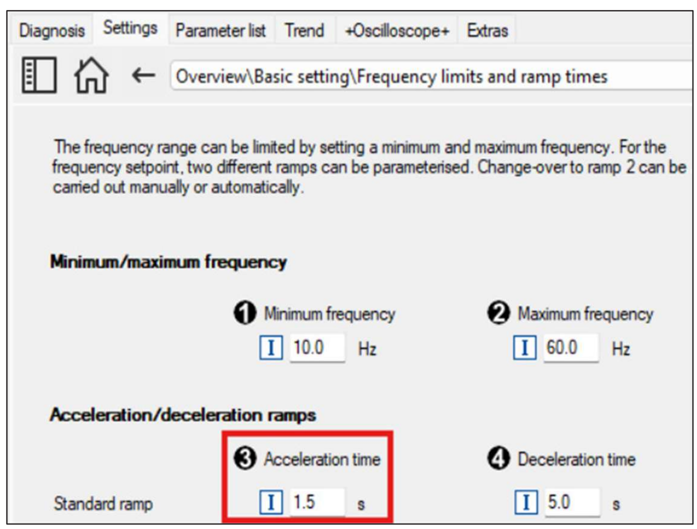
1. Set “Switching frequency” (0x2939:000- P305:000) for the lowest possible set frequency.



2. Set the minimum frequency to 15 to 20 Hz. This means the motor runs at no less than that speed on start-up. “Minimum frequency” (0x2915:000 – P210:000)



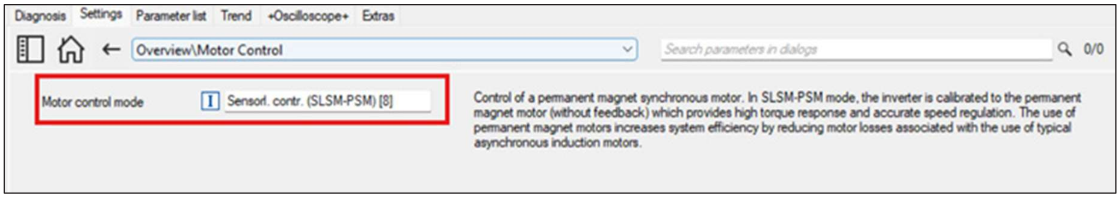
3. Set the fastest acceleration time possible. This action reduces the chance of tripping during speed increase. “Acceleration time 1”(0x2917:000 – P220:000).



4. Use the shortest possible motor power cables. Long leads add capacitance to the system and increase the leakage level.
5. Make sure there is a good ground connection. The motor power cables should have a shield and be terminated on the drive end.
6. Check the motor manufacturer for grounding requirements on their side.

3 PM Motor Control Support

Lenze offers a very powerful and flexible PM motor control scheme “SLSM-PSM”. Parameter 0x2C00:000-P300:000 [Motor control mode] with selection [8] SLSM-PSM. This selection works best at carrier frequencies of 8kHz.



Most important is to select the right Low speed method: 0x2C13:000 with the two options:

[2] = i/f based

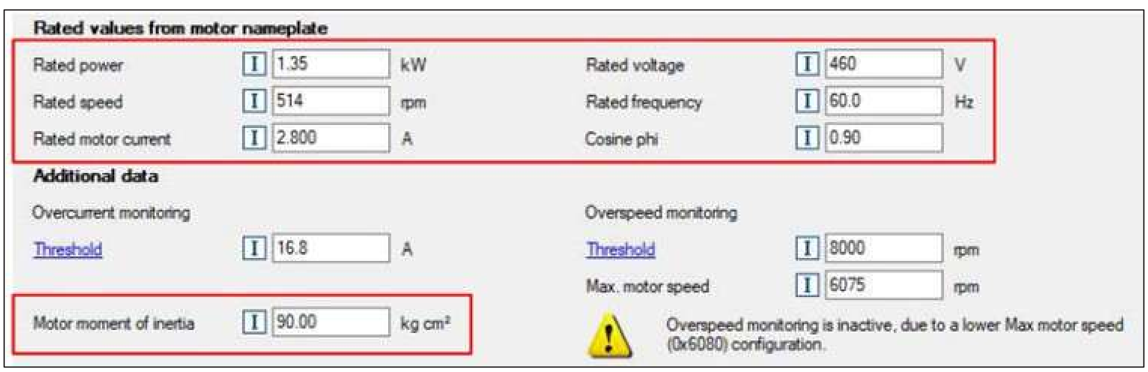
i/f based is the recommended universal method for any motor in particular for pump & fan applications and typically applied in the market as it is easy to commission with OK performance.

[1] -Carrier Based [DEFAULT Setting]

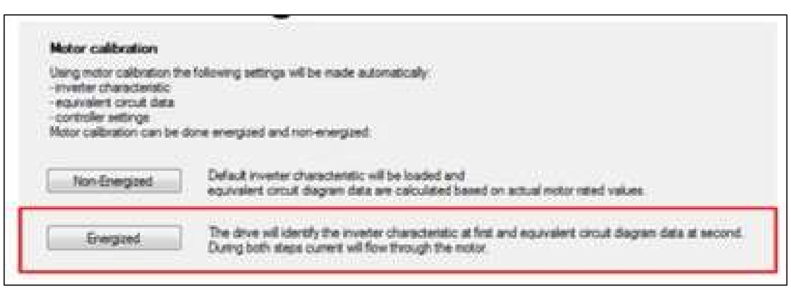
This is the Lenze unique method to support dynamic and precise motor control even in low speed with a possible stating torque of up to 200%. It is particularly easy to use and powerful with the Lenze IE5 motors. It is recommended for dynamic applications, however, it might not be suitable for every motor.

Basic Commissioning Steps

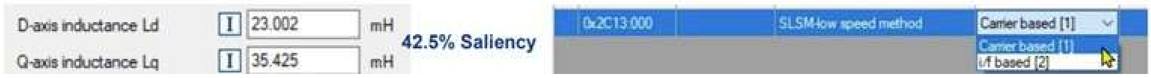
1. Enter motor nameplate data



2. Perform Energized Calibration

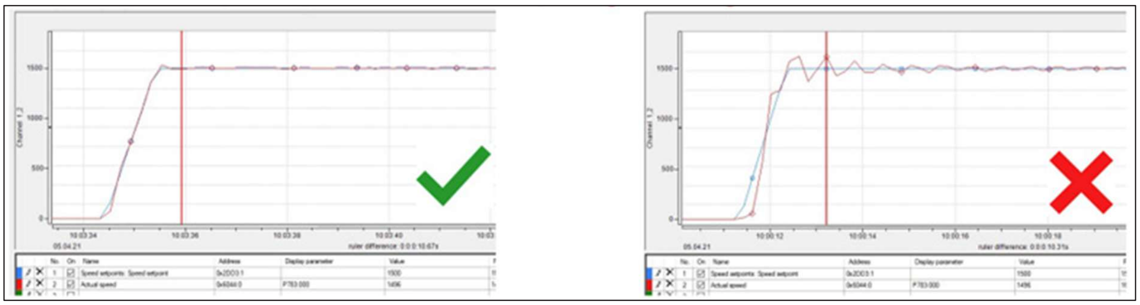


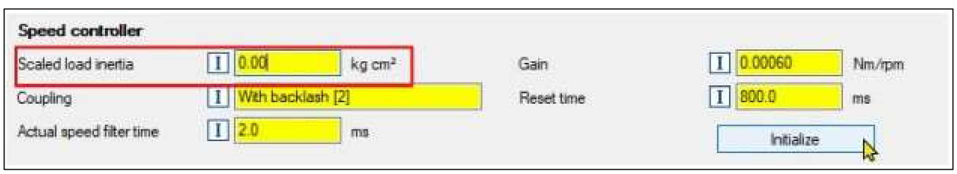
3. Check the Ld and Lq inductance values and determine the saliency. If saliency is less than 5...10% then set “SLSM-low speed method” (0x2C13:000) to i/f based [2]; otherwise, leave Carrier Based [1] selected



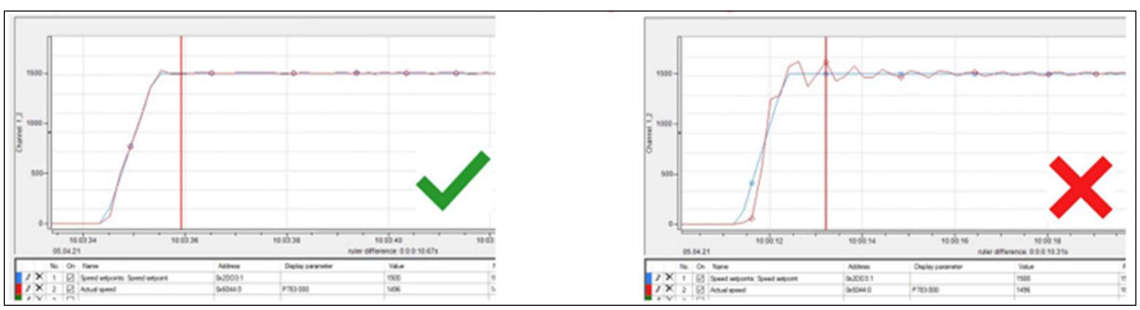
4. Configure a trend or trace plotting “Speed setpoint” (0x2DD#:001) versus “Actual speed” (0x6044:000-P783:000). Attempt to run the motor up to rated / application speed.

   If the motor does not start or is not able to get to set speed, you may need to tune the low-speed range, please refer to “**low speed [non-observable] range tuning advice**” at the end of this procedure.



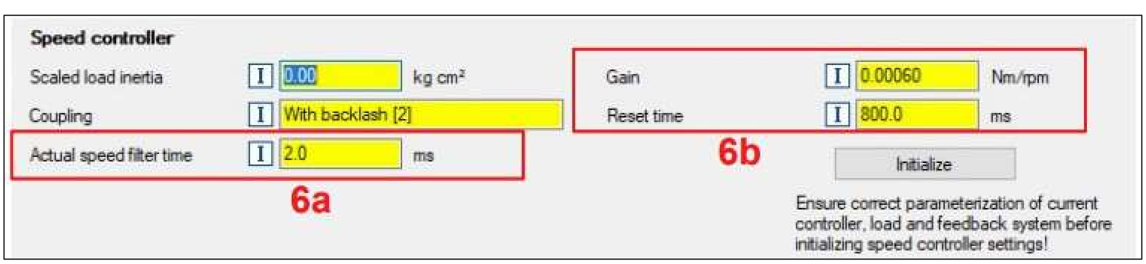


If actual speed is still not tracking setpoint satisfactorily for the application, check the trend again. Begin manual speed loop tuning as described in step 6.

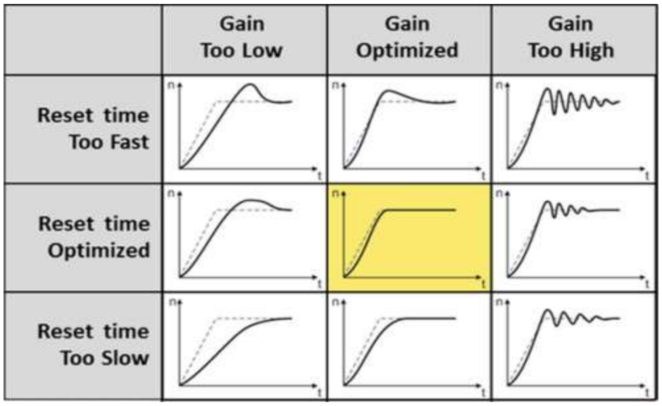


6. Manually tune Speed Controller settings:

a) Increase actual speed filter time [to 4.0...5.0 ms], check the trend to see if actual velocity is tracking setpoint satisfactorily. If the tracking is still not satisfactory, then continue to step 6b.



b) Adjust Speed controller Gain and Reset time using the advice in the graphic below. Generally, adjustments to Gain and Reset time are done in +/- 10...30% increments. After each adjustment, check the trend to see the effects and determine if the actual velocity is tracking setpoint satisfactorily. Once the tracking is satisfactory, you are done.



Low Speed [non-observable] range tuning advices

0x2C13:000 [SLSM Low speed method] = [1] -Carrier Based [DEFAULT Setting]

- If the motor hums but does not start or takes longer than set time to accelerate, then increasing the HF Injection amplitude [0x2C10:001] may be necessary. Increase 0x2C10:001 in 10% increments to get satisfactory starting/acceleration.
- Set the HF injection range to a value lower than the lowest continuous or long-term operating speed for the application, but not lower than necessary for the application. This ensures the long-term/continuous operation will be in the high speed (observable) range.
- Some applications/motors perform better with faster acceleration through the low-speed range. If necessary, apply the 0x291B:000 [Auto-change.thresh.ramp2] for auto switching from accel ramp time 1 to ramp time 2.

"SLSM Low speed method" (0x2C13:000) = [2] - i/f based

- The most common problem with the low-speed range operation, in this mode, is instability and/or stalling when at the transition point from low-speed range to high-speed range. This is typically due to the injected current being higher than necessary. Tuning (typically reducing) the low-speed current values, "Acceleration current" (0x2C12:001) and "Standstill current" (0x2C12:002), is usually necessary, especially for applications with variable or quadratic torque profiles.
- Tuning of "Acceleration current" (0x2C12:001) and "Standstill current" (0x2C12:002) is this mode is a balancing act. Higher current values than necessary will cause instability while transitioning to the high-speed observable range. Lower current values may cause problems starting and driving the application in the low-speed range if high torque is required in that range.
- In this mode a higher transition point is typically beneficial. Reduction of the default [10%] should only be done if absolutely necessary for the application. Increasing to 20...30% can have stability benefits, if that application allows

4 PID – temperature and pressure control

Proportional Integral Differential (PID) control is a closed-loop method that monitors a process variable, such as pressure or temperature, and requires the fan to vary its speed in order for that variable to be held to a constant value.

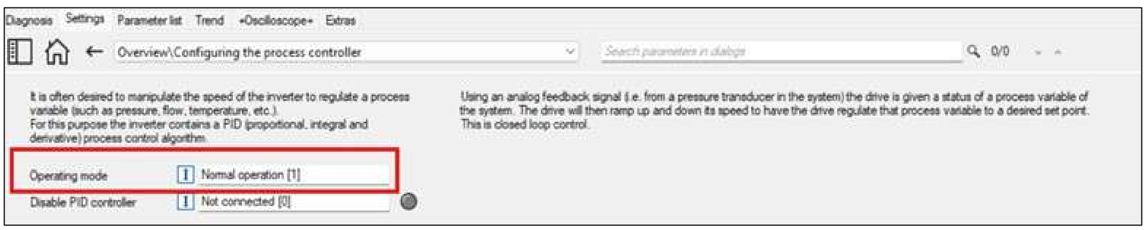
Common applications requiring PID control include heating, cooling or pressure.

First, an appropriate analog sensor is installed into the system. This could be a pressure sensor, a thermal sensor or other.

PID applications are either "normal acting" or "reverse acting". This term is from the perspective of the fan in relation to the monitored process variable. If an increase in the speed of the fan results in an increase in the monitored process variable (such as direct pressure), then the PID application is "normal acting". If an increase in the speed of the fan results in a decrease in the process variable (such as a fan supplying cooling air to a process monitoring temperature), then the process is "reverse acting".

Set the operating mode:

Set the "Operating mode" (0x4020:001 - P600:001) for either "Normal operation [1]" or "Reverse operation [2]" as appropriate for the application.

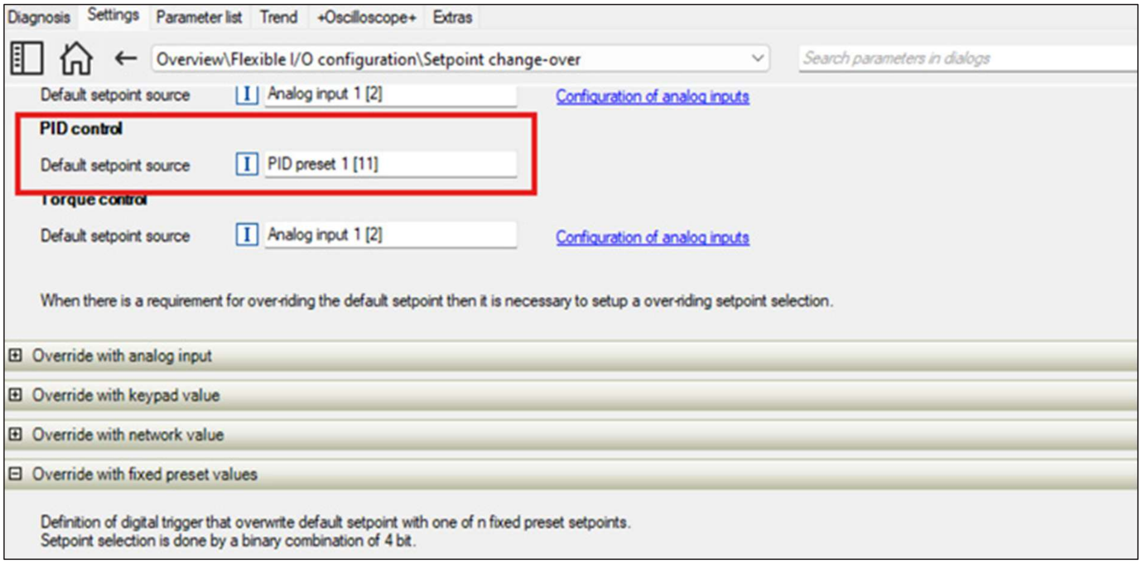


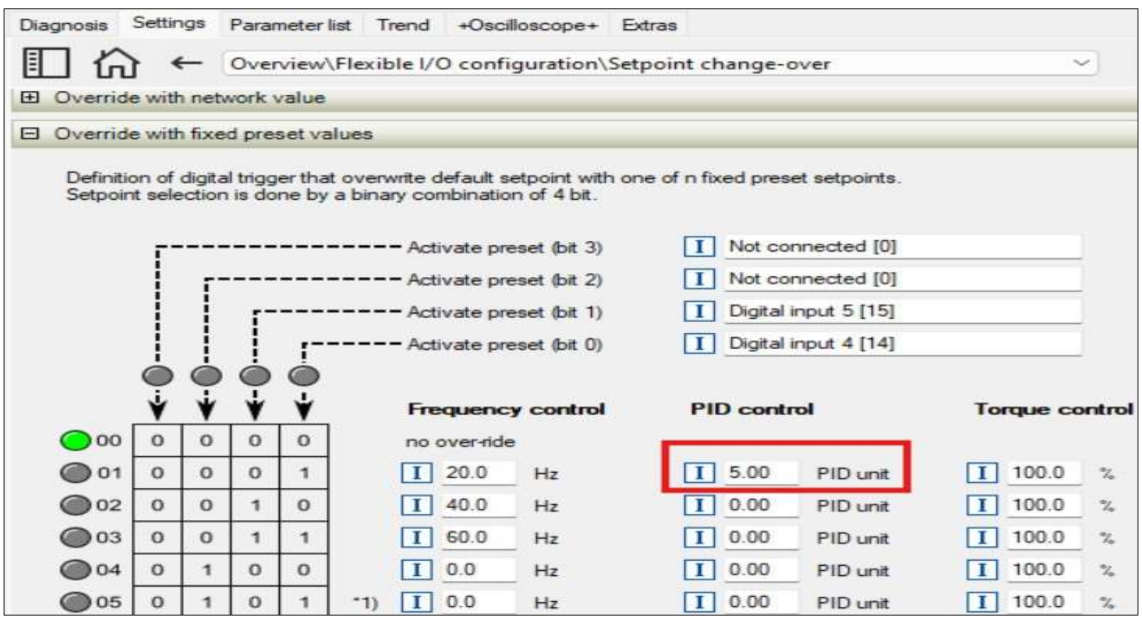
Progrram the analog input:

Next, we need to program which drive analog input will be used as the monitored process variable. Set "PID process variable" (0x4020:002 - P600:002) either equal to "Analog input 1 [1]" or "Analog input 2[2]".

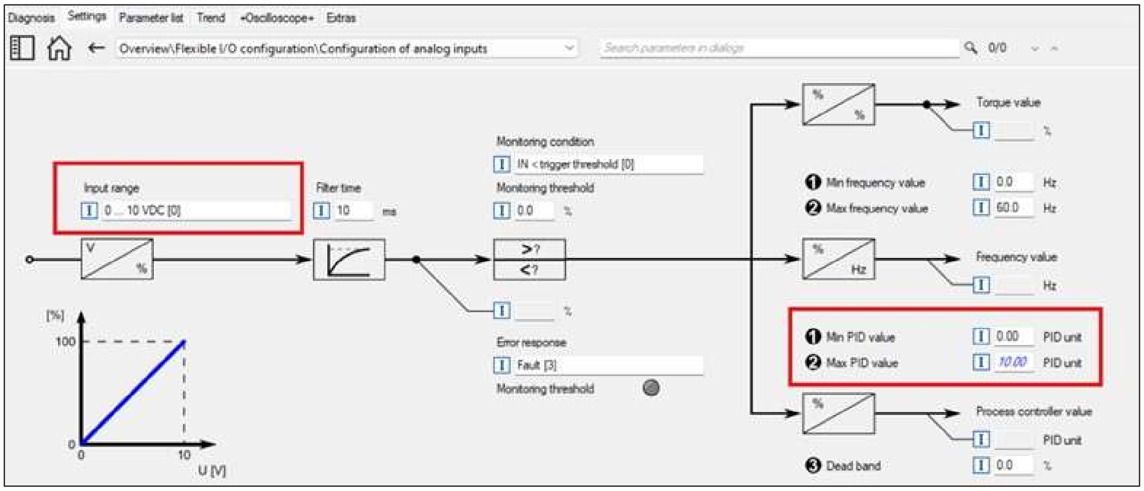
Program the setpoint source

Next, we need to program the drive for where the set point source is. The set point is the command value the drive is trying to get the monitored process variable to match. Set point sources can include the keypad, an analog signal (must not be the same analog input as the monitored process variable) or a predefined internal set point. Set "Default set point source" (0x2860:002 - P201:002)" to one of the following selections as appropriate: "Keypad [1]", "Analog input 1[2]", "Analog input 2[3]", or "PID preset 1 [11]". If you use "PID preset 1 [11]" as the setpoint, ensure you also program that desired set point value in "Preset 1" (0x4022:001 - P451:001).

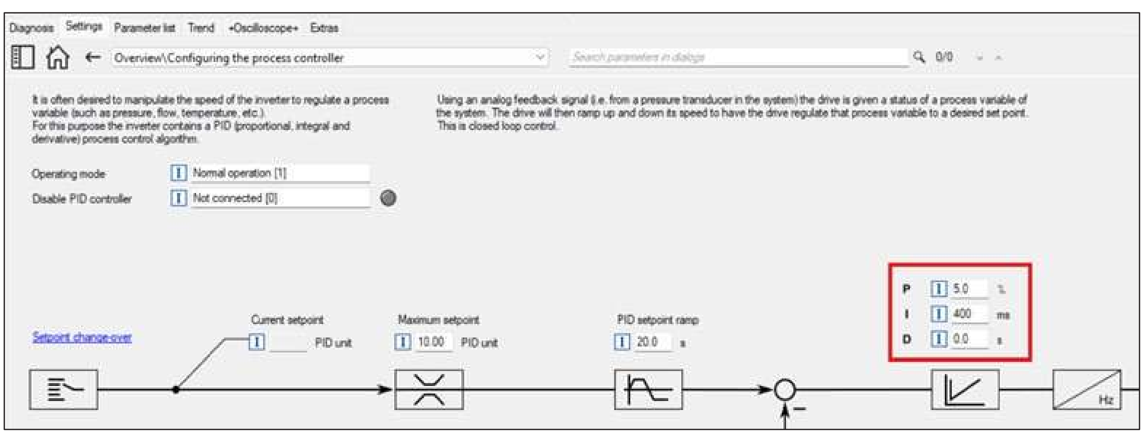




Please note, the set point value is in User defined PID units, which in turn are configured in the monitored process variable's analog input channel configuration. Program both the "Min PID value" (0x263x:004 - P43x:004) and the "Max PID value" (0x263x:005 - P43x:005) to match the signal range of the analog sensor used to monitor the process variable.
Enter this value in PID units (so if the sensor was 0-10VDC = 0-10PSI, set 0x263x:004 - P43x:004 = 0 and 0x2363x:005 - P43x:005 = 10)



PID tuning:
The PID loop must then be tuned on the running system for the application. A common approach to PID tuning is the following.
1. To deactivate the I-component, set the reset time for the I-component to 6000 ms in “PID I-component” (0x4049:000 - P602:000). With this setting and the default setting of “PID D-component” (0x404A:000 - P603:000), the process controller operates as P controller.
2. Increase gain of the P-component step by step in “PID P-component” (0x4048:000 - P601:000) until the system becomes
unstable (oscillates).
3. Reduce the gain again until the system is stable again (stops oscillating).
4. Reduce the gain by another 15%.
5. Set reset time for the I-component in “PID I-component” (0x4049:000 - P602:000). With this setting it should be noted that too low reset time may cause overshoots, especially in case of high steps of the system deviation.
6. Optional: set the gain of the D component in “PID D-component” (0x404A:000 - P603:000).
With this setting it should be noted that the D-component responds very sensitively to electrical noise disturbances on the feedback, as well as digitization errors. For most systems, the “PID D-component” (0x404A:000 - P603:000) may be left at a value of 0. This is typically only required for extremely fast acting systems.



5 Skip frequencies

The sleep function (also called “Process controller idle state”) causes the drive to stop running as a reaction to detection of the process variable unchanging despite the output of the drive falling below a given frequency for a period of time. An example of an application requiring this is a fan in a warehouse. At 3:00AM the outside temperature has cooled down below the setpoint in the warehouse, so we want the drive to stop running the fan in order to conserve energy.

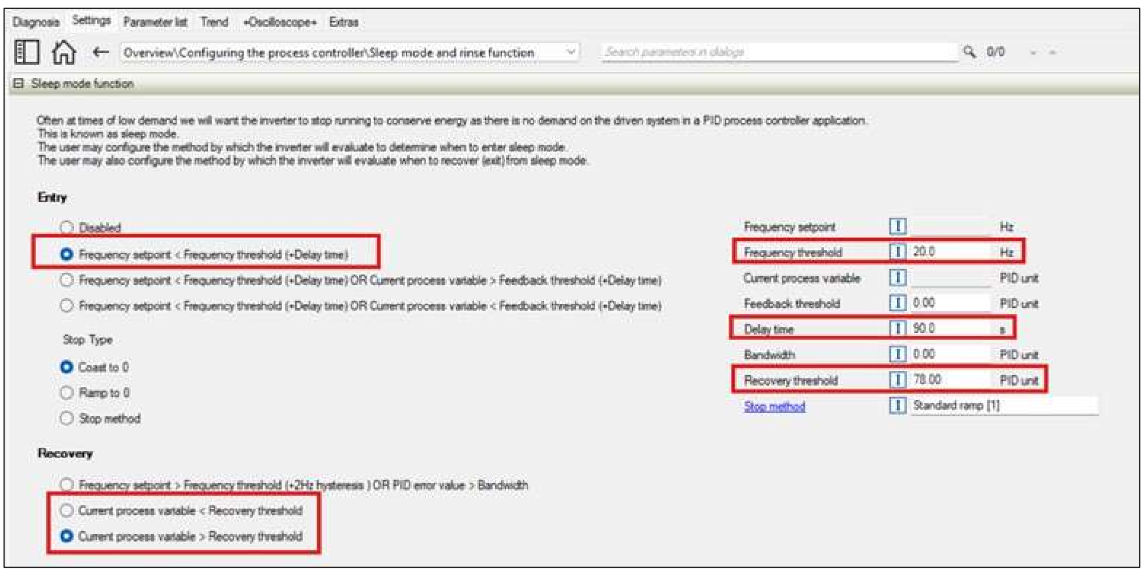
The “PID sleep mode: Activation” (0x4023:001 - P610:001) should be set to “Output freq.< threshold [1]” for a fan. The “Frequency threshold” (0x4023:003 - P610:003) must be set for a low value determined for the application to be just below the minimum airflow rate being required. A “Delay time” (0x4023:005 - P610:005) must be entered. Select a value that ensures the application has the fan shut off. If too short a time period is selected the application may chatter.

A fan application recovery is typically desired to occur based upon the monitored process variable either falling

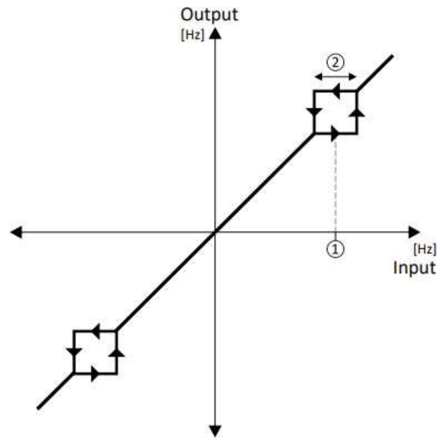
(for a normal

acting PID application i.e. heating) or rising (for a reverse acting PID application i.e. cooling) outside of a tolerance window. Set the “Recovery” (0x4023:006 - P610:006) to either “PVar<recovery thresh. [1]” for normal acting PID applications or to “PVar>recovery thresh. [2]” for reverse acting PID applications.

Finally, set the “Recovery Threshold” (0x4023:008 - P610:008) for the maximum value which the application can tolerate as a variance for the monitored process variable. This value is entered in user defined PID units and is in scale. (i.e. if the process set point was 70° and a max increase to a value of 78° could be tolerated, enter 78°).

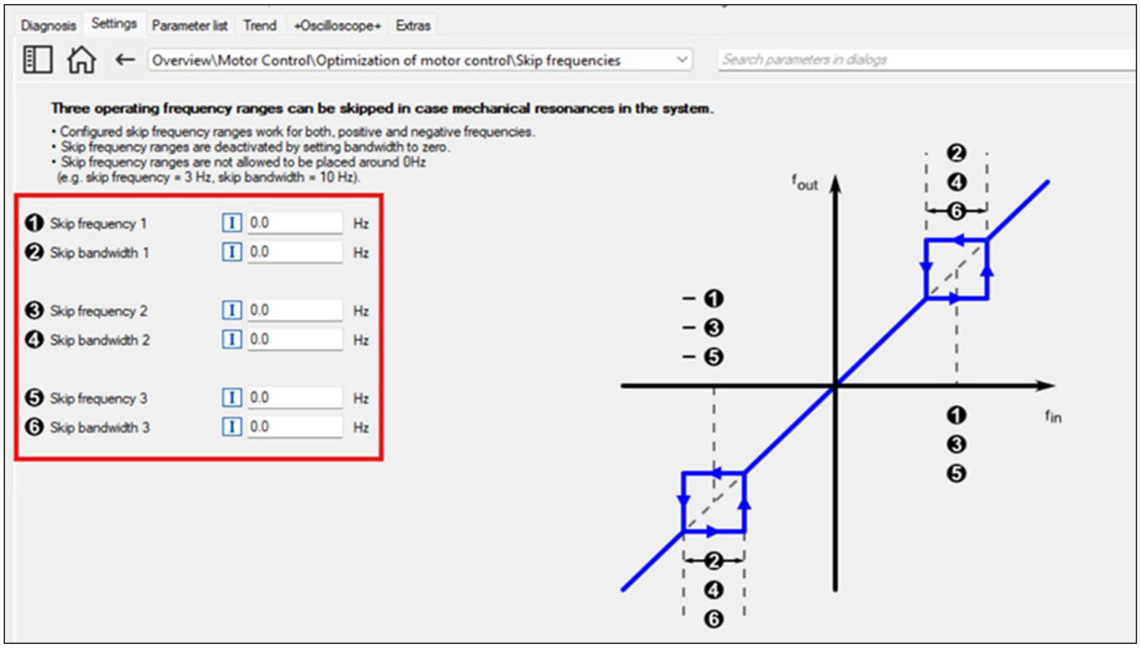


Fan systems can have inherent natural mechanical resonance frequencies which must be avoided to not damage the machine. i500 series drives have three skip frequencies that can be used to lock out up to three critical frequency zones for that purpose. Details A blocking zone is active as soon as the frequency for this blocking zone is
set to a value ≠ “0 Hz”.
– The frequency defines the center of the range to be masked out ⍰
– The bandwidth defines its total size — frequency ⍰

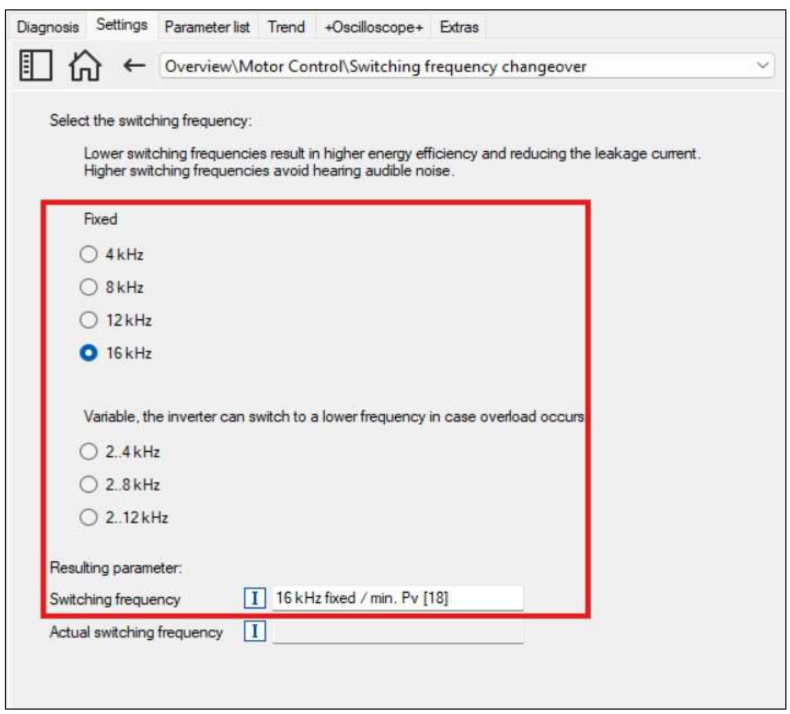


Example: For a blocking zone, the frequency is set to 20 Hz and the bandwidth to 10 Hz. These settings mask out the range from 15 Hz to 25 Hz.
Notes:
– Skip frequencies are absolute values. With the setting “20 Hz”, at the same time the skip frequency “–20 Hz” is defined
– The drive accelerates/decelerates the motor through the range to be masked out. Continuous operation in this range is not possible.
– A blocking zone is not active if its bandwidth is set to “0 Hz”. Below are the parameters to define the three available zones:

Address	Name / setting range / [default setting]	Information
0x291F:001 (P317.01)	Skip frequencies: Skip frequency 1 (Skip frequencies: Skip frequency 1) 0.0 ... **[0.0]** ... 599.0 Hz	Center of frequency range 1 which is to be skipped.
0x291F:002 (P317.02)	Skip frequencies: Skip bandwidth 1 (Skip frequencies: Skip bandwidth 1) 0.0 ... **[0.0]** ... 10.0 Hz	Size of frequency range 1 which is to be skipped.
0x291F:003 (P317.03)	Skip frequencies: Skip frequency 2 (Skip frequencies: Skip frequency 2) 0.0 ... **[0.0]** ... 599.0 Hz	Center of frequency range 2 which is to be skipped.
0x291F:004 (P317.04)	Skip frequencies: Skip bandwidth 2 (Skip frequencies: Skip bandwidth 2) 0.0 ... **[0.0]** ... 10.0 Hz	Size of frequency range 2 which is to be skipped.
0x291F:005 (P317.05)	Skip frequencies: Skip frequency 3 (Skip frequencies: Skip frequency 3) 0.0 ... **[0.0]** ... 599.0 Hz	Center of frequency range 3 which is to be skipped.
0x291F:006 (P317.06)	Skip frequencies: Skip bandwidth 3 (Skip frequencies: Skip bandwidth 3) 0.0 ... **[0.0]** ... 10.0 Hz	Size of frequency range 3 which is to be skipped.

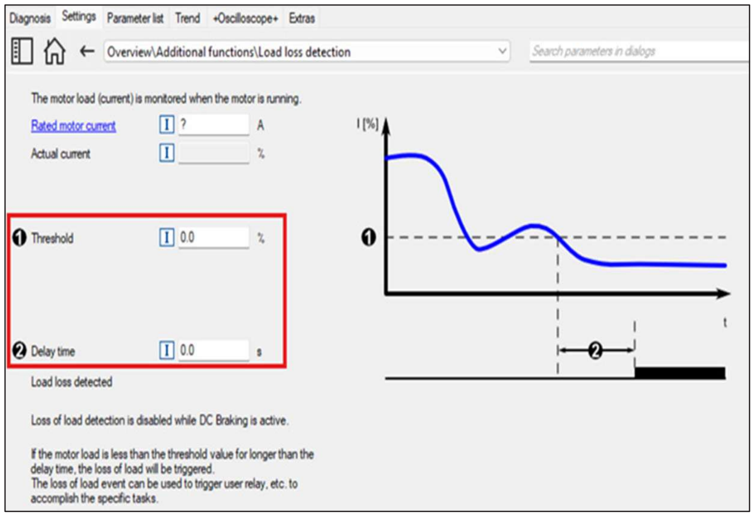


6 Carrier frequency selection and audible noise



"Switching frequency" (0x2939:000- P305:000) sets the carrier frequency (switching frequency) of the drive's output IGBT's. Higher switching rates result in less audible noise (electric motor whine) emitted from the motor, but the efficiency of the drive decreases as the carrier frequency rises. Therefore, this parameter should be set to the lowest value which yields acceptable sound levels. Most people cannot hear excessive electric motor whine at frequencies of 8kHz; however, some are more susceptible to that audible frequency. I500 series drives allow settings up to 16kHz to elevate the frequency beyond the range of human hearing.
It must be noted that lower carrier frequencies should be used if leakage current is a concern for GFCI or RCD compatibility. It should also be noted that the ability to operate a drive at higher carrier frequencies depends on the drive's horsepower rating, driven load, drive enclosure, and ambient temperature. Consult the derating factors in the drive's Project Planning guide for specific data for your application.

7 Belt break / loss of load detection for Axial fans

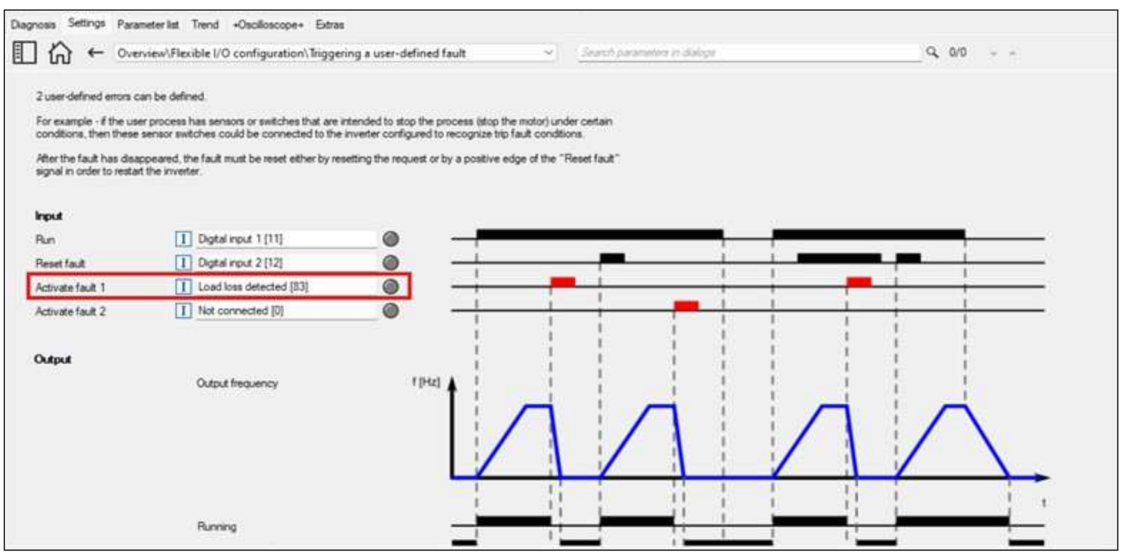


Axial fans typically employ a rubber belt to connect a pulley on the motor shaft to the fan's sheave (pulley). i500 drives can be programmed to detect and fault in response to a belt break.

First, examine "Current actual value" (0x6078:000 - P103.000) while the fan is running in the system's normal stable condition at its lowest operating speed.

Then observe "Current actual value" (0x6078:000 - P103.000) at the same speed with the belt removed from the fan. Determine a safe value between those two levels to account for variability of the system. Enter that value into "Threshold (0x4006:001 - P710.001)". Next, we need to add some delay to the detection to prevent trips during startup or sudden changes due to starting/stopping valves. Determine a safe time period and enter that into "Delay time (0x4006:002 - P710.002)".

Finally, assign either "Activate fault 1 (0x2631:043 - P400:043)" or "Activate fault 2 (0x2631:044 -P400:044)" to "Load loss detected [83]" to fault the drive with either "User-defined fault 1" or "User-defined fault 2" based upon the belt break occurring.



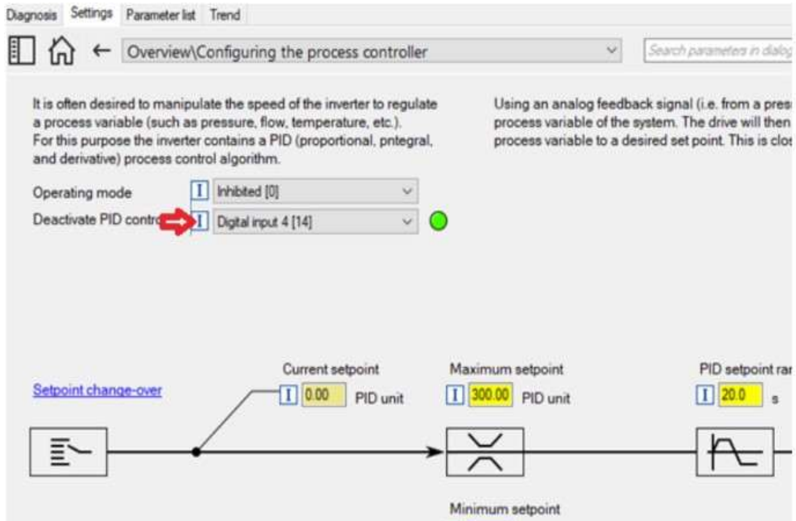
8 Purge – in PID applications

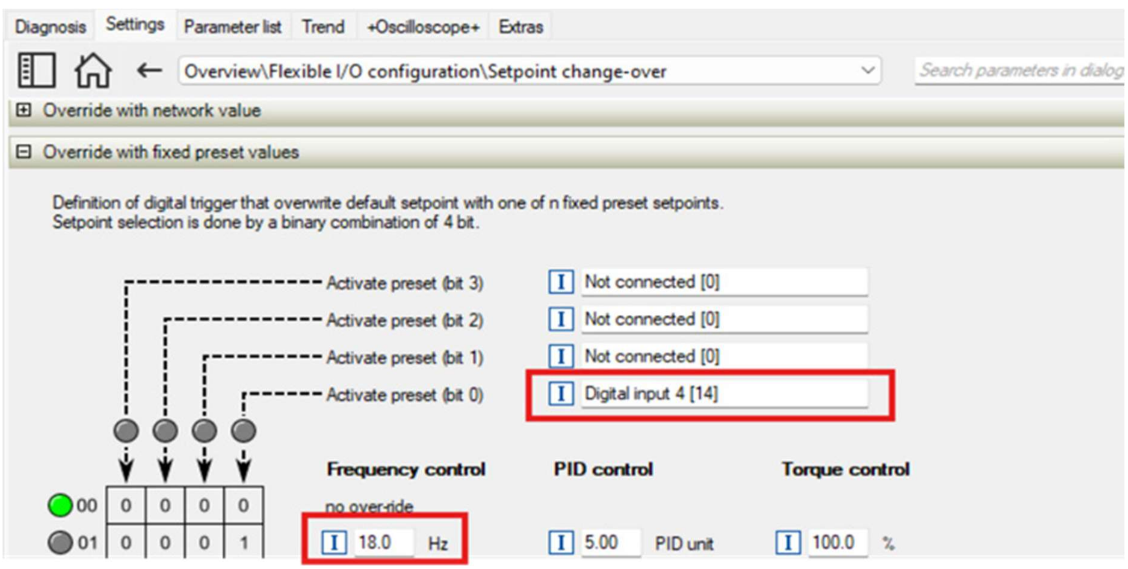
Often in fan applications that employ PID, a Purge function is desired to clear the area of fumes or other conditions or simply to pass a maximum amount of airflow. This function temporarily overrides the PID control and sets the fan to run at a predefined speed (usually full speed).

First, set "Deactivate PID controller" (0x2631:045 - P400:045) = to the desired Digital Input to trigger the Purge (i.e. "DI4 [14]").

Next, set "Activate preset (bit 0)" (0x2631:018 - P400:018) to be triggered by the same Digital Input to trigger the purge (i.e. "DI4 [14]").

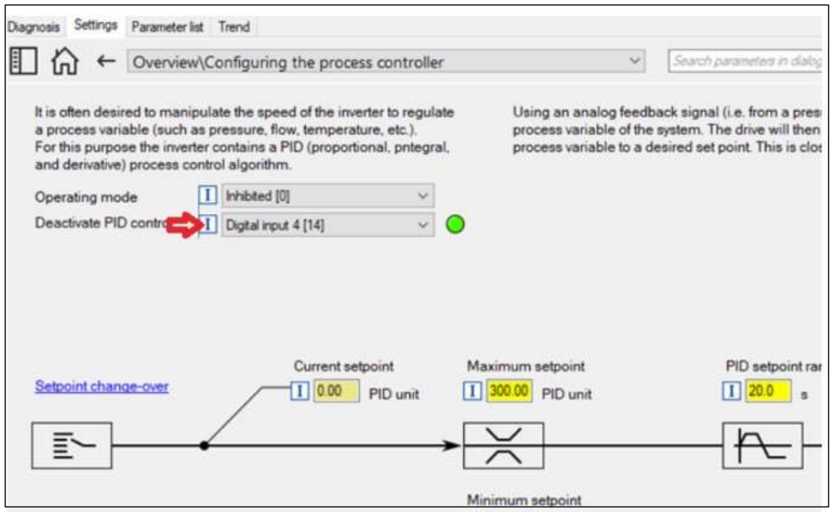
Finally, set the Purge speed (i.e. 60Hz) in "Preset 1" (0x2911:001 - P450:001).





9 De-Icing

Normal de-icing operations in cooling towers typically command the drive to stop, so warm water melts the ice buildup. If the ice buildup is excessive, a more aggressive de-icing can be performed. This involves taking the drive out of PID operation and running the fan in reverse at a relatively low speed (typically 30%).

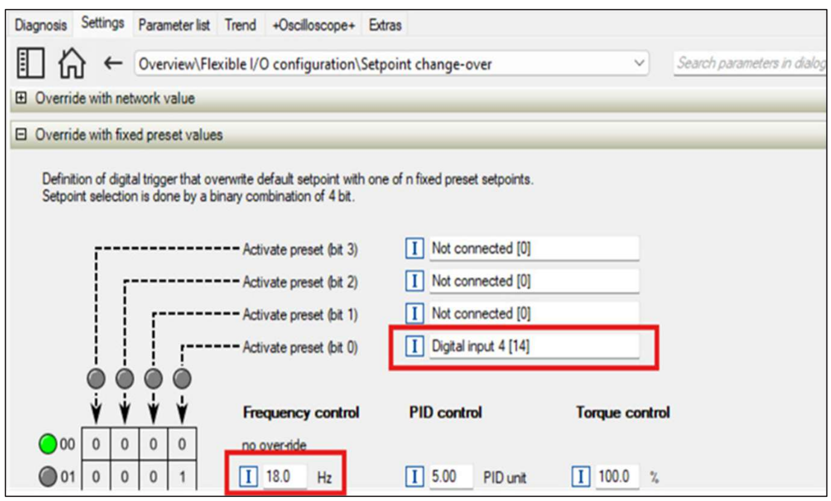


Trigger the de-icing:

To do this, first, set "Deactivate PID controller (0x2631:045 -P400:045)" = to the desired Digital Input to trigger the De-icing (i.e. "DI4 [14]").

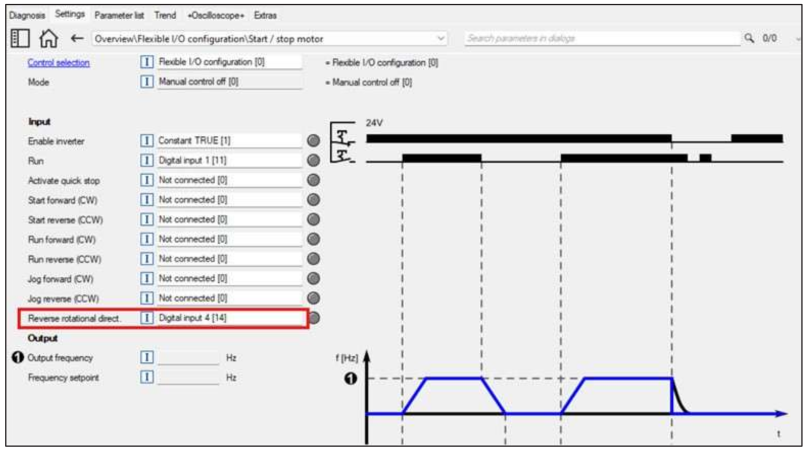
Trigger the speed:

Next, set "Activate preset (bit 0)" (0x2631:018 - P400:018) to be triggered by the same Digital Input to trigger the speed (i.e. "DI4 [14]") and set the Reverse speed (i.e. 18 Hz) in "Preset 1" (0x2911 - P450:001).



Direction of rotation

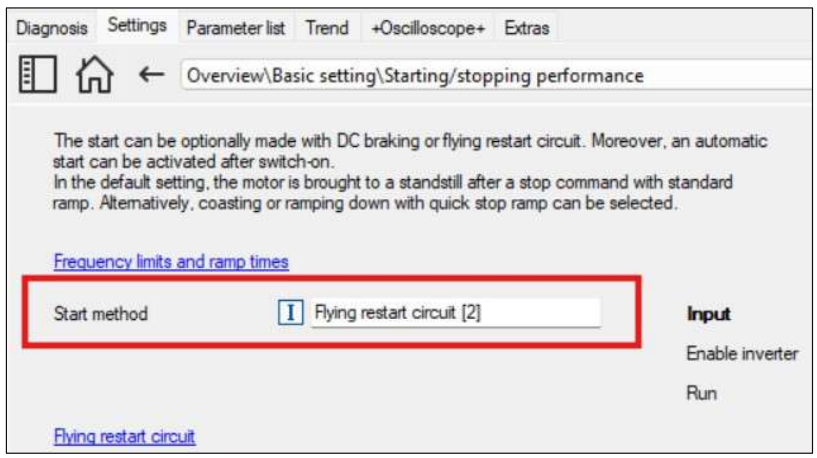
Next set “Reverse rotation direction” (0x2631:013 – P400:013) to also be triggered by the same Digital Input (i.e. DI4 [14]) to reverse the fan’s direction of rotation.



10 Flying restart (windmilling)

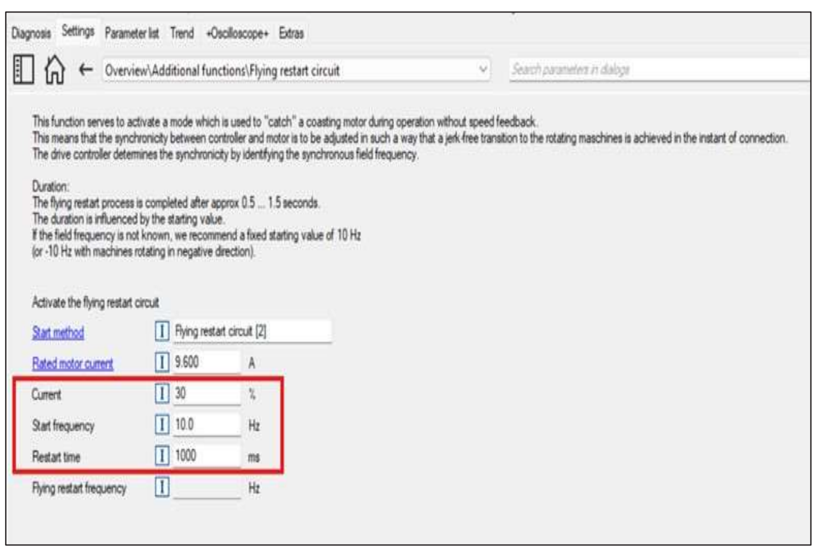
Idle fans are subject to windmilling caused by drafts. As such, the start of those into operation must be controlled. i500 series drives feature a flying restart algorithm to detect motor speed, catch it and ramp the motor into normal operation.

To set the drive to perform a flying restart set “Start method” (0x2838:001 – P203:001) = “Flying restart circuit [2]”.



The flying restart circuit should be further configured, so that operation is as jerk free as possible. Current should be applied at a low fraction of the motor rated current. A good value to start with is 30%. Set “Current “(0x2BA1:001 – P718:001) = 30.

Usually the start frequency is unknown. In this case, Lenze recommends starting the search at 10.0 Hz. Set “Start frequency” (0x2BA1:002 – P718:002) = 10.0. The restart process can take approximately 0.5-1.5 seconds to complete. A good value to start with is 1000 msec. Set “Restart time” (0x2BA1:003 – P718:003) = 1000.

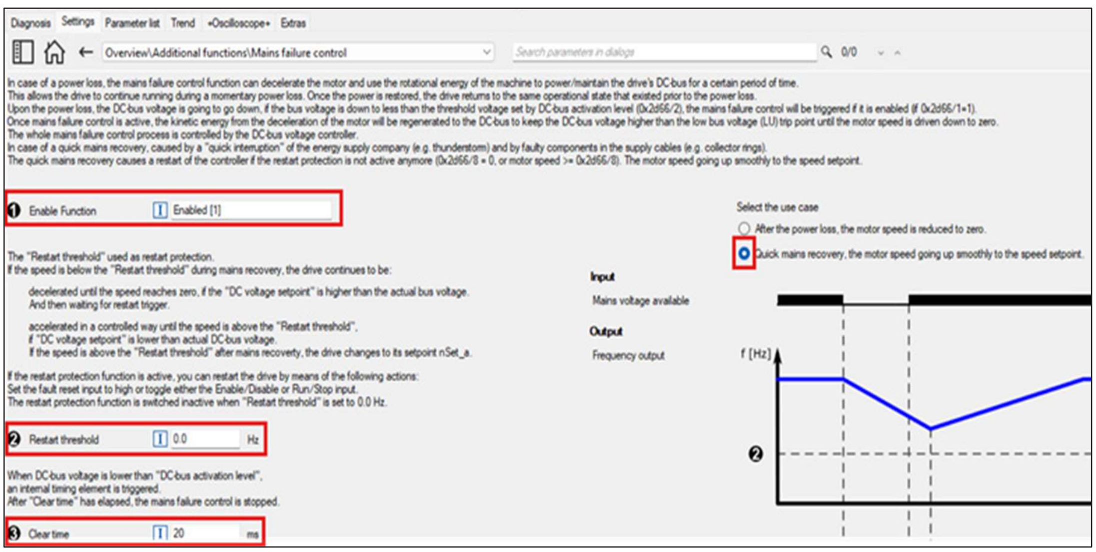


11 Power loss ride through

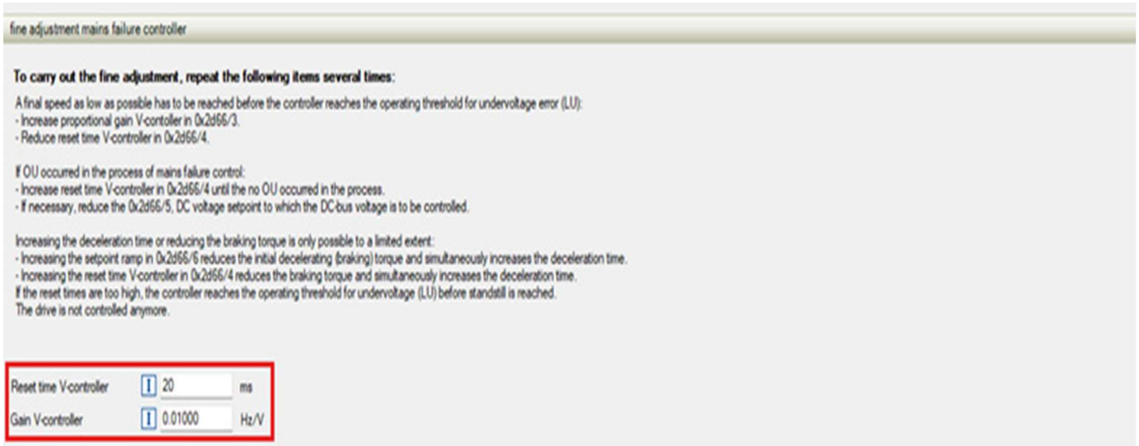
In fan applications, it is often more desirable for a drive to maintain control at the expense of fan speed rather than having to go through a flying restart because of a momentary power loss. I500 series drives can use a fan's momentum to regenerate power to maintain control during a momentary loss of mains.

Setup is as follows:

1. Set "Enable function" (0x2D66:001- P721:001) = Enabled [1].
2. As we are looking for ride through and automatic recovery, select the use case "Quick mains recovery, the motor speed going up smoothly to the speed setpoint" and set the "Restart threshold" (0x2D66:008 – P721:008) = 0.0 Hz to disable the restart protection feature, so the drive may auto restart.
3. The "Clear time" (0x2D66:007 – P721:007) must be set to define the maximum amount of time for which the ride through will be attempted to be maintained. This should be set to a reasonable value for the momentum in the rotating fan. The larger and faster the fan, the more time this may be set for. The proper way to determine what may be set is to run the drive at normal rated speed, disable the fan and then measure with a stopwatch the amount of time it takes the fan to coast to a minimal speed. Set the "Clear time". To this value.

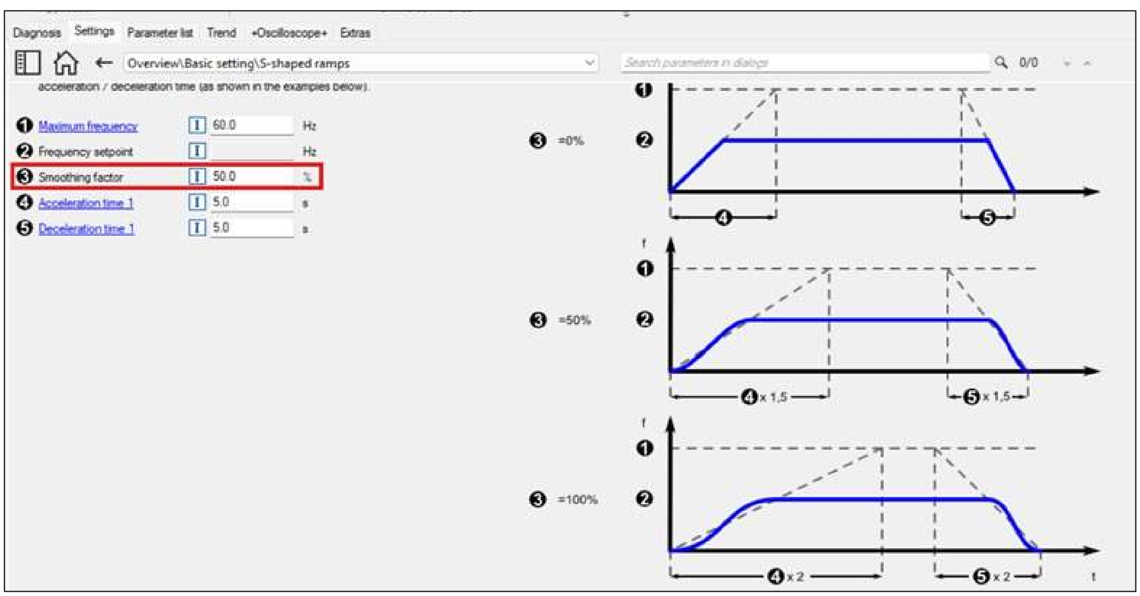


1. Set the "DC voltage setpoint" (0x2D66:005 – P721:005) to 95%, so the drive will attempt to maintain 95% of the rated DC bus voltage.
2. The "Setpoint ramp" (0x2D66:006 – P721:006) defines the rate at which the drive will attempt to increase the bus voltage back to its setpoint. This value should be set to 1/10'th the value of the "Clear time" (0x2D66:007 – P721:007).
3. Set the "DC-bus activation level" (0x2D66:002 – P721:002) to 72% for 120V and 230V drives or to 82% for 400/480V and 480V/600V drives.



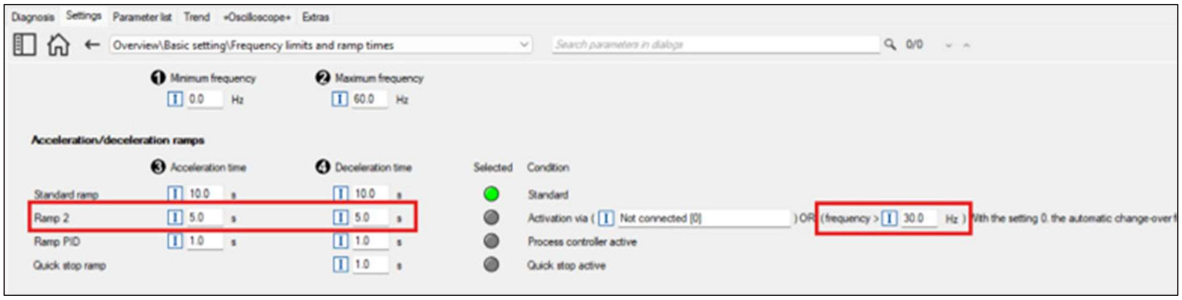
12 Minimize motor load, jerk and overshoot for high inertia fans

Jerk and speed overshoot may be minimized in high inertia fan applications by employing S-shaped acceleration/deceleration ramps. This will however, lengthen the overall acceleration/deceleration times of the drive. To employ S-Shaped ramps simply program in the “Smoothing factor” (0x291E:001 – P226:001). 50% is a good starting point for smoothing with typical large inertia fans.



Additionally, the i500 series drives feature a second acceleration/deceleration ramp which may be automatically triggered when the drive exceeds a frequency threshold. This is useful to gradually accelerate at low speeds at high inertia, while allowing faster response at or near rated speed.

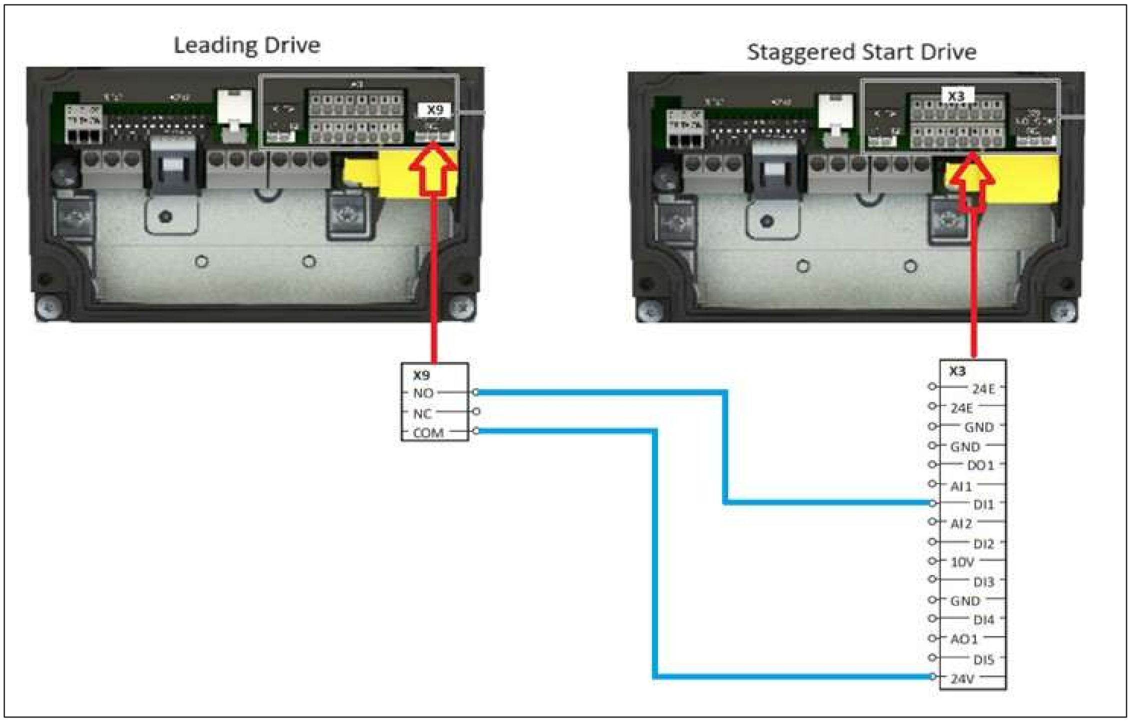
To configure this option, first program the secondary ramp rates into “Acceleration time 2” (0x2919:000 – P222:000) and “Deceleration time 2” (0x291A:000 – P223:000). Next program the “Auto-change.thresh.ramp2” (0x291B:000 – P224:000) frequency.

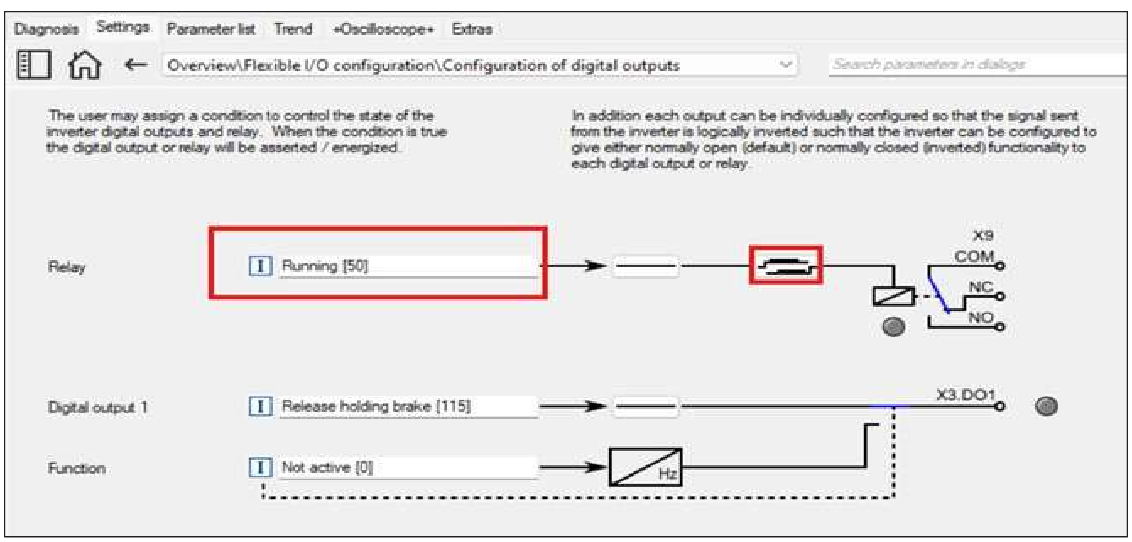

Diagnosis
Settings
Parameter list
Trend
»Oscilloscope«
Extras
Overview\Basic setting\Frequency limits and ramp times
Search parameters in dialogs
0/0
Minimum frequency
0.0 Hz
Maximum frequency
60.0 Hz
Acceleration/deceleration ramps
Acceleration time
Deceleration time
Selected
Condition
Standard ramp
10.0 s
10.0 s
Standard
Ramp 2
5.0 s
5.0 s
Activation via (Not connected [0]) OR (frequency > 30.0 Hz)
Ramp PID
1.0 s
1.0 s
Process controller active
Quick stop ramp
1.0 s
Quick stop active

13 Staggered start of system drives without PLC

Sometimes users need to lower the current demand of the supplying mains during system start up. They may do this by staggering the fans starting in the application. To do this without an upper-level controller, use the relay output of one drive to trigger the start of the next subsequent drive by programming a switch on delay for the relay.

Wire the relay output of the leading drive to trigger the input configured as the RUN command of the following drive.





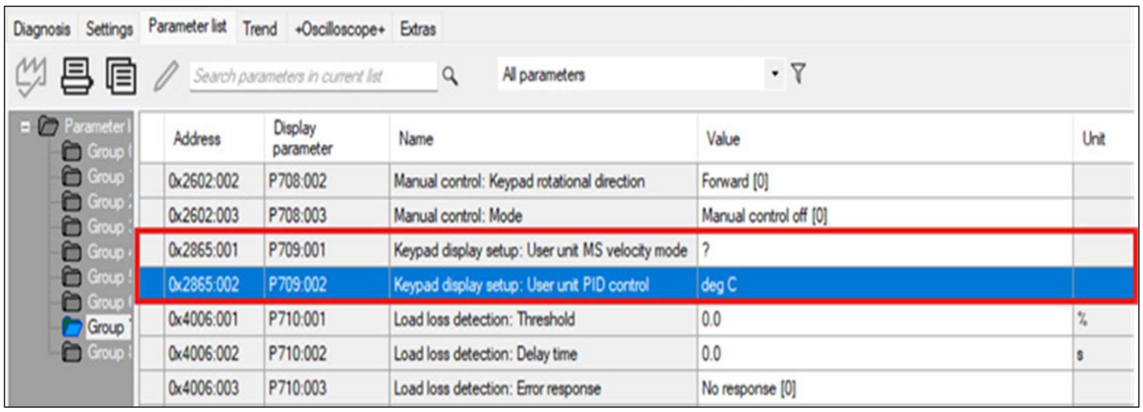
Next, configure that relay output to come on when the drive is running by setting "Relay" (0x2634:001 – P420:001) = Running [50].

14 Keypad user units

The keypad for i500 cabinet series and i500 protec series drives may have the legend of the run screen changed to any 6 ASCII

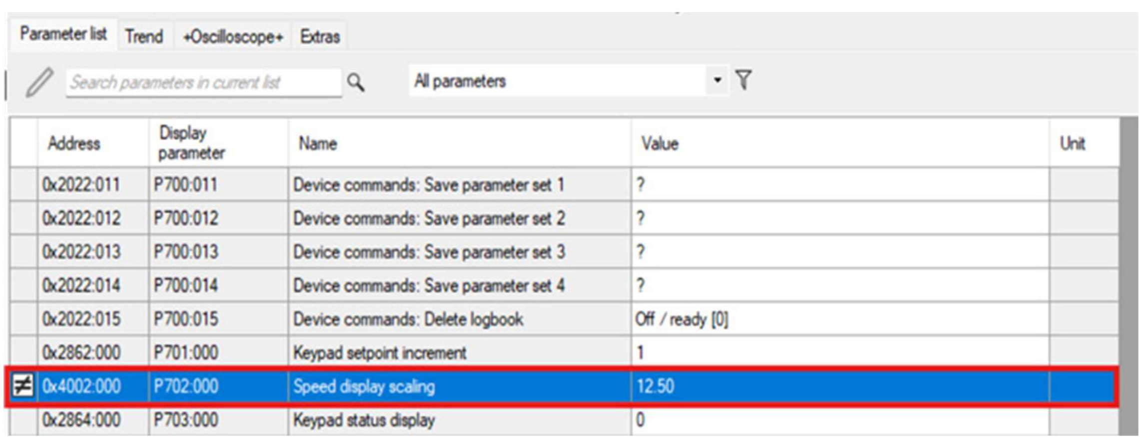
characters so that the display makes sense for the actual application (i.e., “deg F,” “deg C,” “ft/sec,’ etc.). If the drive is in PID mode, set the legend in “User unit PID control” (0x2865:002 – P709:002).

If the drive is in velocity mode, set the legend in “User unit MS velocity mode” (0x2865:001 – P709:001).



Address	Display parameter	Name	Value	Unit
0x2602:002	P708:002	Manual control: Keypad rotational direction	Forward [0]	
0x2602:003	P708:003	Manual control: Mode	Manual control off [0]	
0x2865:001	P709:001	Keypad display setup: User unit MS velocity mode	?	
0x2865:002	P709:002	Keypad display setup: User unit PID control	deg C	
0x4006:001	P710:001	Load loss detection: Threshold	0.0	%
0x4006:002	P710:002	Load loss detection: Delay time	0.0	s
0x4006:003	P710:003	Load loss detection: Error response	No response [0]	

Also in velocity mode, program in a multiplier with “Speed display scaling” (0x4002:000 – P702:000) to convert Hz to the desired units (i.e., if 60Hz corresponds to 750 ft/sec, enter in a value of 12.50).



Address	Display parameter	Name	Value	Unit
0x2022:011	P700:011	Device commands: Save parameter set 1	?	
0x2022:012	P700:012	Device commands: Save parameter set 2	?	
0x2022:013	P700:013	Device commands: Save parameter set 3	?	
0x2022:014	P700:014	Device commands: Save parameter set 4	?	
0x2022:015	P700:015	Device commands: Delete logbook	Off / ready [0]	
0x2862:000	P701:000	Keypad setpoint increment	1	
0x4002:000	P702:000	Speed display scaling	12.50	
0x2864:000	P703:000	Keypad status display	0	

15 i550 motec specialties & Re-Generation

i-series motec drives up to 45 kW feature a full regenerative capable front end. This presents the possibility for energy capture when used with PMAC motors in fan applications subject to lengthy periods of windmilling. An example of such an application is an

industrial agriculture barn in California. PMAC motors are used on the barn fans for energy efficiency. During morning, the barn doors are open as high winds and cool temperatures do not require the use of the fans. The installed fans all windmill during this period allowing energy to be fed back onto the mains by the i-series motec for use by other equipment. During afternoon, the doors are closed due to rising temperatures, and fans are used for cooling.

Increase the base output voltage on the i550 motec

The maximum possible output voltage depends on the DC link voltage. Using the service setting - Limit Output Voltage 0x2DE0:029, the base output voltage on the inverter can be increased by approximately 30.0 V. This practically restores the 400 V at the frequency converter output, just like at the mains supply.

To do this, change the parameter **0x2DE0:029** from "Automatic (**0**)" to "Average (**2**)".

16 BACnet & Firemode

BACnet OEM offering

While not available for general market sales, Lenze offers a variant of the i510 cabinet frequency drive with BACnet MSTP (the device profile is that of a BACnet® Application Specific Controller (B-ASC)) for high volume serial producing OEMS. Consult with your local Lenze sales engineer to discuss your opportunity.

Firemens Override / Fire Mode

Building automation systems may employ a Fireman’s override function that when triggered, causes the drive to ignore all faults and continue to attempt to run until either the drive and/or the motor are destroyed. This is utilized during a fire for pressurizing a stairwell to keep smoke out as long as possible, allowing people the longest possible opportunity to escape or be rescued from a burning building. Lenze is developing this feature for the i-series drives and will be releasing it with a firmware update in 2025.

17 Disclaimer

This guide is provided for informational purposes only. While every effort has been made to ensure the accuracy of the information, we cannot guarantee that it is free from errors or omissions. Users are advised to verify any information before relying on it. We accept no liability for any loss or damage caused by reliance on this guide.