15W0132B150
SINUS S
Overhead crane – Gantry and Trolley control
Parameter setting using Remote Sinus
R.00 30/03/2022

Summary

Figure 1   **Lateral side view**
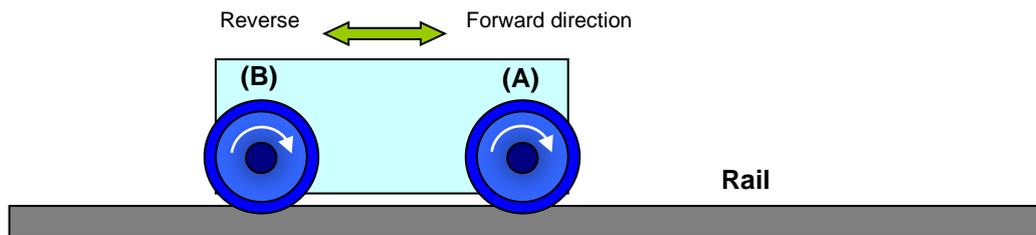
Figure 2

1. Wirings and configuration

I/O configuration

Sinus S
(Standard I/O)

X9

DI1 DI2 DI3 DI4 DI5 24V   NC COM NO

DI1 is mandatory.
If it is not managed,
close permanently
the input.

To the
Holding
mechanical Brake

Run
(Start)

Reset Fault

Run Forward

Run Reverse

Speed 2

Fig. 3

Power Supply

Power configuration

L1   L2   L3

Sinus S

Rb1   Rb2   U   V   W

Thermal Relay   Thermal Relay

Braking resistor

Fig. 4

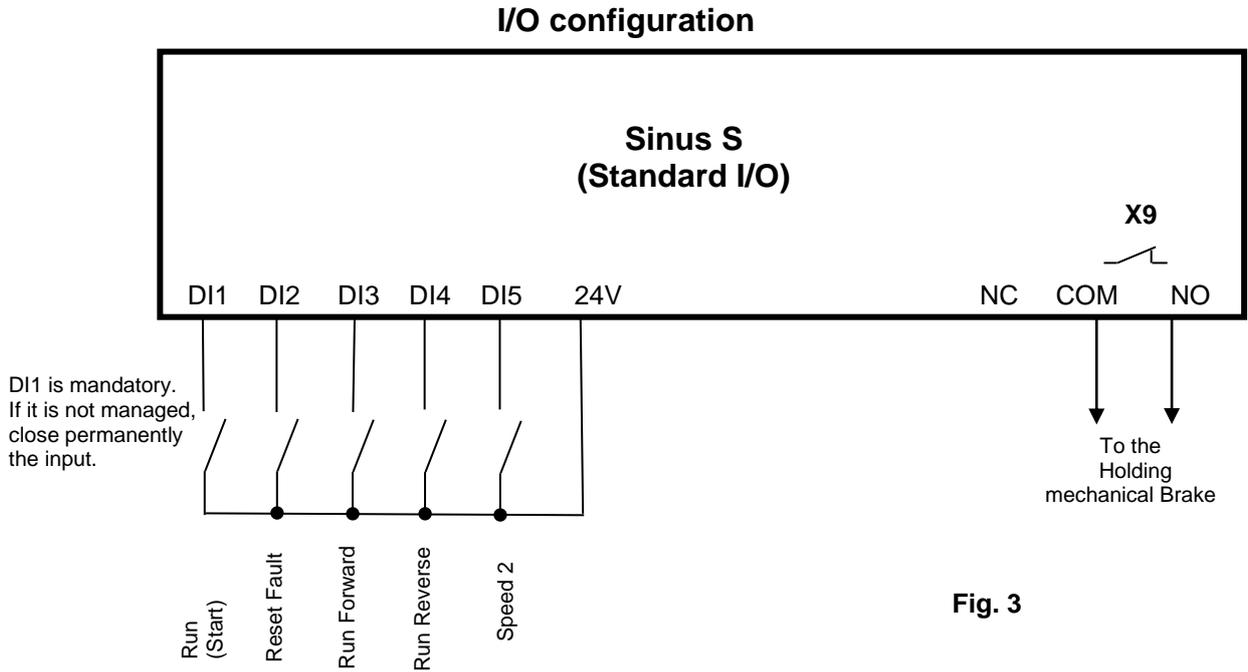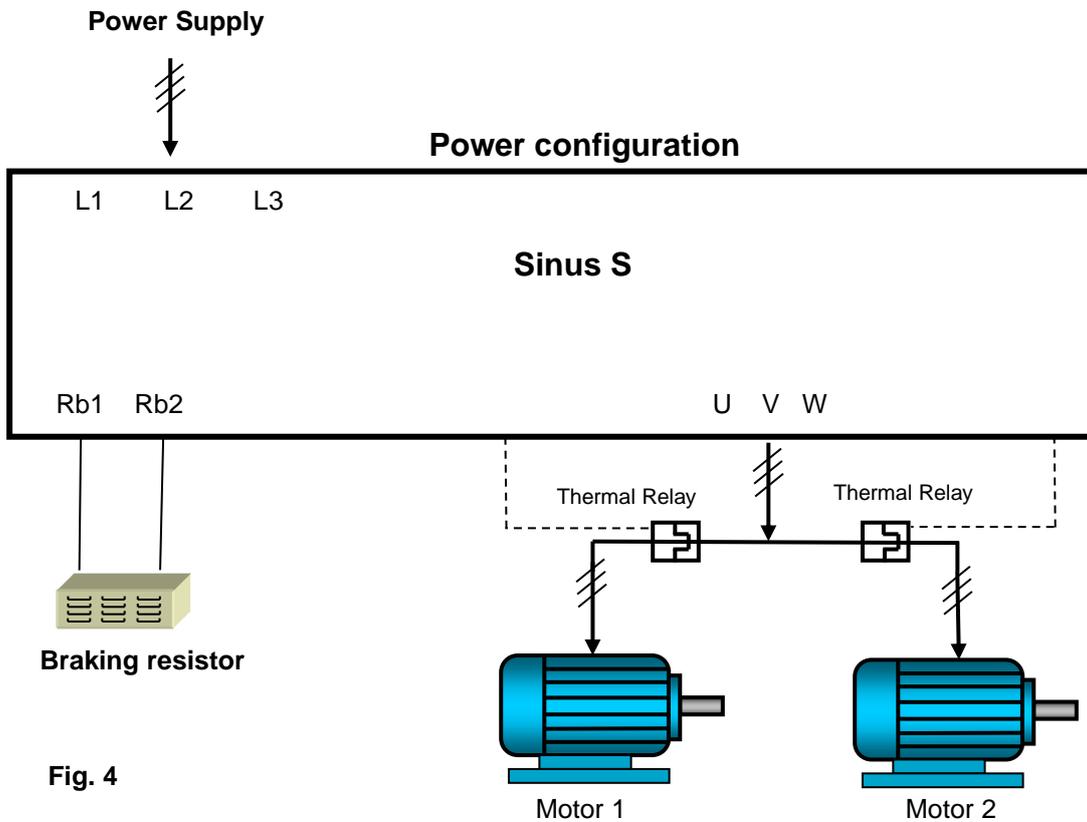Motor 1   Motor 2

2. Description

This guide is made for the translation (gantry and trolley) of a crane. The drive can control one or more motors connected in parallel (in this guide 2 motors are shown): the important thing is that the power of the motors MUST NOT be greater than the inverter nominal power.

For example, there are 2 motors and each motor is 2 kW. If the inverter is 5.5 kW, the inverter will control both the motors without problems, if the inverter is less than 4kW, it will be damaged.

Moreover, it is possible to have different preset speeds (in this guide will be shown a 2 speeds crane) and it is also possible to control a mechanical brake.

When there is more than 1 motor, we suggest you to protect each motor with a thermal overload relay. This must not open the circuit, but it must stop the inverter. It is possible to give an external alarm to the inverter through a NC contact.

2.1. Installation

Connect the grid and the motor to the inverter as shown in the pictures.

NOTE **The motor must always be directly connected to the inverter without fuses or switches**.

Connect the braking resistor, using Rb1 and Rb2. Be sure that the ohmic value is greater than the minimum admissible value for that size of inverter. See the Sinus S Accessories Manual **15W0132B100** for the minimum ohmic values.

The mechanical brake is directly controlled by the inverter through the digital output or relay.

3. Example of setup

3.1. Overview
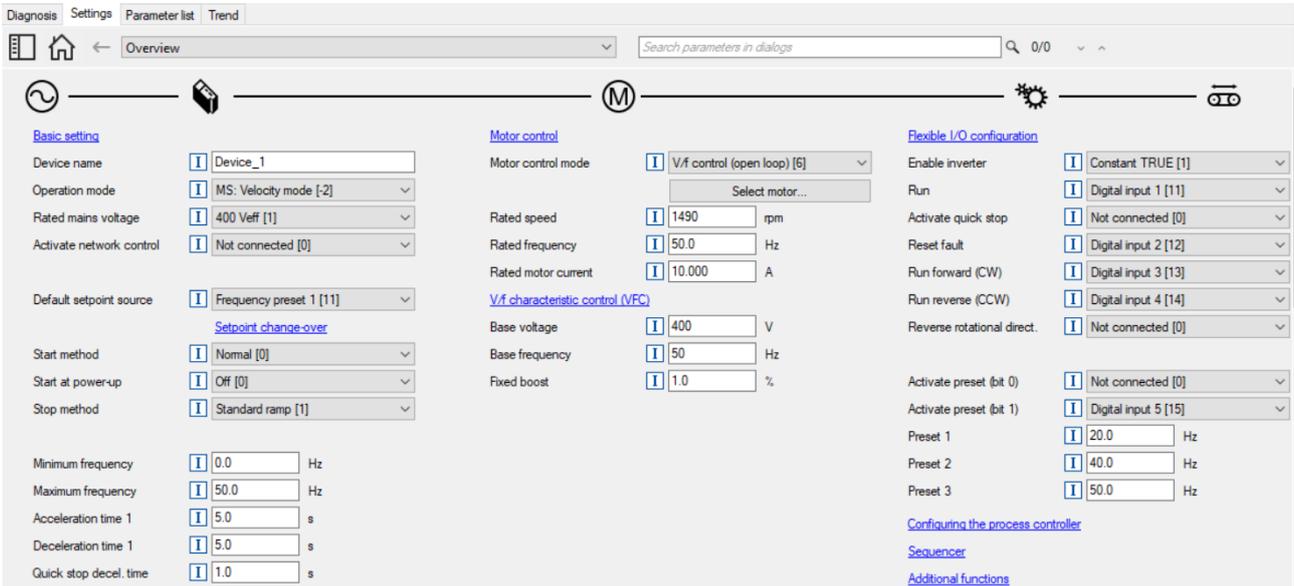
As shown in picture, it is possible to set the main parameters from the Overview window.

After programming motor parameters (control mode, rated current, rated speed, rated frequency), it is possible to set I/O configuration.

In this example, preset speeds have been programmed by setting **P201:001** (*Default setpoint source)* = *Frequency preset 1[11]*.

In this way when the user will close:

- **P400:002** *Run* (DI1) and **P400:008** *Run Forward CW* (DI3), the setpoint will be 20 Hz.
- **P400:002** *Run* (DI1), **P400:008** *Run Forward CW* (DI3) and **P400:019** *Active preset* (DI5), the setpoint will become 40 Hz.

For further information see chapter "**4.7 Function assignment of the inputs and outputs (default setting)**" of Sinus S Programming Manual **15R0132B100**.

3.2. Brake energy management

When braking electrical motors, the kinetic energy of the drive train is fed back regeneratively to the DC bus. This energy causes a DC-bus voltage boost. If the energy fed back is too high, the inverter reports an error. To avoid DC-bus overvoltage, it is possible to use a braking resistor.
The menu " Overview\Additional functions\ Brake energy management" allows to set *Brake resistor [0]* in *Operating Mode* (**P706:001**). In this way, the kinetic energy of crane will be dissipated on the resistor protecting the drive.

3.3. Holding brake control

The holding brake can be automatically released via the start command for the inverter or manually via an external control signal.
In "Overview\Additional functions\Holding brake control", select *Brake mode* (**P712:001**) as Automatically, then select (**P420:001**) *Relay* as *Release holding brake [115];* in this way the output relay is automatically programmed to open the holding brake.

At this point, it is possible to set opening time (**P712:003** = **0x2820:003**) and closing time (**P712:002** = **0x2820:002**). As shown in picture, they are the delay time to open or close the brake.
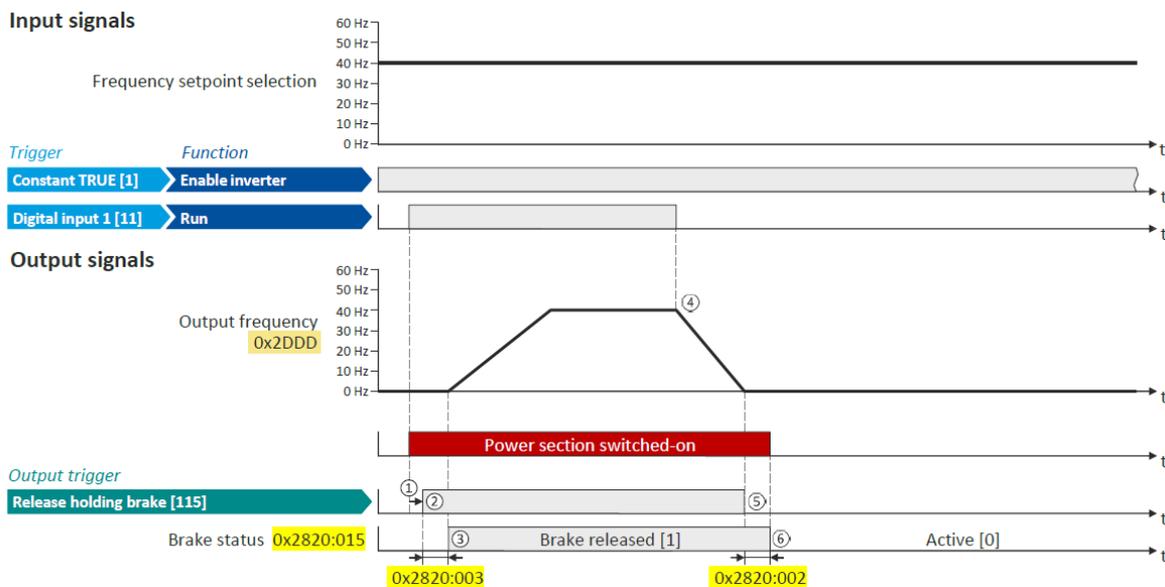
3.4. Anti-sway
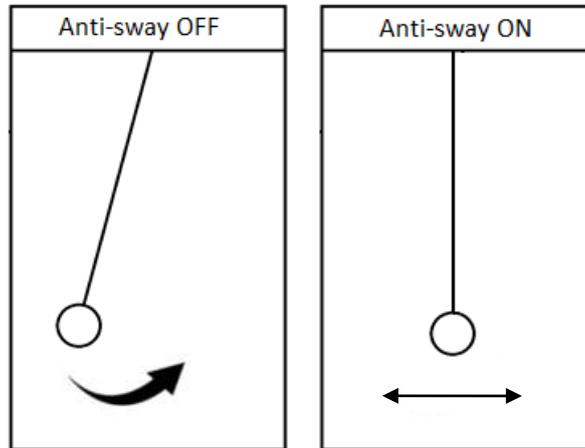
This optional function allows suppressing overhead load swaying from applications such as bridge cranes.
A fully open-loop algorithm is used, which does not require any additional sensors or boards.
The drive changes the speed reference to suppress swaying.

The Anti-sway function is activated through parameter **P799:01** (Anti-sway control: Activation).
Parameter **P799:02** (Anti-sway control: Rope Length) allows setting the maximum rope length in meters. It is important to set the maximum rope length achieved during operations.
Additional settings can be made through parameter **P799:03** (Anti-sway control: Friction Coefficient).

For optimum performance, make sure that all S-Ramp are disabled when using the Anti-sway function. See parameter 0x291E:001 (**P226.01**).