

# **Description of SAR Control**

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# Preface

The system is split into two parts. The Radar (ST200), which also can be used as a stand-alone device and the Axis itself. This documentation is primary focussing on the Axis.

# Overview

## Axis

The axis is 2.50 m long. Two tripods are holding the whole axis. A belt is fixed on the left and right end of the axis. On both side of the axis are small ramps. This ramps are used for the hardware limit switches. They prevent the drivetrain drive into the end of the axis. A second ramp

## Drivetrain

The drivetrain uses the belt for positioning. Inside is a step motor. The moving part, the drivetrain, is connected to the PLC with a cable carrier.

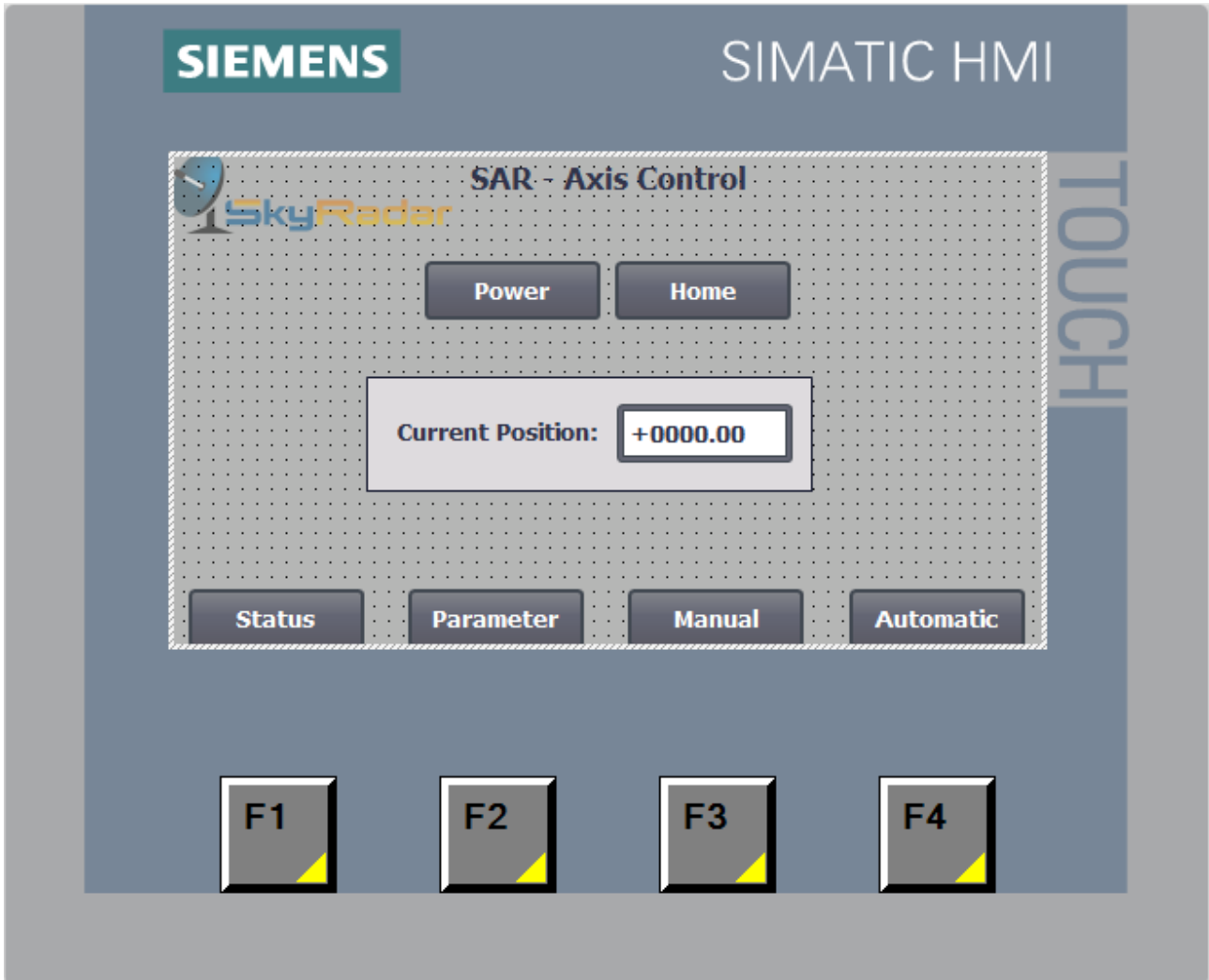
## Electrical cabinet

Under the axis is the electrical cabinet. A power supply (24V), a PLC and a touch panel is integrated. On the left side of the electrical cabinet is one connector for power and one sub-d 15 pin female connector.

# Touch panel

To control and visualize the axis, a Touch panel has been integrated.

## Main Screen



## Usage

After the power has been connected and the switch is in on position, the PLC and touch panel is starting up. When the main screen is visible, you're able to control the axis. The first step is the initialisation. The axis doesn't know its position.

### To initialise do following:

1. Press in the button 'Power'. The bottom changes the color from red into green. This enables the stepper motor. Now the drivetrain is fixed in its position.
2. Press the button 'Home' one time. The drivetrain drives slowly in the left direction until it hits the reference position on the axis. You'll see a negative position during this step. This is normal during reference position operation. After the ramp has been reached, the position will be set to 0.0 mm.
3. The PLC controller knows then in which position the drivetrain is.

To enter the the other different screens, press the buttons below. The software buttons and also the hardware buttons do have the same functionality.

## Status

In the status screen you'll see the state of the hardware limit switches S2 and S3. S1 is the switch for the reference position. Also the current position is visible in this screen. The buttons on the right side have following functionality:

### Reset

This button will reset the step chain from automatic mode and also resets the step drive.

### Power

Power activates and deactivates the step drive. When the step drive is deactivated, the color is red. Then you're able to shift the drivetrain by hand. To active the step drive, press the button again. Then the color changes from red to green.

### Home

When the Home position is already set and you press this button again, the color changes from green to grey. Press the button a second time and the drivetrain is driving slowly to the left direction until the reference switch has been reached. Then the reference of the axis is initialised.

## Status Screen

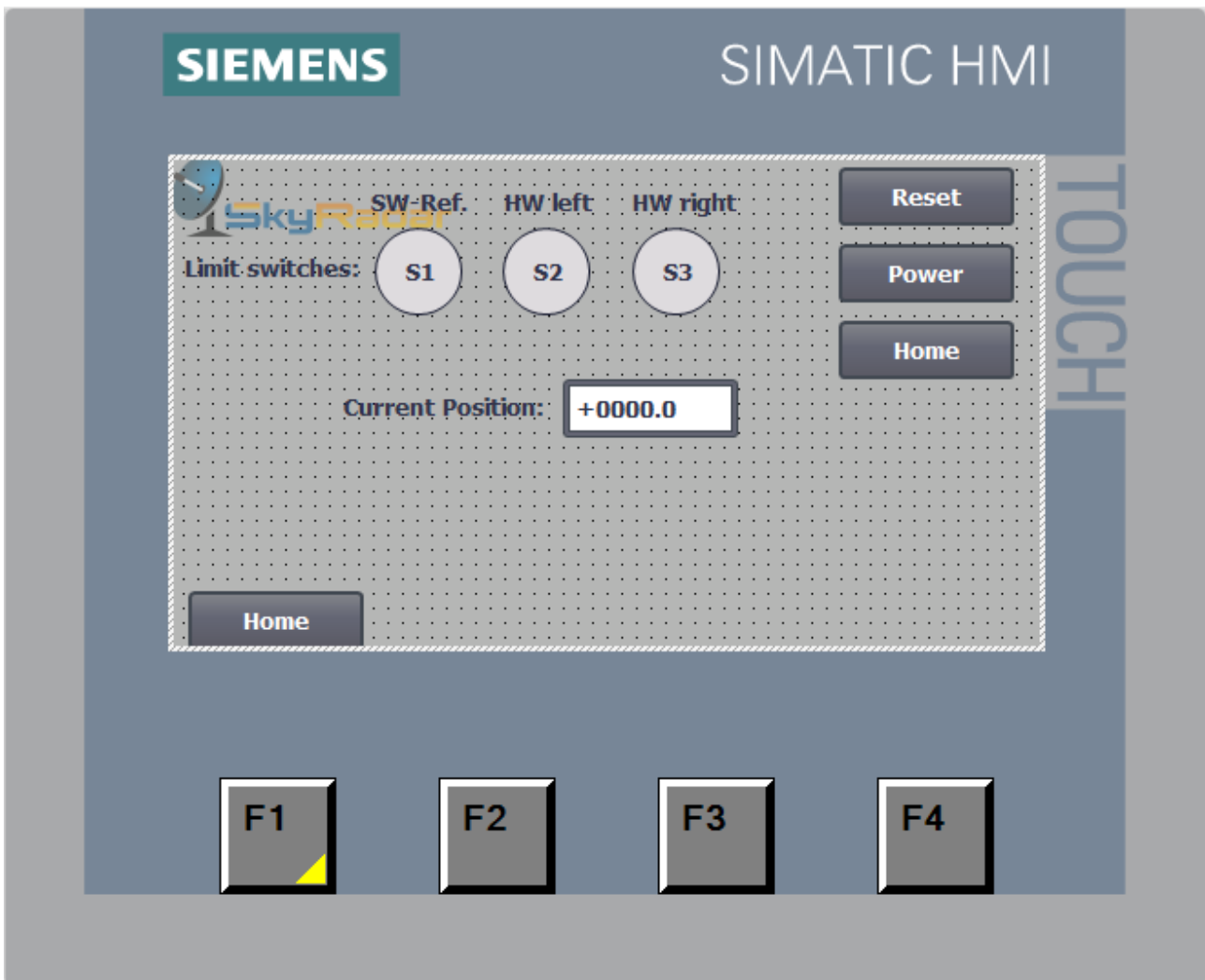
The status screen shows the state of the reference and limit switches. The S1 is used for software reference. S2 and S3 shows the state of the hardware limit switches. The hardware limit switches prevents the drivetrain drive into the end of the axis. The reference switch is used, to find the zero position.

Reset  
Power

Resets the step chain and errors of the axis.  
Activates the step drive. The state is shown as color. Green is active. Red is inactive. When the step drive is inactive, you can move the drivetrain by hand.

Home

Drive to the reference switch to find the zero position.

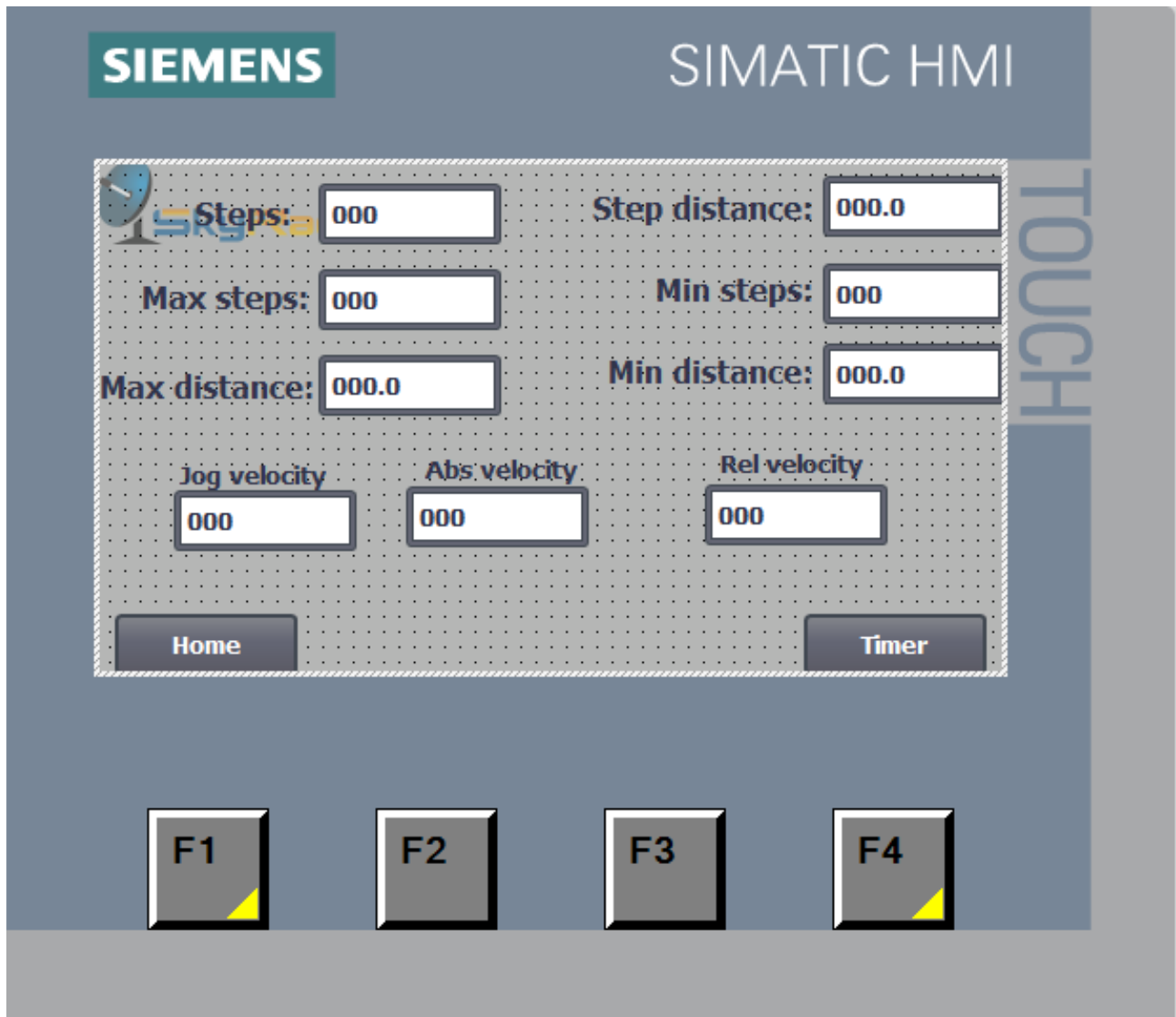


# Parameter Screen

Important parameters can be set in the parameters screen:

Steps	Number of steps in automatic mode
Step distance	The distance in mm between two steps.
Max steps	Maximum number of possible steps.
Min steps	Minimum number of possible steps.
Max distance	Maximum distance between two steps.
Min distance	Minimum distance between two steps.
Jog velocity	The velocity in Jog-Mode
Abs velocity	The velocity in absolute movement
Rel velocity	The velocity in relative movement.

The amount of steps and the step distance can also be set in the automatic screen. The other variables are only accessible in the parameter screen.

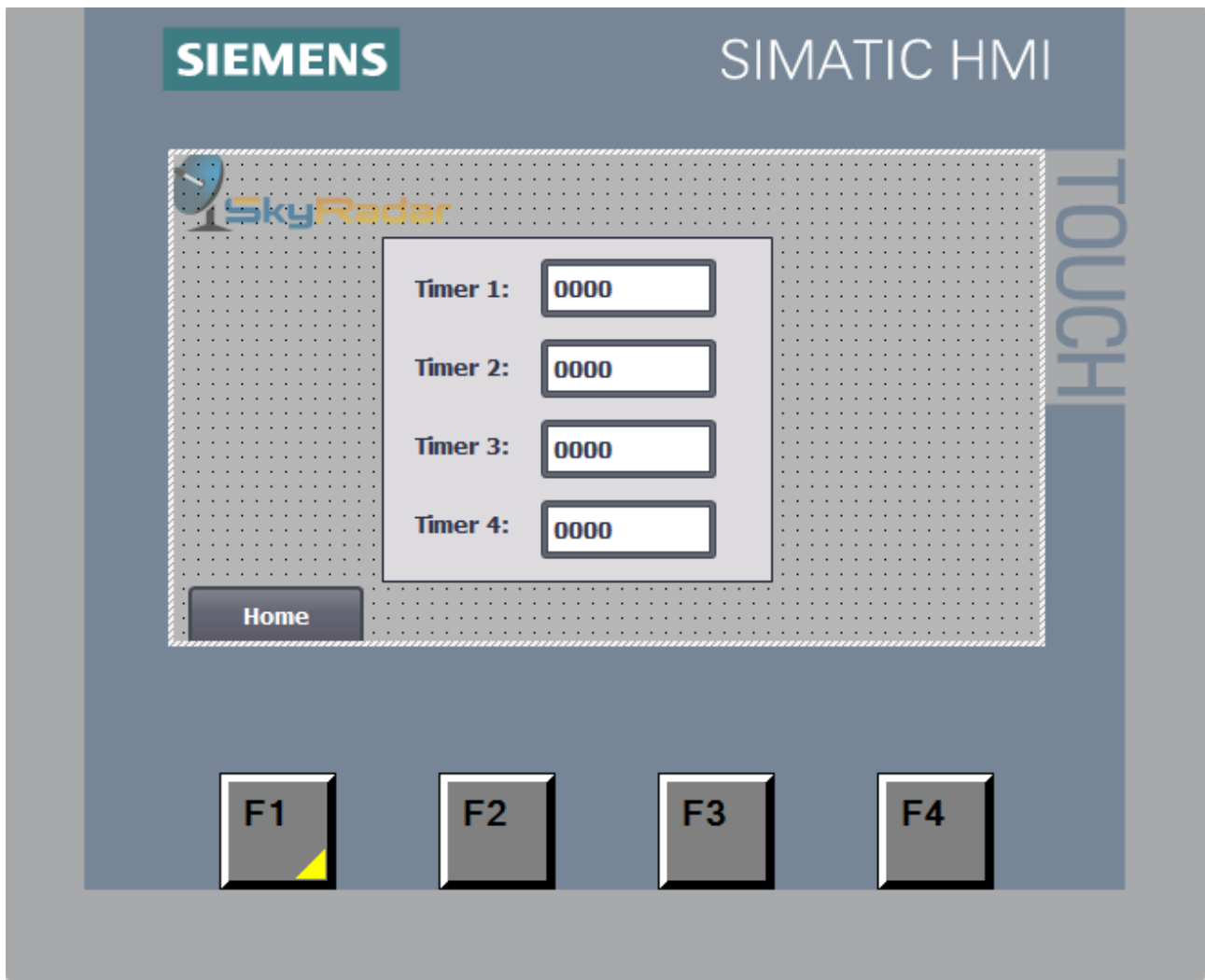




# Time Screen

Timer 1  
Timer 2  
Timer 3  
Timer 4

Duration of the signal: Capture  
Time after the signal: Capture.  
Duration of the signal: Select next frame  
Time after the signal: Select next frame



## Manual Screen

In the screen manual, the drivetrain can be driven manual. There are three modes:

### Move Rel.

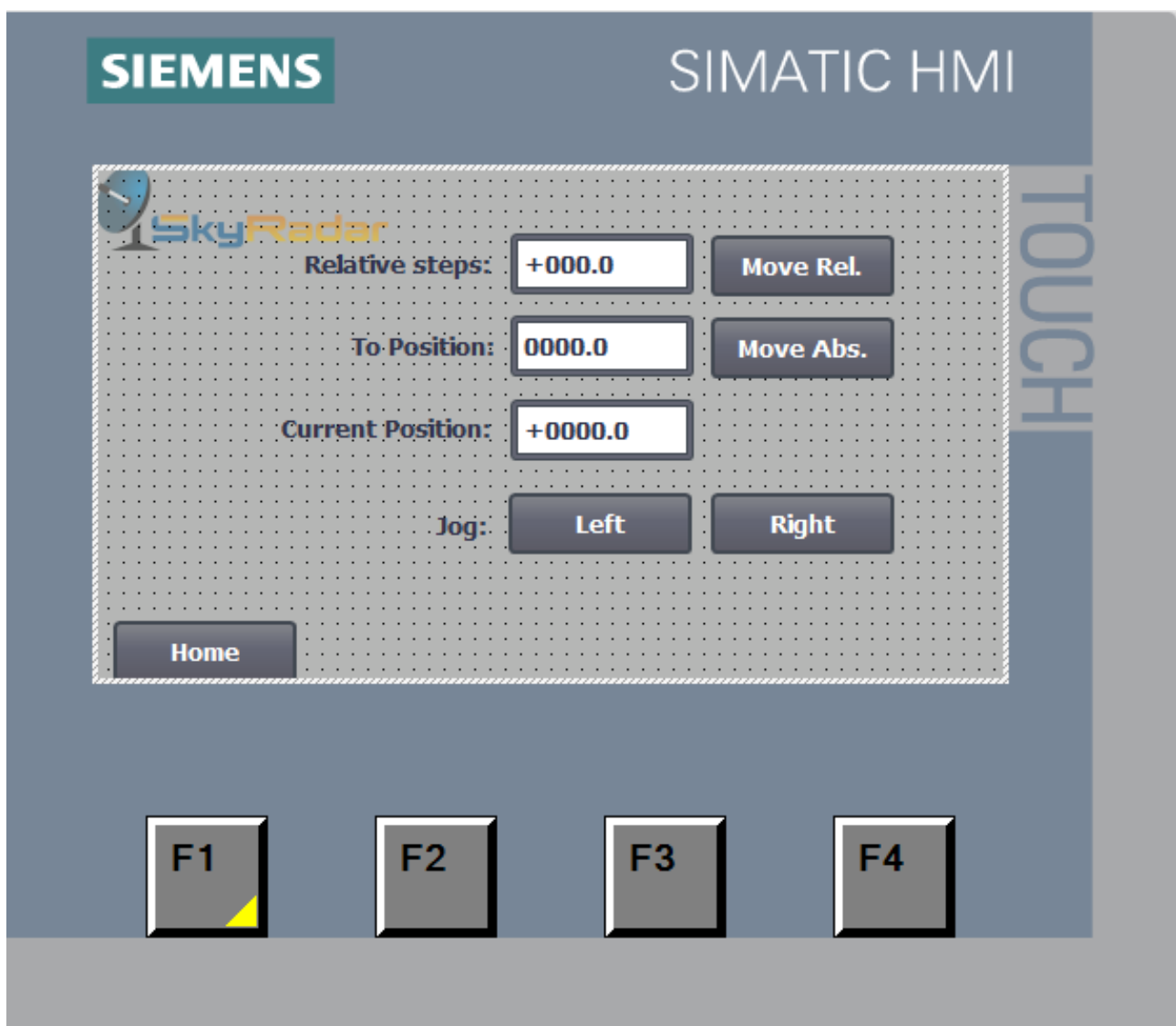
Move the drivetrain relative. A positive value in 'Relative steps' drives the drivetrain in working direction (left to right). A negative value drives the drivetrain into negative direction. Pressing the button 'Move Rel.' executes the action.

### Move Abs.

In absolute movement the drivetrain drives to the preset position of the field 'To Position'. The direction depends if the position is after or behind the drivetrain. The button 'Move Abs.' executes the action.

### Jog-Mode

In Jog-Mode the drivetrain drives in the direction Left or Right as long as the button is pressed.



When a limit has been reached or a position is not reachable, the color of the bottom changes into red color. Then the function is locked, until the condition is fulfilled.

## Automatic Screen

To start the capturing with the Radar, following conditions must be fulfilled:

- The USB cable must be connected to the Laptop.
- The SAR software must be opened.
- The reference must be set one time.


An internal helper function is calculating steps  $\leftrightarrow$  distance. When you enter the number of steps, the step distance is being calculated automatically. The calculation is based on the usable axis length (2 meters). You can also enter the step distance. In this case, the steps will be calculated automatically.

The values of snapshots sets the number of snapshots. The value in steps does not affect the number of snapshots.

To start the operation, press the button start. The drivetrain is starting the operation from the current position. After all snapshots are take, the drivetrain drives back to the start position. When you start the drivetrain for example from the middle of the axis, the drivetrain drives after the snapshots back to the old start position.

**SIEMENS**

SIMATIC HMI



Steps:

Step distance:

Snapshots:

Current Snapshot No.:

TOUCH

