SIEMENS

SINAMICS

Intelligent Operator Panel

Intelligent commissioning and application configuration tool

Operating Instructions

Edition 02/2016

SIEMENS

SINAMICS

Intelligent Operator Panel (IOP)

Operating Instructions

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Edition 02/2016, Firmware IOP V1.6.2

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Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠DANGER
indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠WARNING
indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠CAUTION
indicates that minor personal injury can result if proper precautions are not taken.

NOTICE
indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠WARNING
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Fundamental safety instructions

1

1.1 General safety instructions

⚠ WARNING

Danger to life if the safety instructions and residual risks are not observed

If the safety instructions and residual risks in the associated hardware documentation are not observed, accidents involving severe injuries or death can occur.

- Observe the safety instructions given in the hardware documentation.
- Consider the residual risks for the risk evaluation.

⚠ WARNING

Danger to life or malfunctions of the machine as a result of incorrect or changed parameterization

As a result of incorrect or changed parameterization, machines can malfunction, which in turn can lead to injuries or death.

- Protect the parameterization (parameter assignments) against unauthorized access.
- Respond to possible malfunctions by applying suitable measures (e.g. EMERGENCY STOP or EMERGENCY OFF).

1.2 Industrial security

Note

Industrial security

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, solutions, machines, equipment and/or networks. They are important components in a holistic industrial security concept. With this in mind, Siemens' products and solutions undergo continuous development. Siemens recommends strongly that you regularly check for product updates.

For the secure operation of Siemens products and solutions, it is necessary to take suitable preventive action (e.g. cell protection concept) and integrate each component into a holistic, state-of-the-art industrial security concept. Third-party products that may be in use should also be considered. For more information about industrial security, visit this address (http://www.siemens.com/industrialsecurity).

To stay informed about product updates as they occur, sign up for a product-specific newsletter. For more information, visit this address (http://support.automation.siemens.com).

⚠ WARNING

Danger as a result of unsafe operating states resulting from software manipulation

Software manipulation (e.g. by viruses, Trojan horses, malware, worms) can cause unsafe operating states to develop in your installation which can result in death, severe injuries and/or material damage.

- Keep the software up to date.

  You will find relevant information and newsletters at this address (http://support.automation.siemens.com).
- Incorporate the automation and drive components into a holistic, state-of-the-art industrial security concept for the installation or machine.

  You will find further information at this address (http://www.siemens.com/industrialsecurity).
- Make sure that you include all installed products into the holistic industrial security concept.

⚠ WARNING

Danger to life due to software manipulation when using exchangeable storage media

Storing files onto exchangeable storage media amounts to an increased risk of infection, e.g. with viruses and malware. As a result of incorrect parameterization, machines can malfunction, which in turn can lead to injuries or death.

- Protect files stored on exchangeable storage media from malicious software by taking suitable protection measures, e.g. virus scanners.

Safety notes

2

Warnings and cautions

⚠ DANGER

Ensuring a safe and stable state

During commissioning of the Inverter it is essential to ensure that the system is in a safe and stable state, as some commissioning processes have the potential to start the motor. Therefore it is important to secure any loads and ensure that should the motor start, no potentially dangerous conditions exist.

Note

- The IOP can be fitted to and removed from the inverter while power is applied.
- The IOP will set the USS PZD (P2012) length to 4 when connected to the inverter.

Overview

3

3.1 Introduction

Compatibility

The Intelligent Operator Panel (IOP) has been designed to enhance the interface and communications capabilities of SINAMICS Inverters.

The IOP connects to the Inverter through an RS232 interface. It has been designed to automatically recognize the following devices from the SINAMICS range:

- SINAMICS G120 CU230P-2
- SINAMICS G120 CU240B-2
- SINAMICS G120 CU240E-2
- SINAMICS G120 CU250S-2
- SINAMICS G120C
- SINAMICS G120D-2 CU240D-2*
- SINAMICS G120D-2 CU250D-2*
- SINAMICS ET 200pro FC-2*
- SINAMICS G110D*
- SINAMICS G110M*
- SINAMICS S110 CU305*

*Denotes Control Units that require the IOP Hand-Held Kit to connect the IOP to the Control Unit.

Hand-Held Kit order number: 6SL3255-0AA00-4HA0.
Optical cable order number: 3RK1922-2BP00 (not required for the SINAMICS S110 CU305)

For information on firmware and language upgrades, please see IOP Updater (Page 23).

Note

IOP functional support

- Drives with SINAMICS firmware prior to version 4.2 may not be fully supported by the IOP.
- The actual menu structure and functionality of the IOP will be influenced by the following factors:
  - The software version and type of Control Unit to which the IOP is fitted.
  - The firmware and software version of the IOP.
  - The selected functional group filtering of the parameters.

3.2 Layout and functions

Overview

The physical layout of the IOP is shown below:

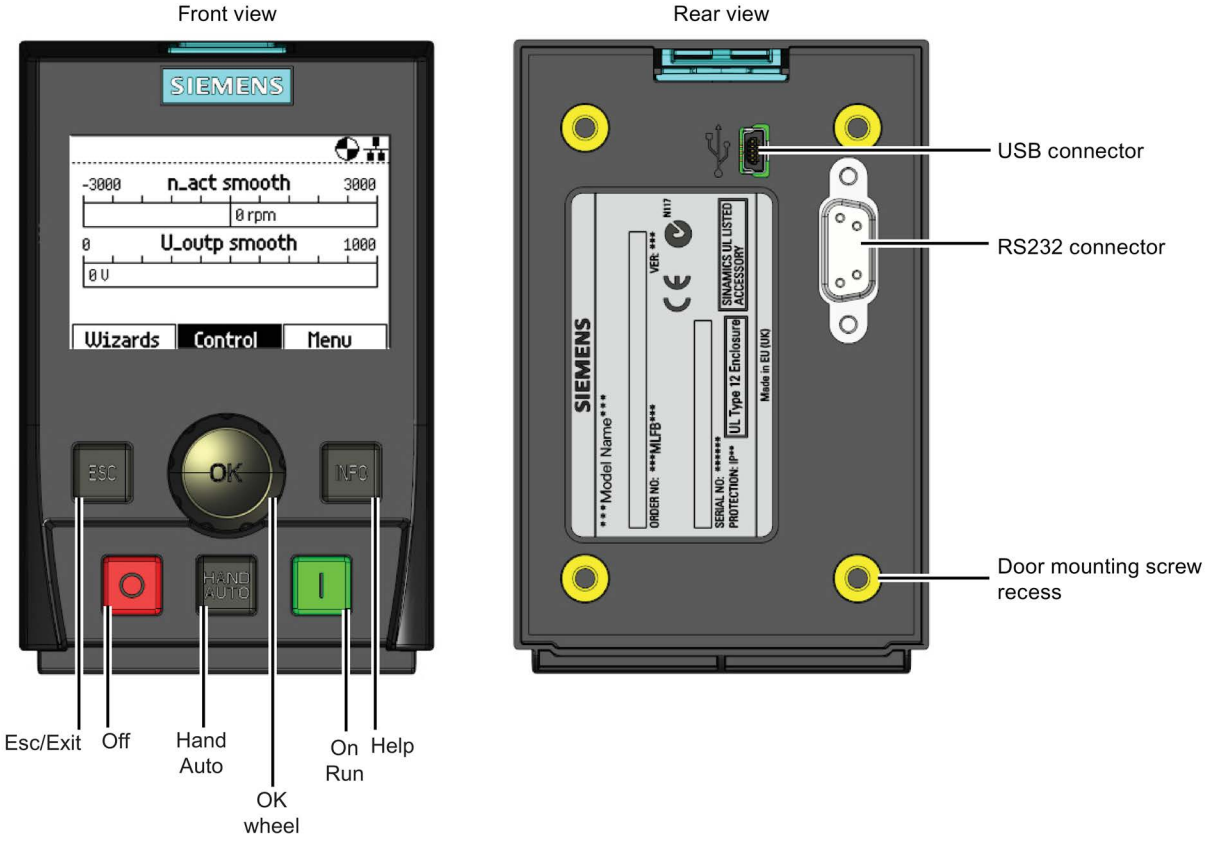
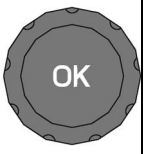


Image 3-1 Layout of IOP

The IOP is operated by using a push-wheel and five additional buttons. The specific functions of the push-wheel and buttons are shown in the table below.

Table 3- 1 Function of the IOP controls

Key	Function
	The push-wheel has the following functions: • In a menu, turning the push-wheel changes the selection. • When a selection is highlighted, pressing the push-wheel confirms the selection. • When editing a parameter, turning the push-wheel changes the displayed value; clockwise increases the value and anti-clockwise decreases the displayed value. • When editing parameter or search values there is a choice to edit individual digits or an entire value. With a long press of the push-wheel (>3 sec) it will toggle between the two different value editing modes.
	The ON key has the following functions: • In AUTO mode, the screens displays an information screen, stating that the command sources is AUTO and can be changed by pressing the HAND/AUTO KEY. • In HAND mode the converter is started - the converter status icon starts turning. Notes: For Control Units with firmware versions less than 4.0: When running in AUTO mode, HAND mode cannot be selected unless the converter is stopped. For Control Units with firmware versions 4.0 or greater: When running in AUTO mode, HAND mode can be selected and the motor will continue to run at the last selected setpoint speed. When the converter is running in HAND mode, the motor stops when switched to AUTO.
	The OFF key has the following functions: • If pressed for longer than 3 seconds the converter will perform an OFF2; the motor will then coast down to a standstill. Note: 2 presses of the OFF key within 3 seconds will also perform and OFF2. • If pressed for less than 3 seconds the following actions will be performed: – If in AUTO mode the screen will display an information screen stating that the command sources is AUTO and can be changed using the HAND/AUTO key. The converter will not be stopped. – If in HAND mode the converter will perform an OFF1; the motor will come to a standstill in the ramp-down time set in parameter P1121.
	The ESC key has the following functions: • If pressed for less than 3 seconds the IOP returns to the previous screen or if a value has been edited, the new value is not saved. • If pressed longer than 3 seconds the IOP returns to the status screen. When using the ESC key in the parameter editing mode, no data is saved unless the OK key is pressed first.
	The INFO key has the following functions: • Displays additional information for the currently selected item. • Pressing the INFO key again will display the previous screen. • Pressing the INFO key during power-up of the IOP will place the IOP in DEMO mode. To exit DEMO mode, power-cycle the IOP.
	The HAND/AUTO key switches the command source between HAND and AUTO mode. • HAND sets the command source to the IOP. • AUTO sets the command source to an external source, for example, fieldbus.

Changes in functionality of the IOP keys

The functionality of the individual controls of the IOP is changed when the following functions are activated, the user should be aware of these changes of functions to ensure that the IOP operates in the intended manner.

- Custom Hand mode Custom Hand mode (Page 33)
- Startup in Hand mode Startup in Hand mode (Page 35)
- Hand/Auto disable Hand/Auto disable (Page 36)

Locking and unlocking the keypad

The keypad can only be locked once the power-up cycle has been completed. If the keys are actived before the power-up cycle is completed, the IOP will enter the DEMO mode.

To lock the IOP keypad press **ESC** and **INFO** simultaneously for 3 seconds or more. To unlock the keypad press **ESC** and **INFO** simultaneously for 3 seconds or more.

DEMO mode

DEMO mode allows the IOP to be used for demonstration purposes without affecting the converter to which it is connected. Menus can be navigated and functions selected, but all communications with the converter are blocked to ensure that the converter does not react to any commands issued from the IOP.

To enter the DEMO mode it is necessary to do a long press of the ESC key or INFO key during the power-up cycle. The IOP must be power cycled again to exit the DEMO mode.

3.3 Screen icons

Overview

The IOP displays a number of icons at the top right-hand edge of the display to indicate various states or current conditions of the converter. These icons are explained in the table below.

Table 3- 2 Screen icons

Function	Icon	Remarks
Command source		Auto - the converter receives the command signals from the network controller
	JOG	Displayed when the JOG function is active
		Hand - the converter is under control of the IOP
Inverter status		
		Icon rotates when the motor is running
Fault pending		
Alarm pending		
Saving to RAM		Indicates that all recent changes to parameters have been saved in RAM only. In the event of a power failure, then all recent changes saved to RAM will be lost. To prevent loss of parameter data a RAM-to-ROM save must be performed.
PID autotuning		
Hibernation mode		
Write Protection		Parameters cannot be modified.
Know How Protection		Parameters cannot be viewed or modified.
ESM		Essential Services Mode
Battery condition		The battery status is only shown when the IOP Hand-held kit is used.

3.4 Menu structure

Overview

The IOP is menu structure is shown below. For information on the IOP compatibility, see Introduction (Page 11):

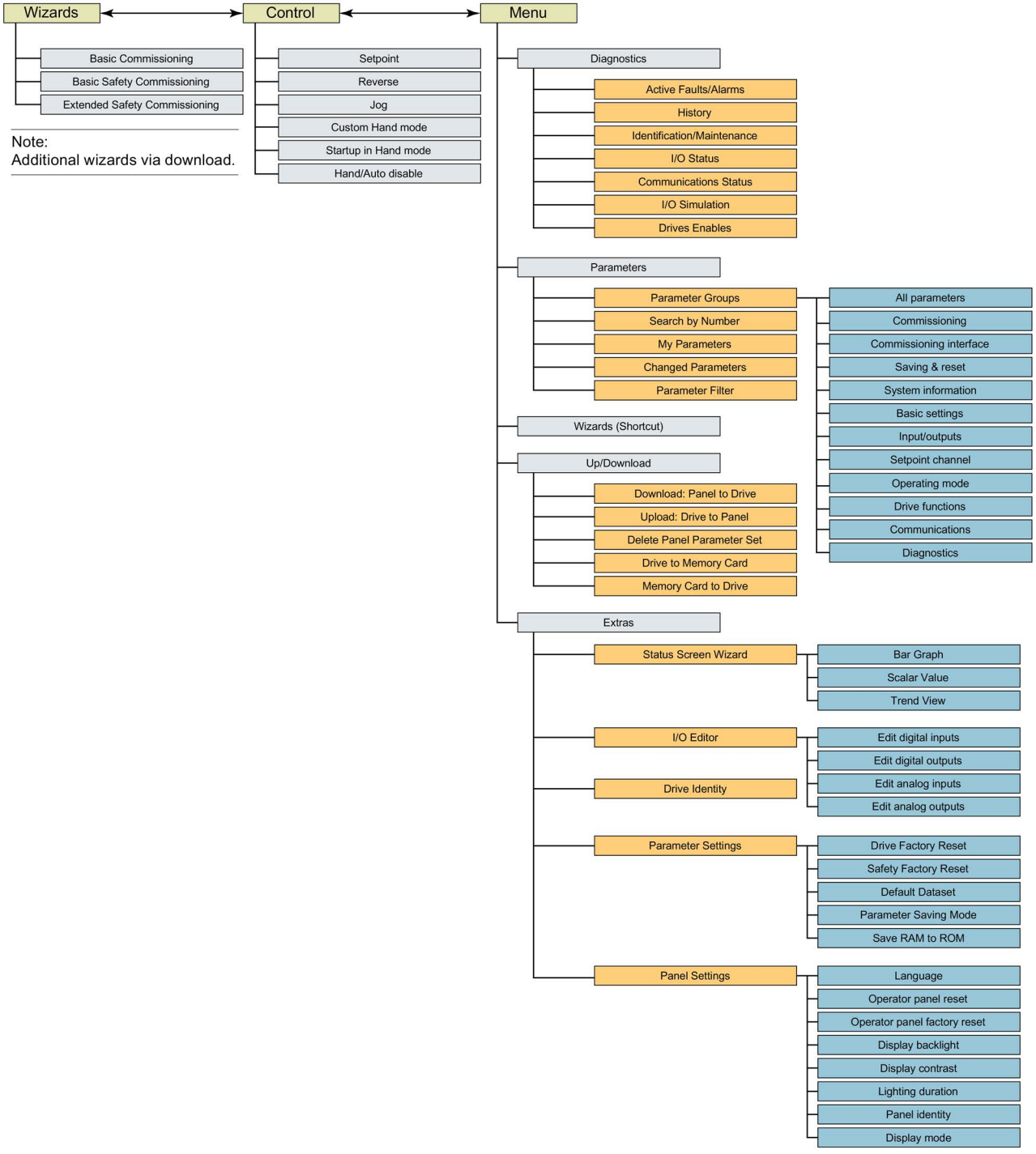


Image 3-2 IOP menu structure

Installation

4

4.1 Fitting the IOP

Fitting the IOP to the Control Unit

Note

IOP power supply

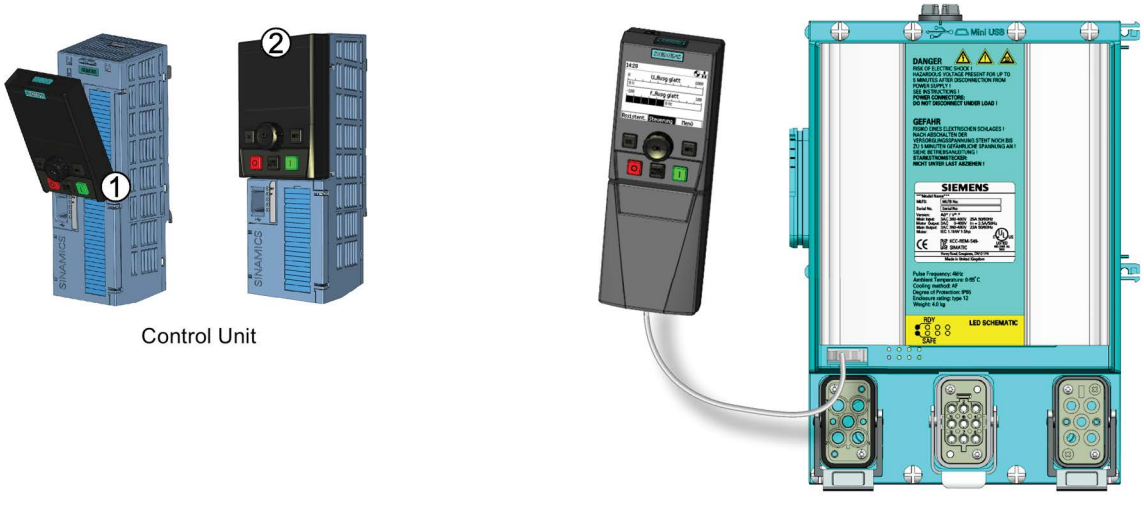
The IOP has no internal power supply and derives its power directly from the Control Unit of the converter through the RS232 interface. The IOP can also be connected to a PC and derives its power through the USB connection.

To fit the IOP to the converter Control Unit the following procedure should be performed:

1. Place the bottom edge of the IOP casing into the lower recess of the Control Unit housing.
2. Push the IOP forward until the top fastening clicks into place on the Control Unit housing.

To use the IOP with a decentralized drive, for example an ET200pro FC-2, an IOP Handheld kit is required and an optical cable. The IOP Handheld kit and optical cable are fitted as shown in the following figure.

The order details of both the IOP Handheld kit and the optical cable are given in the Introduction (Page 11).



Control Unit

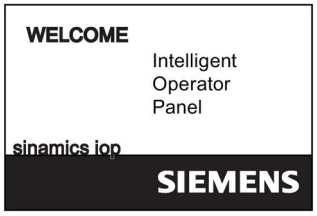
IOP Handheld Kit and ET200pro FC-2

Image 4-1 Fitting IOP on CU and ET200pro

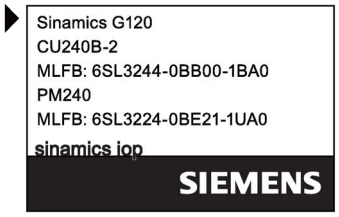
4.2 Initial Set-up

Initial set-up sequence

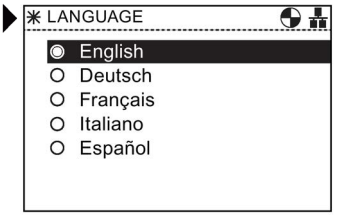
Once the IOP is fitted and powered-up it will automatically detect the type of Control Unit and Power Module to which it has been fitted. On first-time use, the IOP automatically displays the option to select the default language and allow the time and date to be set (if the Control Unit to which the IOP is fitted has a real-time clock). The procedure is outlined below.



Splash screen is displayed

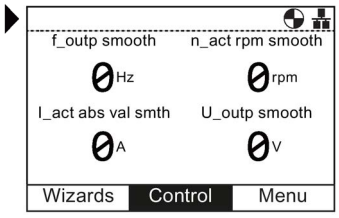


The CU information is displayed



Select the required language

Select the required wizard or press ESC



The Status screen is displayed

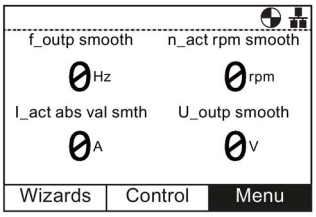
Note

The IOP is delivered with only the Basic Commissioning wizards. All other wizards can be downloaded using the IOP updater tool. For futher information, please see IOP Updater (Page 23).

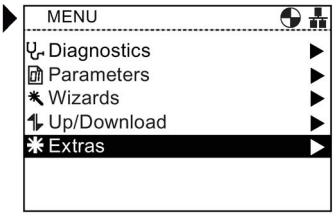
The status screen can be reconfigured to show a number of different views and types of values; these can be configured using the "Status Screen Wizard" in the "Extras" menu, see Extras (Page 49).

Language selection

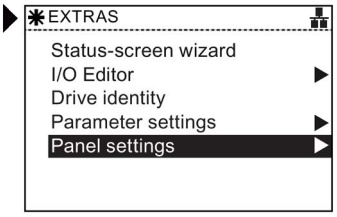
To select the language that the IOP should display, the following actions should be performed:



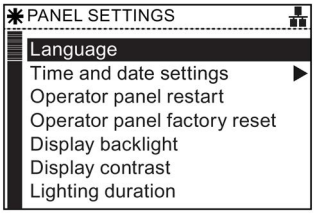
Select Menu



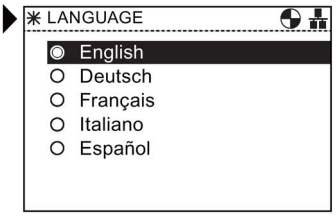
Select Extras



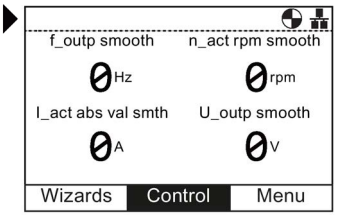
Select Panel settings



Select language



Select required language

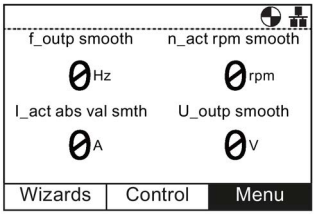


Press and hold down ESC for Status Screen

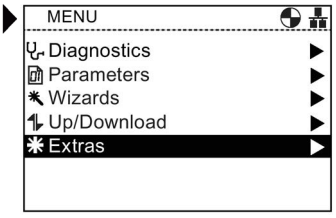
Additonal languages are available for the IOP. For further information, please see IOP Updater (Page 23).

Setting time and date

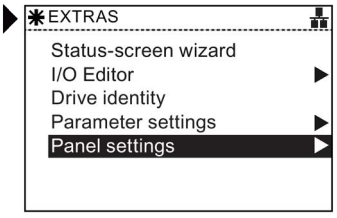
When the IOP is first fitted to a Control Unit, which has a real-time clock, it will automatically display the time and date screen, the following actions should be performed:



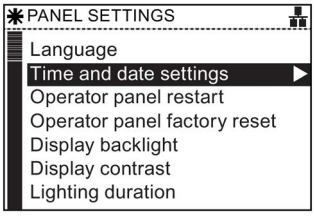
Select Menu



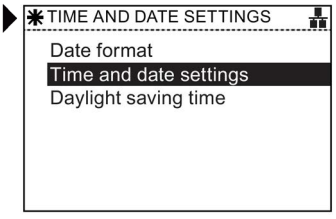
Select Extras



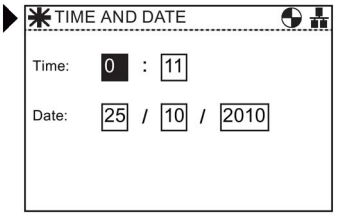
Select Panel settings



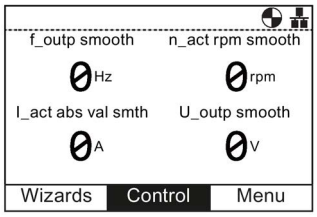
Select Time and date settings



Set the Time and date settings



Set time and date

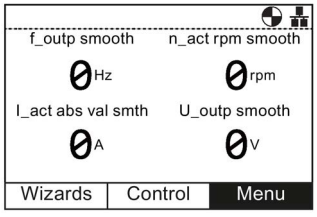


Press and hold down ESC for Status Screen

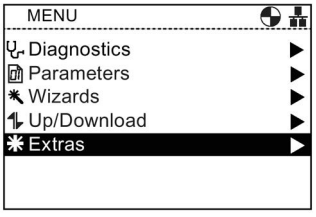
The settings for time are normally done on the Control Unit if it has a Real-time Clock (RTC). If the Inverter has an RTC the IOP will take its settings from the Control Unit.

Lighting duration

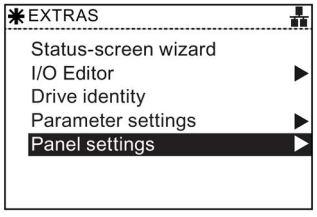
To set the length of time that the display remains lit, the following actions should be performed:



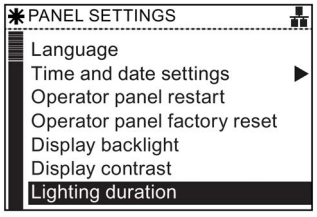
Select Menu



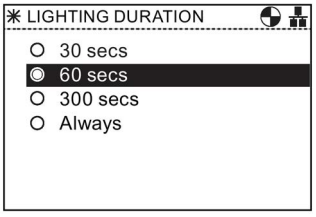
Select Extras



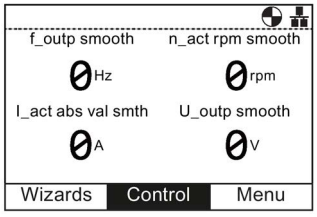
Select Panel settings



Select Lighting duration



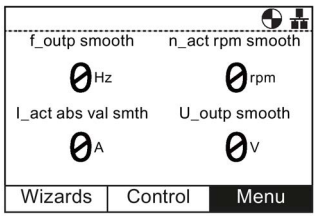
Select Lighting duration time



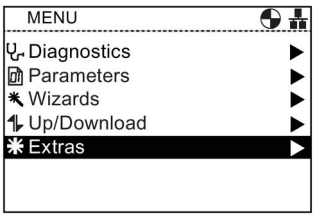
Press and hold down ESC for Status Screen

Display contrast

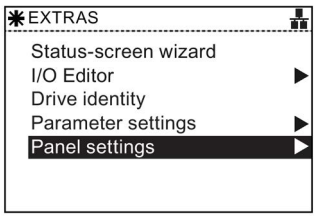
To set the contrast level of the IOP, the following actions should be performed:



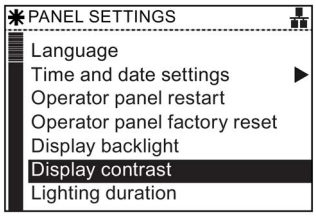
Select Menu



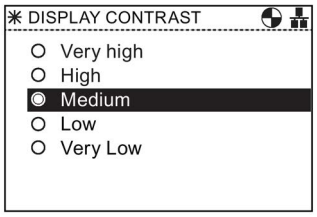
Select Extras



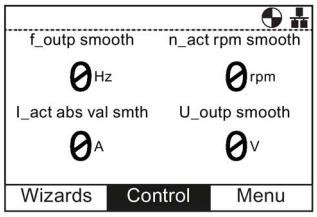
Select Panel settings



Select Display contrast



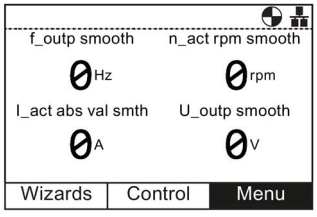
Select Display contrast setting



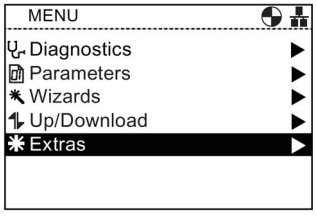
Press and hold down ESC for Status Screen

Display backlight

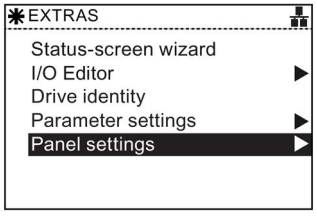
To change the intensity of the backlight, the following actions should be performed:



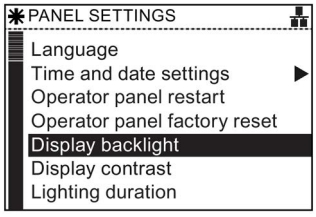
Select Menu



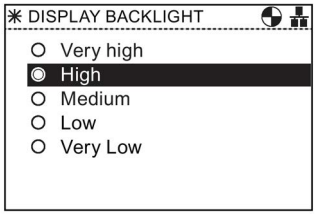
Select Extras



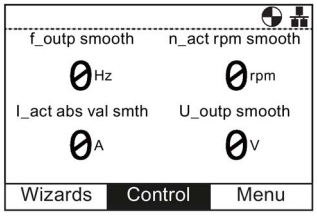
Select Panel settings



Select Display backlight



Select display backlight level

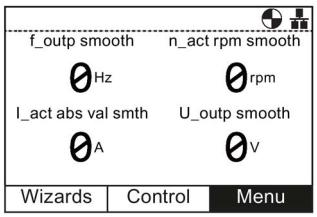


Press and hold down ESC for Status Screen

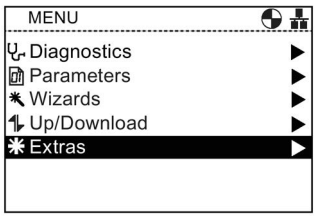
The display backlight setting will be automatically changed to the "Low" setting after 60 seconds from the last key press to extend the life of the display. When any key is pressed the backlight setting will automatically return to the user setting.

Display mode

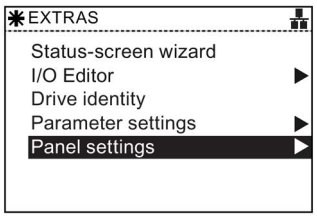
To change the display mode, the following actions should be performed:



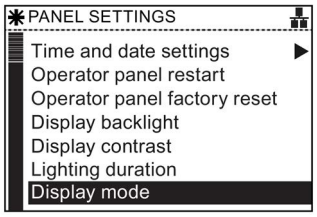
Select Menu



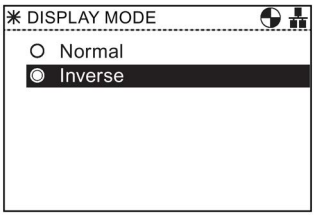
Select Extras



Select Panel settings



Select Display mode



Select display mode type

The IOP will perform an automatic restart

4.3 User definable labels for the Status screen

User definable labels

User defined labels allow the user to customize the labels that appear on the status screen of the IOP.

There are a maximum of four labels that can be defined and they are located on the IOP in the "cps" folder. The IOP must be connected to the PC via the USB connection and in "Mass Storage" mode to access the files on the IOP.The files are basic text files and can be opened with any basic text editor. The default label names are "default", when the labels have the "default" text, the IOP will ignore the labels. There are the following restrictions when creating your own labels:

- A maximum of 20 characters for each label name.
- The characters that can be used conform to the normal windows file naming conventions.
- The number of labels are restriction depending on the type of status screen view that is selected in the "Status screen wizard". see Extras (Page 49).

The four files are named:

- BotLeft.txt
- BotRight.txt
- TopLeft.txt
- TopRight.txt

The file names relate to the area of the status where they will appear.

Simply selected the file you wish to use as a label; open it with a text editor, change the name and then save it back to the same location in the IOP file system. If the file name itself is change the IOP will not recognize the label.

An example of the status screen with new label names (using the *BotLeft.txt* and *TopLeft.txt* files) is shown in the figure below.

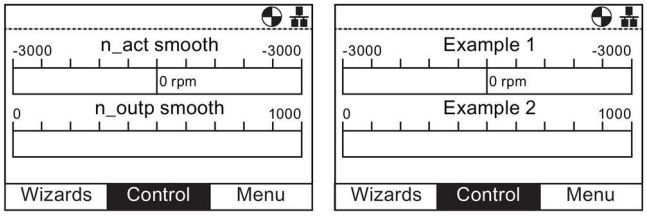


Image 4-2 User definable labels example

4.4 IOP Updater

Overview

The IOP Updater tool allows the user to download:

- Additional language packs
- Firmware updates
- Additional wizards
- Application wizards

Note

English language is mandatory

The English language file is essential to the correct functioning of the IOP and therefore cannot be deleted. All other available languages can be downloaded to the IOP or deleted as necessary.

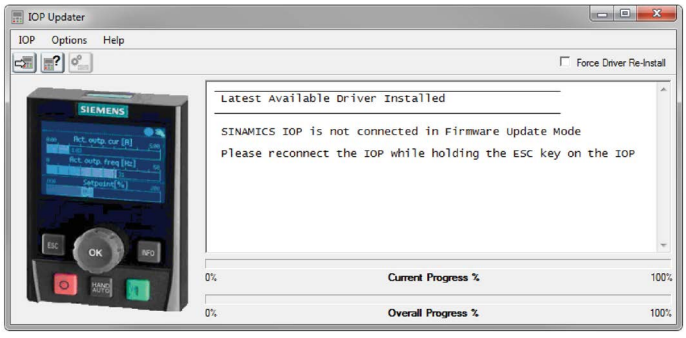


Image 4-3 IOP Updater

The IOP Updater software, additional wizards, firmware files and languages files can be downloaded from the Siemens Service and Support website at the following link:

IOP Updater download (http://support.automation.siemens.com/WW/view/en/67273266)

The website contains getting started files which explain the installation and use of the IOP Updater software.

Wizards

5

Overview

The IOP wizards are question-driven macros that assist the user to set-up various functions and applications of the Inverter.

⚠WARNING

Motor Identification (Motor ID) function will run automatically

Using the "Standard Drive Control" or "Dynamic Drive Control" basic commissioning, the Motor ID function, by default, is activated at the end of the commissioning wizard.

The motor identification (motor ID) function, after basic commissioning, upon the first pprox. 8 to 30 s) will automatically accelerate the motor to the setpoint speed, .

The action must be taken into account when basic commissioning has been completed to ensure that the first power ON command when given for your application, does not produce an unpredicted or unsafe effect on personnel, equipment or premises.

⚠WARNING

Safe and stable state of the Inverter

During commissioning of the Inverter it is essential to ensure that the system is in a safe and stable state, as some commissioning processes have the potential to start the motor. Therefore it is important to secure any loads and ensure that should the motor start, no potentially dangerous conditions exist.

⚠CAUTION

Default datasets

The wizards use the default Drive datasets (DDS0 and CDS0), if the default datasets are changed to the other datasets, the wizards may not function correctly.

Note

Default wizard and downloading

The IOP is delivered with only the Basic Commissioning Wizard installed. If the CU has safety functions, the Basic Safety Commissioning Wizard will also be available.

All other wizard can be downloaded using the IOP updater tool.

IOP Updater download (http://support.automation.siemens.com/WW/view/en/67273266)

5.1 Example wizard

Overview of wizards

The following example of how wizards work on the IOP are purely for demonstration purpose only.

⚠CAUTION

Before commissioning an application

Prior to using the a wizard, it is essential that the user's Control Unit and Power Module have been installed and wired correctly, in accordance with the requirements of the user's application. This is extremely important in the case of commissioning safety-integrated applications. All inputs and outputs must be defined and configured before any commissioning can take place, including the observation and adherence of all local, national and international safety regulations required for the user's application and all devices utilized by the user's application.

Basic commissioning wizards

The basic commissioning wizards all the user needs to commission the converter in both standard and safety modes. If the converter is a safety variant both wizards will be presented in the wizards menu by default. All other wizards can be downloaded using the IOP updater tool.

The basic commissioning wizard presents three levels of commissioning, as follows:

- **Expert Mode** - this mode presents the user with a detailed list of all relevant parameters that require to be configured.
- **Standard Drive Control** - this mode presents the user with the necessary input screens for standard applications.
- **Dynamic Drive Control** - this mode presents the user with the necessary input screens for more complex applications.

The Standard Drive Control and Dynamic Drive Control are specifically designed to work with the PM240, PM240-2, PM330 Power Modules and the SINAMICS G120C converter.

Note

Macro source selection

During the basic commissioning process, the user will be presented with a list of preset macros that determine the configuration of converter. Every Control Unit Operating Instructions contain a list of the macros that are specific for that particular Control Unit and show the wiring configurations for each macro. For further information, see the relevant Operating Instructions.

IOP Wizards Manual

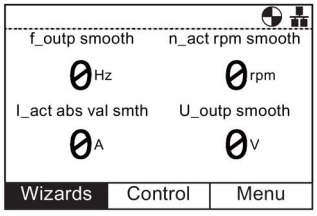
The wiring diagrams and additional information for the configuration of the drives when using the IOP Wizard is given in the IOP Wizard Manual.

This manual is available for download at the following link:

IOP Wizard Manual (https://support.industry.siemens.com/cs/de/en/view/109483443)

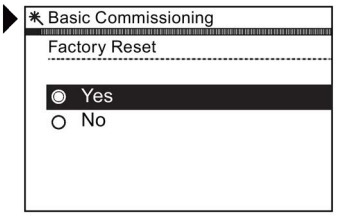
5.1.1 Basic commissioning with IOP

Basic commissioning wizard

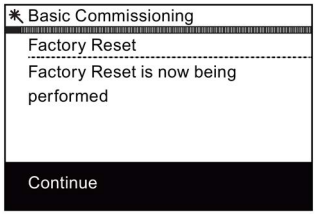


Select Wizards

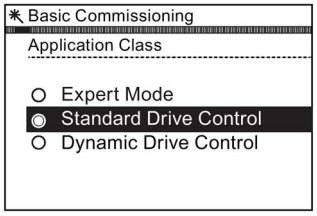
Select required Commissioning wizard



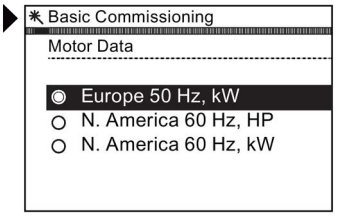
Select Factory Reset (yes or no)



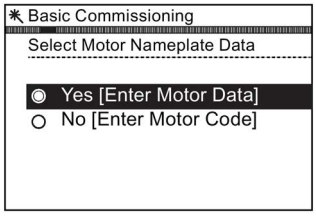
Select Continue



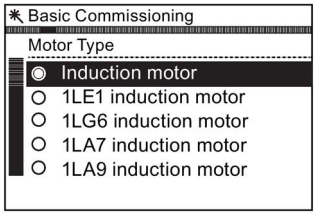
Select Application Class



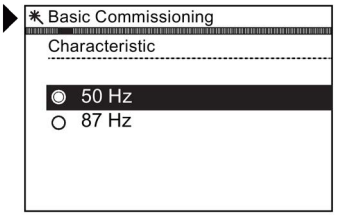
Select Motor Data



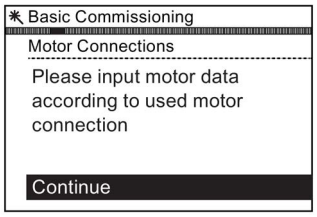
Select Enter Motor Data



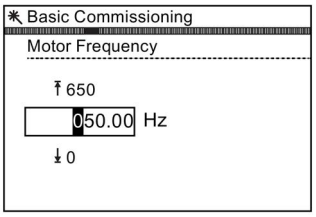
Select Motor Type



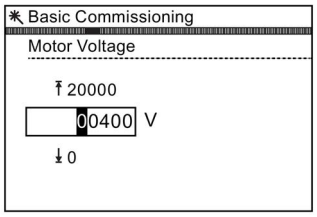
Select Characteristic



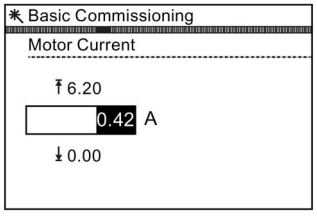
Select Continue



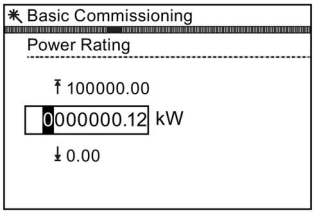
Input Motor Frequency



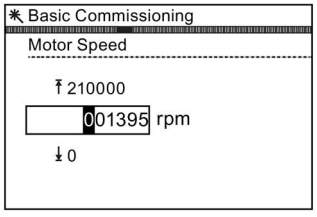
Input Motor Voltage



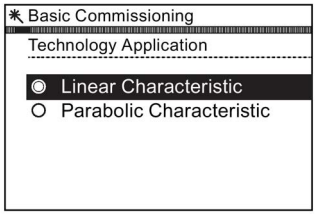
Input Motor Current



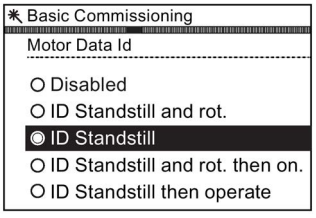
Input Power Rating



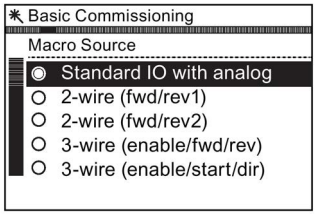
Input Motor Speed



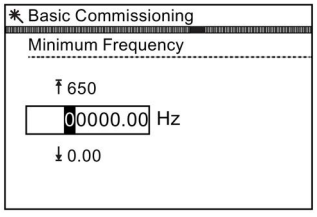
Select Technology Application



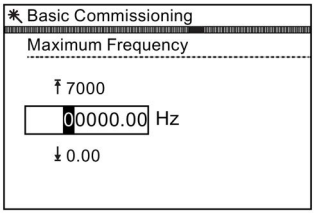
Select required Motor Data ID function



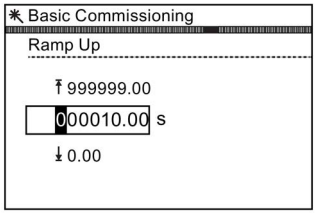
Select Macro Source



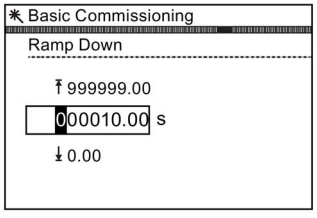
Input the Minimum Frequency



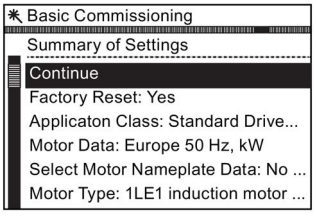
Input Maximum Frequency



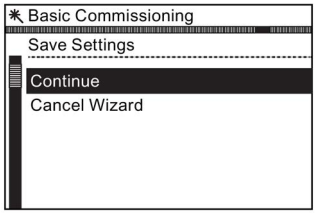
Input Ramp-up time



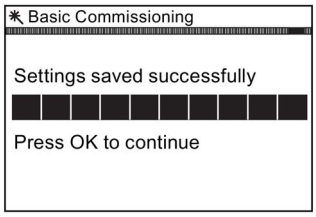
Input Ramp-down time



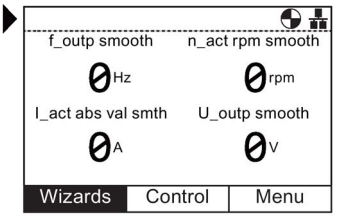
Summary of Settings - Select Continue



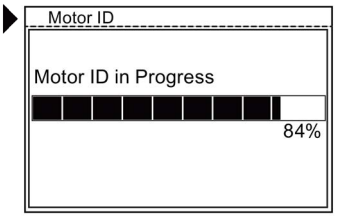
Save Settings



Settings saved



Status Screen displayed



On first ON command - Motor ID is performed

Control

6

Overview

The Control menu allows the user to change the following settings in real-time:

- Setpoint
- Reverse
- Jog
- Custom Hand mode
- Startup in Hand mode
- Hand/Auto disable

The control menu is accessed from the menu at the bottom-centre of the Status screen, as shown below.

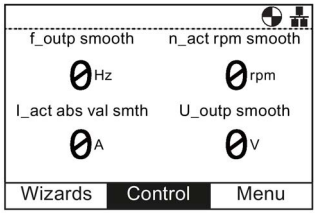


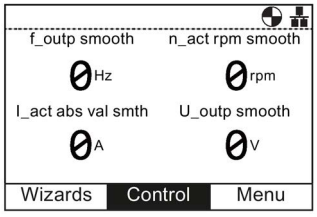
Image 6-1 Status screen with the Control Menu highlighted

6.1 Setpoint

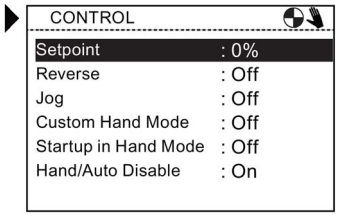
Setpoint

The setpoint value determines the speed at which the motor runs as a percentage of its full range of motion.

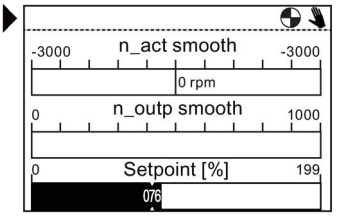
To change the setpoint, the following actions should be performed:



Select Control



Select Setpoint



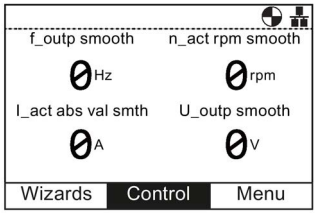
Rotate wheel to set the Setpoint

6.2 Reverse

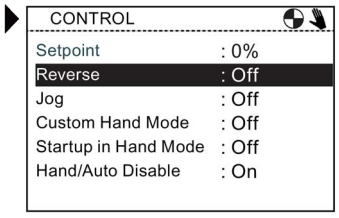
Reverse

The function of the reverse command is to set the direction of rotation of the motor from its normal forward motion.

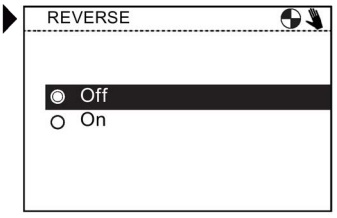
To reverse the direction of the motor, the following actions should be performed:



Select Control



Select Reverse



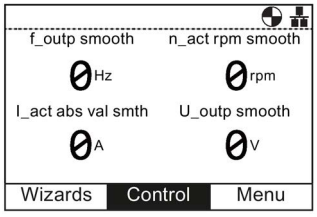
Select Off or On

6.3 Jog

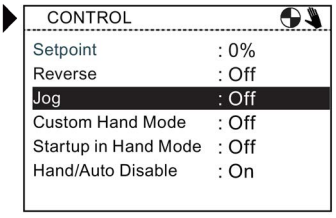
Jog

The Jog function, when selected will allow the motor to be manually rotated by a pre-determined value with each press of . If is pressed continuously, the motor will rotate continuously until is released.

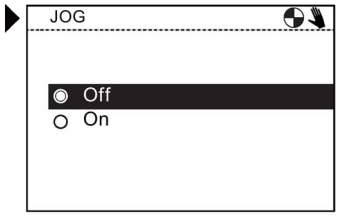
To enable or disable the Jog function, the following actions should be performed:



Select Control



Select Jog



Select Off or On

Note

Selection of Jog frequencies

It is important that the Jog parameters P1058 (Jog right) and P1059 (Jog left) are set to the required frequencies for the users application. The default jogging setpoint for both parameters is 5 Hz (150 rpm).

When the Jog left and Jog right (Jog1 and Jog 2) have been set; it is necessary to do a long press of the "INFO" key to select the other jog mode.

6.4 Custom Hand mode

Overview

The custom hand mode allows the user to setup a command source and setpoint source directly from the Intelligent Operator Panel (IOP).

When the custom hand mode has been set, the IOP wheel can be used as the setpoint source.

The Auto mode is unaffected by any changes made by the custom hand mode function.

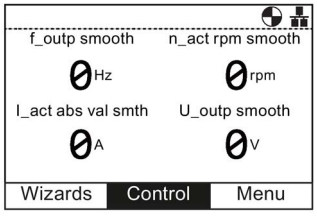
A breakdown of all the interconnection inputs are given in the table below.

An example of setting up the custom hand mode is given in the instructions below.

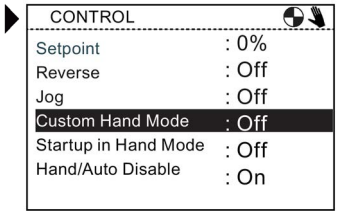
Table 6- 1 Interconnection inputs for Status Word 1 in Custom Hand mode

Standard interconnection				
r8540	**STW 1 from IOP**	**Binector Inputs (BI)**	**p8542**	**Effective STW1 in Custom Hand mode**
Bit0	ON/OFF key	->	Bit0	ON/OFF1
Bit1	Two quick press of the OFF key	->	Bit1	OFF2
Bit2	A long press of the OFF key	->	Bit2	OFF3
Bit3	Reserved	->	Bit3	Inhibit/enable operation
Bit4	Reserved	->	Bit4	Ramp-function generator enable
Bit5	Reserved	->	Bit5	Continue ramp-function generator
Bit6	Reserved	->	Bit6	Setpoint enable
Bit7	Alarms menu acknowledge all faults	->	Bit7	Acknowledge faults
Bit8	Jog 1 (Control menu)	->	Bit8	Jog 1
Bit9	Jog 2 (Control menu)	->	Bit9	Jog 2
Bit10	Reserved	->	Bit10	Control by PLC
Bit11	Change direction (Control menu)	->	Bit11	Direction of rotating - reversed
Bit12	Reserved	->	Bit12	Speed control enable
Bit13	Reserved	->	Bit13	Motorized potentiometer, setpoint, increase
Bit14	Reserved	->	Bit14	Motorized potentiometer, setpoint, decrease
Bit15	Reserved	->	Bit15	CDS selection
Standard interconnection				
r8541	**Speed setpoint from IOP**	**Connector Inputs (CI)**	**p8543**	**Effective speed setpoint in Custom Hand mode**
	N_soll OP	->		Speed setpoint

Setting up Custom Hand mode example

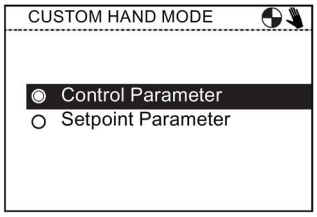


Select Control

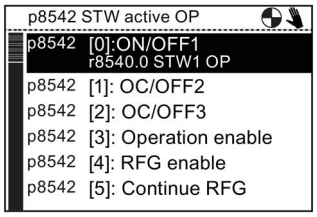


Select Custom Hand Mode

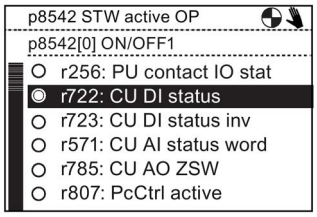
Select Custom Hand Mode On



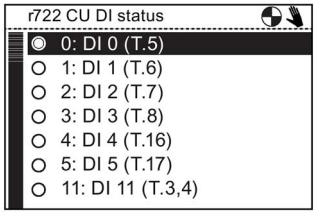
Select Control Parameter



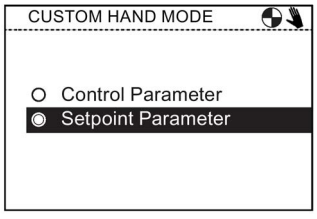
Select required function



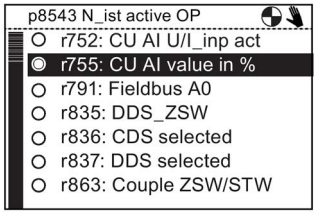
Select source of command signal



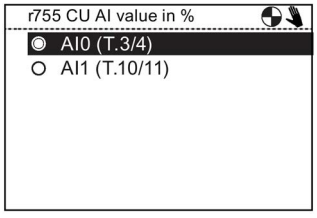
Select the input that will receive command signal



Select Setpoint Parameter



Select the setpoint signal source



Select the input to receive the setpoint signal

Once the setpoint signal input has been selected, the IOP will return to the Setpoint selection screen then press ESC for >3 secs, to return to the status screen.

In this example, the converter is now setup to receive the ON/OFF1 command from Digital Input 0 (DI0) and the speed setpoint from Analog Input 0 (AI0), from the controlling PLC.

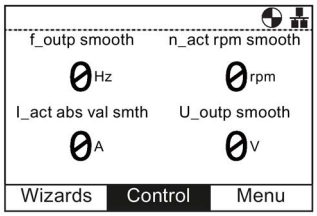
6.5 Startup in Hand mode

Overview

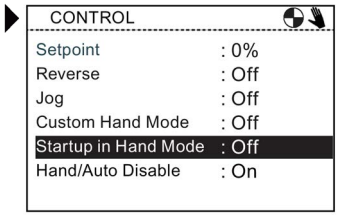
Startup in Hand mode allows the converter, under the control of the Intelligent Operator Panel (IOP), to startup in Hand mode automatically. The command source is then taken from the off and on buttons of the IOP.

An example of setting up the Startup in Hand mode is given in the instructions below.

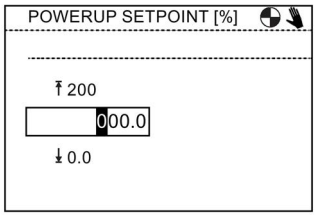
Setting up Startup in Hand mode example



Select Control



Select Startup in Hand Mode



Set the required speed set-point as a percentage value

The IOP will automatically return to the Control menu and show that "**Startup in Hand Mode**" is "**On**".

The converter, after a power-cycle will automatically startup in Hand mode, but the attached motor will not run until the run command is given by the buttons on the IOP.

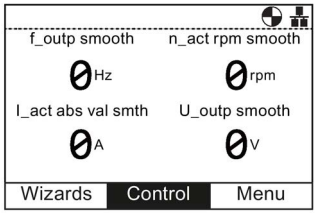
6.6 Hand/Auto disable

Overview

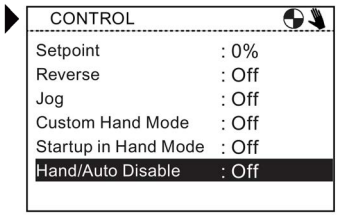
The Hand/Auto disable function disables the HAND/AUTO key on the Intelligent Operator Panel (IOP) and pressing the key will not produce any action by the IOP.

An example of setting up the Startup in Hand mode is given in the instructions below.

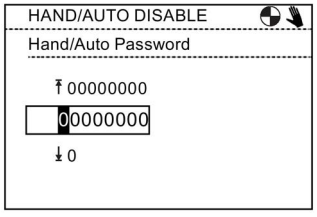
Setting up the Hand/Auto disable function



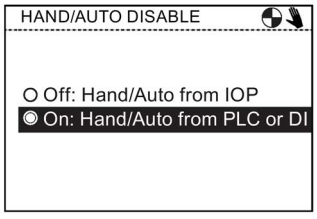
Select Control



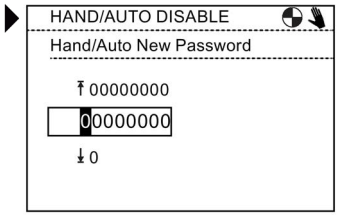
Select Hand/Auto Disable



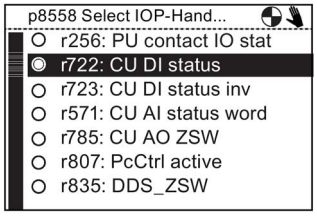
Enter password (default: 00000000)



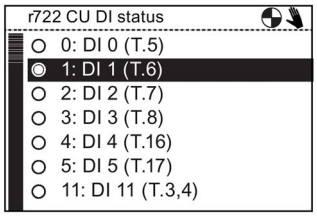
Select On: Hand/Auto from PLC or DI



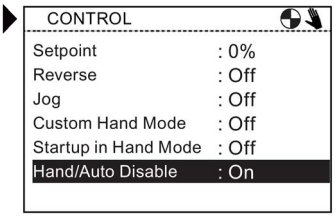
Enter password again or create a new password



Select signal source



Select input to receive control signal



Press ESC to return to Control Menu

The HAND/AUTO button is now disabled and local control of the IOP cannot be activated by the HAND/AUTO button.

Note

Power-cycle required to complete the HAND/AUTO disable function

When the HAND/AUTO disable function is initiated the function will not become active until a power-cycle of the IOP has been performed. When the HAND/AUTO disable function is turned off, again, a power-cycle of the IOP is required to complete the deactivation of the function.

Menu 7

7.1 Overview

Overview

The "Menu" is selected from the three menu options at the bottom of the IOP screen.

When the "Menu" option is selected the following functions are displayed:

- Diagnostics
- Parameters
- Wizards (this is a shortcut to the main Wizards menu)
- Up/Download
- Extras

By rotating the Wheel the required function can be highlighted. Pushing the Wheel confirms the selection and further sub-menus will be displayed. Pressing ESC once will return the IOP to the previous screen, a longer press will return the display to the "Status" screen.

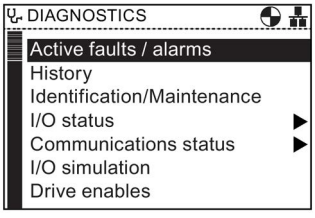
For information on the IOP compatibility, see Introduction (Page 11).

7.2 Diagnostics

Diagnostics menu

When the diagnostic function is selected the following options are presented:

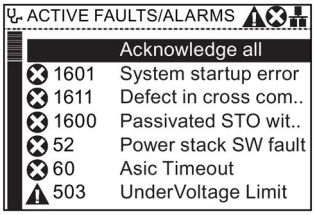
- Active faults/alarms
- History
- Identification/Maintenance
- I/O status
- Communications status
- I/O simulation
- Drive enables



Active faults/alarms

When this option is selected the screen will display any active faults and alarms that have not yet been acknowledged.

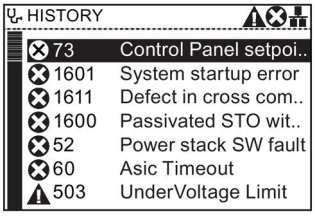
Each fault and alarm can be selected and by pressing the INFO key or the OK key, an explanation of the fault or alarm will be displayed.



History

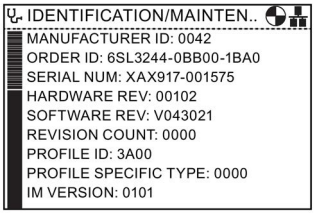
When this option is selected the screen will display a list of all previous faults and alarms with the time that they occurred.

Each fault and alarm can be selected and by pressing the INFO key or the OK key, an explanation of the fault or alarm will be displayed.



Identification/Maintenance

Displays specific technical information regarding the Control Unit and Power Module to which the IOP is attached will be displayed. The actual information displayed depends on the type of Control Unit and Power Module to which the IOP is connected.



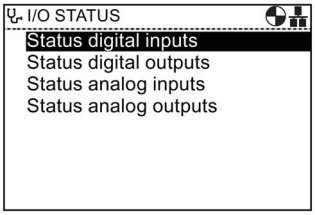
I/O status

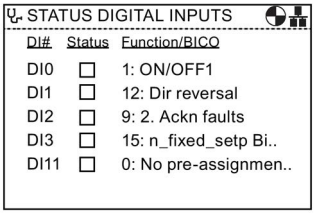
This option displays a list of the digital and analog inputs and outputs of the Inverter and their current status.

This is an information screen and cannot be changed.

Pressing ESC will return the display to the previous menu.

In the example shown opposite, the status of the digital inputs are displayed.

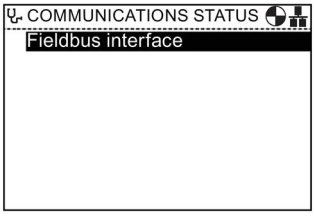


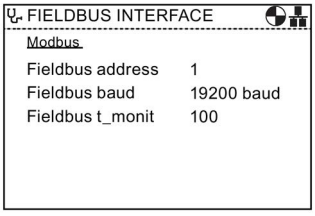


Communications status

The option displays the status of the fieldbus interface and the details of the settings for the data exchange, for example status words and control word lengths.

In the example shown opposite, the status of the fieldbus communications is shown.





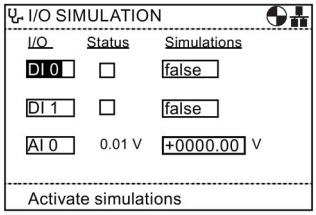
I/O simulation

⚠ WARNING

Loss of control of the Inverter

If the Inverter is started using the I/O simulation and the IOP is removed from the Inverter it will not be possible to stop the Inverter running the motor. If the I/O simulation is activated, then only the I/O simulation can be used to stop the Inverter.

The IOP simulation screen allows digital and analog IOs to be simulated without the requirement for external signals. These features are of great benefit during commissioning and fault finding, as the user can quickly simulate a situation without using wires, tools and external equipment.



For example:

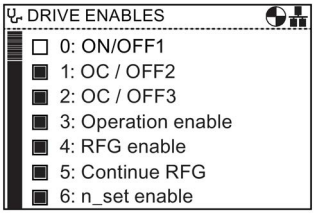
- A digital input can be made high without any wires in the terminals.
- An analog input or output can be driven to any value without any wires in the terminals.
- A digital output can be overridden and made high.

The screen presents the following options:

- I/O - Three I/Os can be simulated - two digital and one analog.
- Status - this indicates the real-time status of the input or output. If the square is shaded then the input or output signal is present. This is a read-only section of the screen.
- Control - this column of the screen displays the present status of the input or output and can be altered.

Drive enables

The drive enables screen displays a list of all the current enabling signals for the Inverter. If the enable signal is present and active it will be selected ▣. If the enable signal is not present and is not active it will be unselected □.



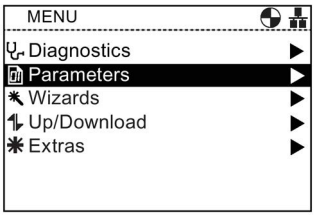
This screen is read-only and is for information purposes only.

7.3 Parameters

Parameter menu

For information on IOP compatibility, see Introduction (Page 11).

The parameter menu allows the user extensive functionality and access to all the Inverter parameters. When this option is selected the user is given the opportunity to perform parameter orientated functions grouped in the following manner:



- Parameter groups
- Search by number
- My parameters
- Changed parameters

Note

SINAMICS S Drive Objects

The SINAMICS S range of Inverters deal with each component of the Inverter system as unique and separate entities, these unique entities are called "drive objects" (DO). When selecting "Parameters" from the Menu, there is an additional screen that requires the selection of the relevant DO before any parameters can be accessed. The default drive object is always Servo (DO2). If you wish to access the parameter relating to the Control Unit, the select "Control Unit (DO1)". See screenshot below.

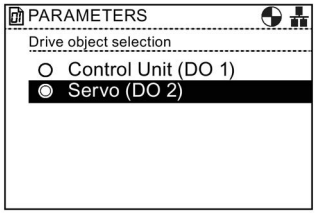


Image 7-1 Parameters - Drive Object Selection

Parameter groups

All parameters

This options allows the user access to the individual parameters of the Inverter. The default filter is "Standard" which allows the user access to the most frequently used parameters. The default filter settings can be changed by selecting "Parameter filter" from the "Parameter settings" option in the "Extras Menu".

Commissioning

This screen displays a complete listing of all the parameters required for quick commissioning. The parameters are listed in numerical order and can be accessed to either

confirm the set values or modified should there be a need to fine tune the application or correct any errors in the parameter values.

Commissioning interface

Selects the storage medium for access via the USB mass storage.

Saving & reset

This option allows the user access to all the parameters regarding the saving and reset functions of the Inverter. Each parameter displays is currently set value and these can be modified if required.

System information

This screen displays all the parameters that contain system information regarding the Inverter. The majority of these parameters are read-only and are for information purposes only.

Basic settings

Displays the effective Drive Data Set (DDS). Each basic setting can be selected and modified if necessary.

Inputs/outputs

This option allows access to all the available parameters to configure the digital and analog I/Os.

The user can navigate through the various inputs and outputs to see the current configuration of the inputs and outputs and, if necessary access the parameters directly to modify their values. In the example screen opposite, the parameters for the digital inputs is shown.

Setpoint channels

This option allows the user to display and modify the setpoint parameters.

Operating mode

This option allows the user to display and modify the operating mode parameters.

Drive functions

This option allows the user direct access to the parameters regarding the drive functions.

It is important that if any parameters concerning the above mentioned functions are to be modified, that the Inverter/motor system is in a safe state prior to the parameter changes.

Communications

This option allows the user direct access to the parameters that control and configure the communications fieldbus of the Inverter. The parameters can be viewed to confirm their settings and values, they can also be modified if they are not read-only parameters.

Diagnostics

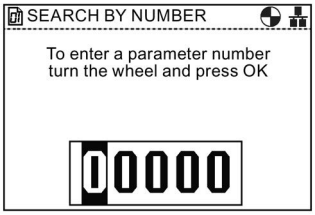
This option allows the user direct access to the parameters that monitor the state of the system.

All the parameters under these groupings are read-only and cannot be modified.

Search by number

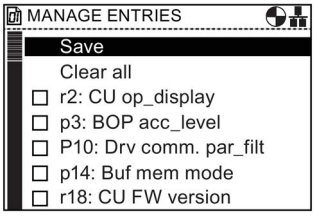
This option allows the user to search for a specific parameter number. Should the parameter number not exist, then the nearest parameter to the entered value is displayed.

If the parameter number does not exist, the screen will display a choice between "Select a new number" or "Go to the nearest parameter number".



My parameters

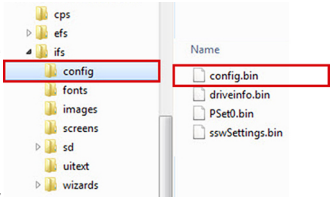
This option allows the user to select the parameters that they wish to list. The user is presented with a list of parameters that can be selected. Once selected - only those parameters are displayed when the "My Parameters" option is selected. There are additional options that allow the user to manage their list of parameters.



Copying the "My Parameters" list to another IOP

When a "My Paramters" lists is created, it saves the lists in the **config.bin** file on the IOP.

To copy the config.bin, the following procedure should be performed:



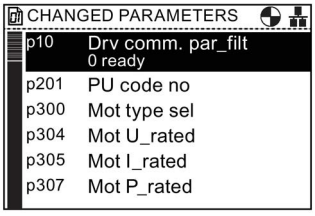
1. Connect the IOP via the USB to your PC (the IOP will enter "Mass Storage" mode.
2. Navigate to the **config** folder (shown in the screenshot and highlighted in red).
3. Copy the **config.bin** file to a suitable location on your PC.
4. Disconnect the IOP and connect a new IOP and copy the **config.bin** file to the new IOP.

Changed parameters

When the "Changed parameters" option is selected the IOP will search the Inverter parameter list for all the parameters that have had their values changed from the factory default settings.

Once the search is complete, the screen will present a list of all parameters that have changed values.

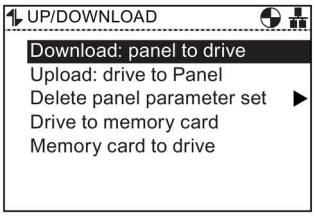
The individual parameters can be accessed so that their current values can be displayed and modified if necessary.



7.4 Up/Download

Overview

The upload and download options allow the user to save parameter sets to the various memory storage that is available to the system.



⚠WARNING

Unexpected behaviour of Inverter

During the transfer of data to and from the Inverter, it is essential that the transfer is not interrupted and the process is allowed to be completed. If the process is interrupted, it is possible that the data could be corrupted and the system may behave in an unexpected manner. Should an interruption of the transfer process occur, then it is highly recommended that a factory reset of the Inverter is performed prior to any further parameterization or giving the Inverter control of the application.

Fault screen during up/download

If during the up/download process a fault occurs and the fault screen is displayed, press ESC if you wish the up/download to be continued. If OK is pressed, it will cancel the up/download process.

Safety Parameters

If safety parameters are to be downloaded a function test of the safety functions has to be performed. Please refer to the "Safety Integrated Function Manual" which can be found at the hyperlink below:

Safety Integrated Function Manual
(http://support.automation.siemens.com/WW/view/en/50736819)

7.5 Custom parameter sets

Overview

Custom parameter sets can now be created and stored on the Intelligent Operator Panel (IOP).

The IOP can store up to 16 fixed parameter sets and up to 235 parameter sets with customized names.

The steps to create and store a custom parameter set on the IOP is given in the procedure outlined below.

Note

Custom parameter set file name limitations

Although the file name for a custom parameter set can be up to 96 ANSI characters in length, if all the file names are 96 characters long, it will eventually limit the number of parameter sets that can be saved on the IOP.

This is due to the specialized nature of the IOP's internal memory system.

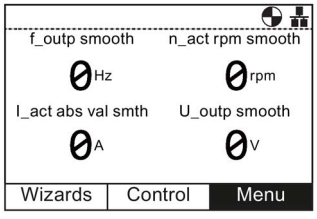
Standard parameter set access

New standard parameter sets can be uploaded from the drive to the IOP, but any standard parameter set (in the "ifs/config" folder) will not be accessible without either moving them to the "cps" folder or deleting the contents of the "cps" folder. This is because, when using customer parameter sets, the IOP automatically look at the "cps" folder. If the "cps" folder is empty, it will then search the "ifs/config" folder.

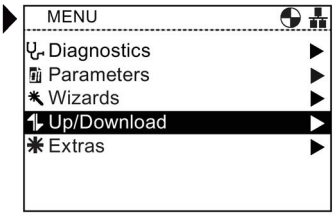
Creating a custom parameter set

This procedure makes the following assumptions:

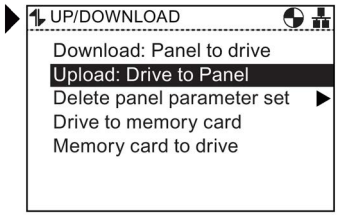
- The user is conversant with the copying and renaming of files in the Windows environment
- The user is conversant with commissioning the converter
- The user has already changed all the relevant parameters for their application
- The user has saved their customized parameter set in the IOP under Parameter Set 0 (although the user can assign their parameter set any of the available parameter set numbers).



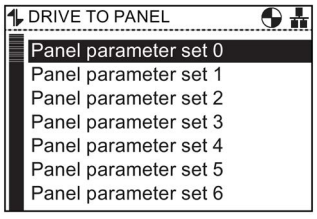
Select Menu



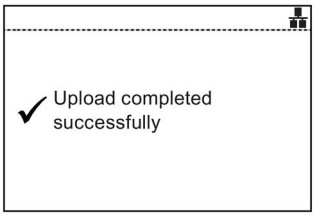
Select Up/Download



Select Upload:Drive to Panel

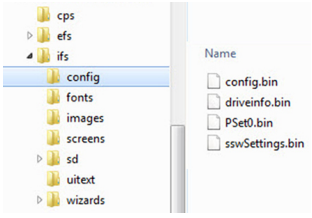


Select parameter set to upload to the IOP

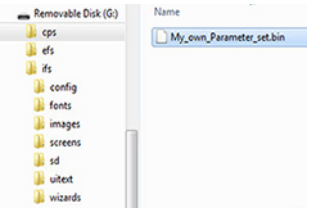


Screen displays successful upload

- Disconnect the IOP from the Control Unit
- Connect IOP to PC using USB cable
- IOP enters Mass Storage device mode
- Open Windows explorer on the PC

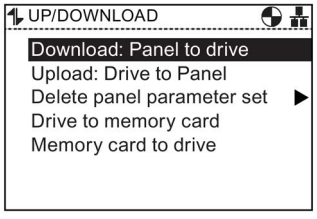


Copy the "PSet0.bin" file to the "CPS" folder

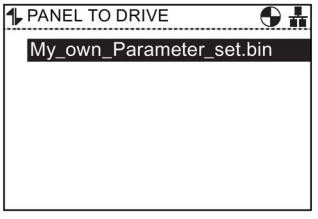


Rename the "PSet0.bin" file to "My_own_Parameter_set.bin"

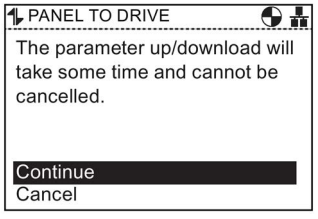
- Disconnect the IOP from the PC and reconnect the IOP to the Control Unit.



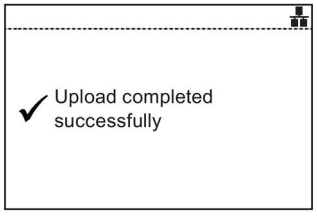
Select Download: Panel to drive



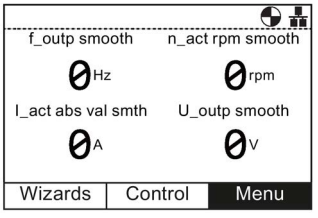
Select your parameter set and press OK



Select continue to commence download



Screen displays successful download



Screen returns to Status Screen

Copying IOP parameter sets

When you have saved a number of parameter sets to an IOP, it is possible to copy your saved parameter sets to another IOP using the simple process outlined below.

1. Connect the IOP via the USB connector to a PC.
2. The IOP will enter the "Mass Storage Device" Mode.

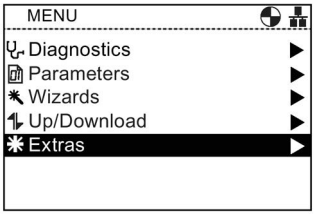
3. On the PC, navigate to the "ifs/config" folder.
4. Select the parameter sets you require and save them to a new folder on the local drive of the PC.
5. Disconnect the IOP from the PC.
6. Connect another IOP and copy the saved parameter sets to the "ifs/config" on the new IOP.

This procedure can be repeated for any number of IOPs.

7.6 Extras

Overview

The Extras menu presents a number of options for the configuration of the IOP, these are explained in this section.



Status-screen wizard

Scalar value

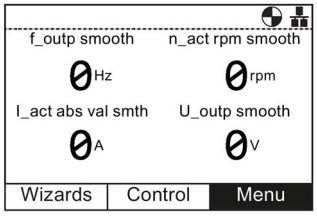
The bar graph (default status screen) and the Scalar value are setup using a similar procedure. The example below show how to setup the Scalar value status screen.

Note

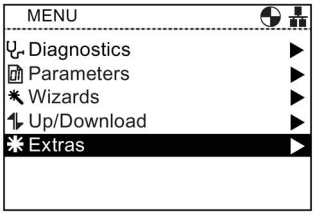
Scalar view limits for the SINAMICS G110D

Normally, four values can be displayed on the IOP in scalar view, but when using the IOP in conjuction with the SINAMICS G110D only two values can be displayed on the IOP screen.

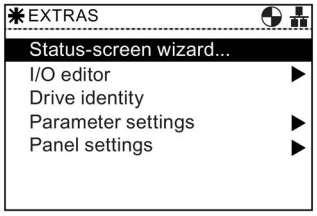
The status-screen wizard allows the user to configure the information displayed on the status screen. By default it displays output voltage and output frequency of the Inverter. These can be changed by using the wizard to select other physical values of the Inverter. Displayed units of value can be specifically adapted using known conversion factors and with the addition of an offset value to allow the units of measure to be displayed as required for the users application.



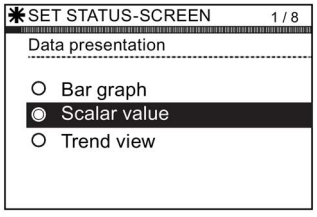
Select Menu



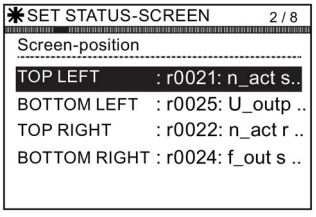
Select Extras



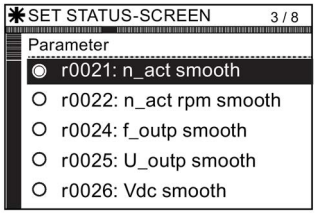
Select Status-screen wizard



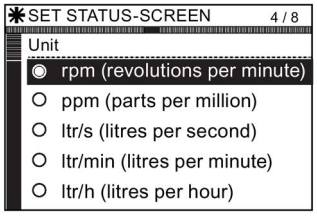
Select Scalar value



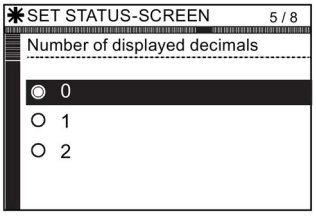
Select the screen position of the values



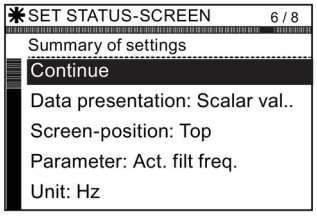
Select the parameters to be displayed



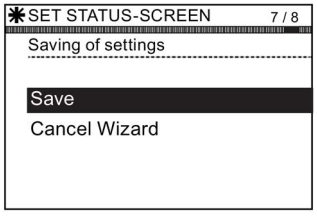
Select the unit of measure



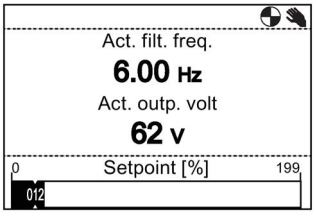
Select the demical places



Confirm settings



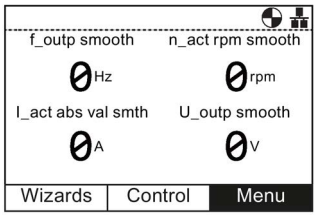
Save settings



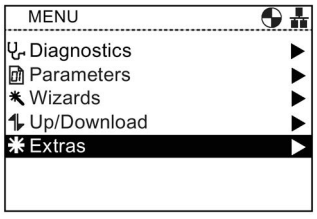
Scalar status screen displayed

Trend view

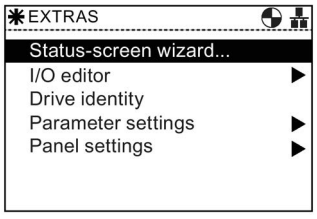
The Trend view allows the user to configure real-time monitoring of the Inverter and display the desired values in the form of a graph. To setup the Trend view, the following steps should be performed.



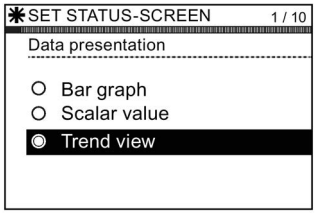
Select Menu



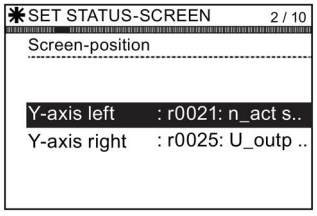
Select Extras



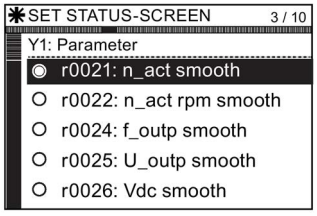
Select Status-screen wizard



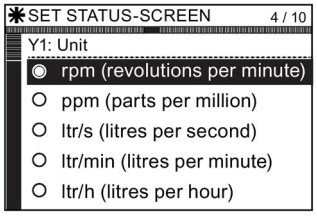
Select Trend view



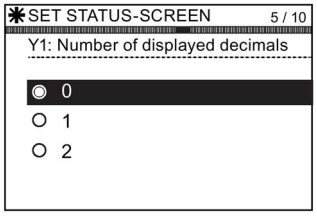
Select screen position



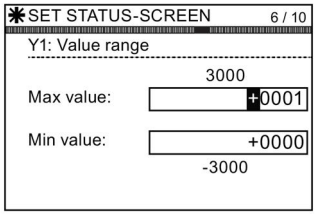
Select parameter to be displayed



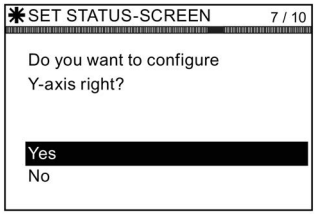
Select Unit of measure



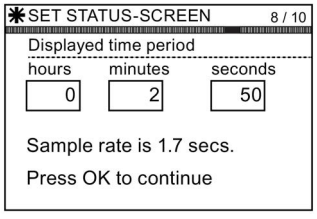
Select decimal places of displayed values



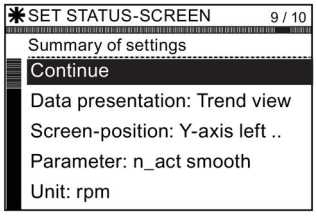
Select value range



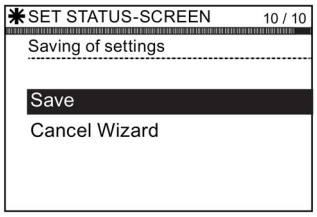
Configure Y-axis



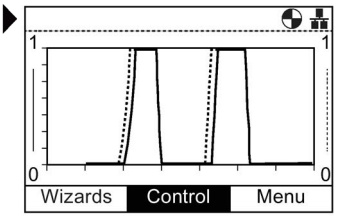
Configure displayed time period



Select Continue



Save settings



Status screen displayed with Trend view

With a long press of the **INFO** button, the graph data is written to a Trend information file on the IOP. An example of the Trend information file and its location is given in the figure below.

```
Trend Information
---------------------
Template:
Axis:Param Number<index>:<bit>:Param Name

Left axis (Y1): r0021    : - : Act. filt. freq.
Right axis(Y2): r0025    : - : Act.outp. volt

Time period: 150 Secs.
Sample rate: 1.5 Secs.

Sample     Y1(Hz)          Y2(V)
-----------------------------------
  1         0.000         17.920
  2         0.000         20.233
  3         0.000         20.234
  4         0.954         27.541
  5         3.240         43.577
  6         3.497         44.495
  7         5.325         58.811
  8         6.497         65.728
  9         4.832         50.322
 10         0.000         20.143
 11         0.000         20.240
 12         0.000         20.240
 13         3.046         42.973
 14         6.772         70.384
 15        10.342         94.288
 16        13.492        116.783
 17        13.998        120.530
 18        13.998        120.532
 19        13.998        120.533
 20        13.998        120.535
 21         9.169         82.063
 22         0.000          0.000
 23         0.000          0.0
 24         0.000
```

To access the Trend Information file, navigate to the following directory on the IOP:

/efs/health/TrendSample.txt

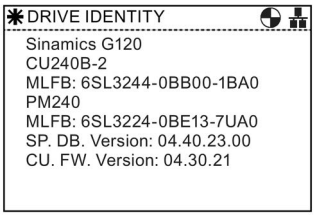
Image 7-2 Trend information file

I/O Editor

For a complete description of the I/O Editor function, see I/O Editor (Page 57)

Drive identity

This option allows the user to display the technical details of the components that comprise the Inverter system. This includes the details of the Control Unit and Power Module. This is a read-only screen and cannot be modified.



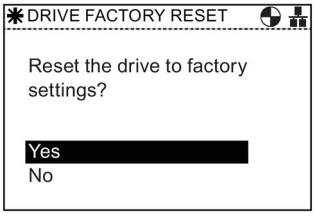
Parameter settings

Drive factory reset

There are two factory reset options:

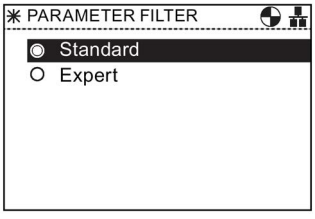
Factory reset - This option reset all parameters to there factory default settings. Any safety parameters that have been modified will not be reset.

Safety factory reset - This option reset all the drive parameters, including the safety parameters back to the factory default settings.



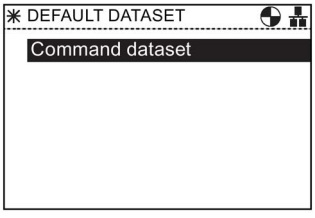
Parameter filter

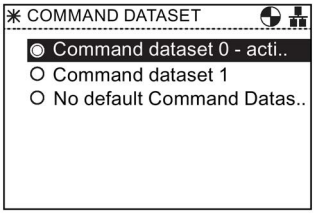
This option allows the user to select the parameter access level. Expert is the default access level, which gives the user access to the most frequently used parameters. Expert level gives access to all available parameters.



Default dataset

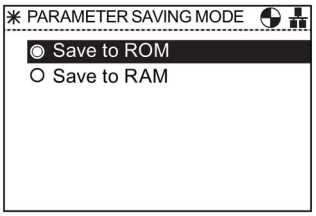
This option allows the user to determine which is the default command dataset when viewing or selecting a new default dataset from the options provided.





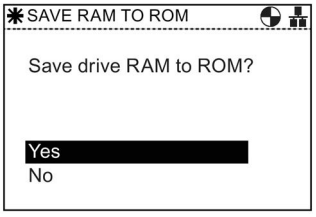
Parameter saving mode

This option allows the user to set the default location for any save function performed on the Inverter.



Save RAM to ROM

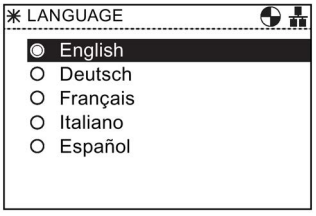
This option allows the user to manual save all drive data from the Inverters internal memory to the internal non-volatile memory - thus data save will be retained within the Inverter until it is overwritten.



Panel settings

Language

This option allows the user to select the language that is used to display information and text on the IOP. This options has been previously described in the initial set-up section of this manual. Languages can be added or deleted using the USB connection on the IOP and a PC.

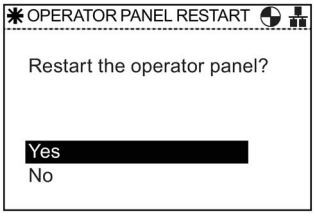


For details of selecting this function see Initial Set-up (Page 18)

The languages on the IOP can be managed using the IOP Updater software. For more information see IOP Updater (Page 23).

Operator panel restart

Should the user wish to restart the operator panel, this option allows the IOP to be restart without the loss of any settings.

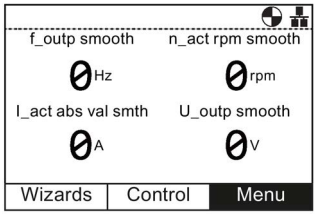


Time and date settings (including Daylight savings time)

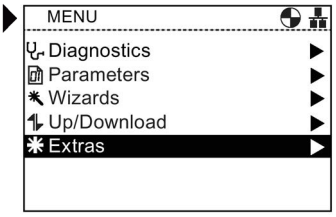
If the CU to which the IOP is fitted has a real-time clock, then the option to set the correct date and time (including daylight savings time is presented in the "Panel settings" menu.

The Time and date settings allow you to setup up the following:

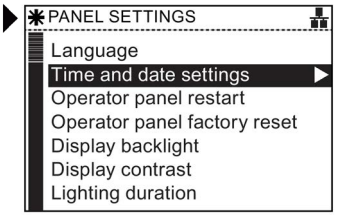
- **Date format** - This allows the date format to be select either DD/MM/YY or MM/DD/YY.
- **Time and date settings** - This allows the user to set the required date and time of the internal real-time clock of the Control Unit.
- **Daylight saving time** - This allows the user to setup the daylight saving time difference on the Control Unit (CU230P-2) real-time clock. The daylight saving time is set to take into account not only the time difference but also the date and time of the change to and from daylight saving time. The setup of the DST function is shown in the following procedure.



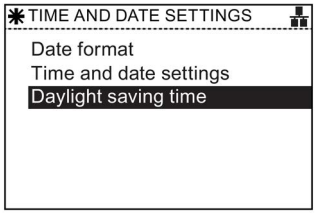
Select Menu



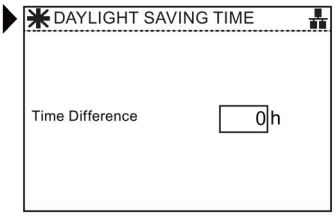
Select Extras



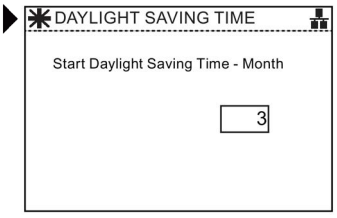
Select Time and date settings



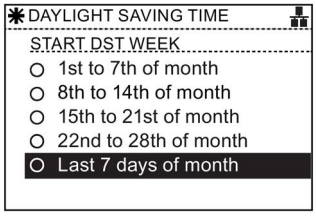
Select Daylight saving time



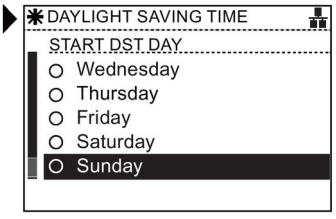
Set DST time difference



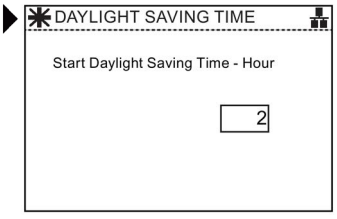
Set month DST starts



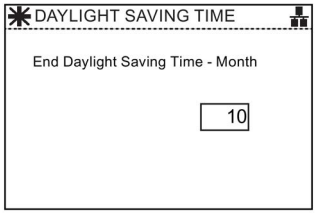
Set week DST starts



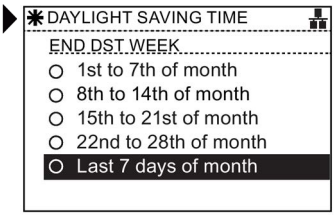
Set day DST starts



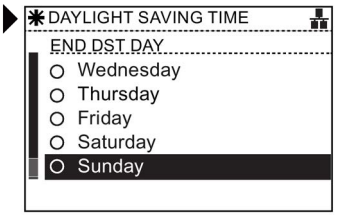
Set time DST starts



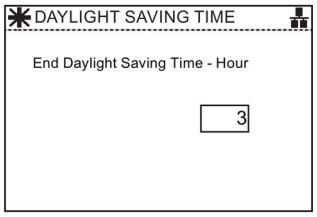
Set month DST ends



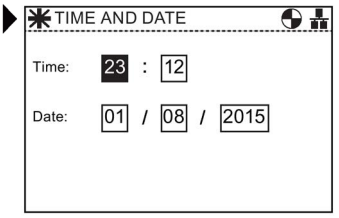
Set week DST ends



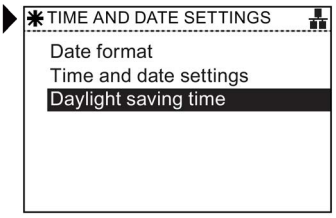
Set day DST ends



Set time DST ends



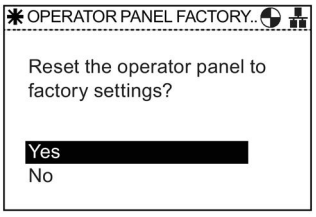
Set date and time



IOP returns to previous screen (this may take a few seconds)

Operator panel factory reset

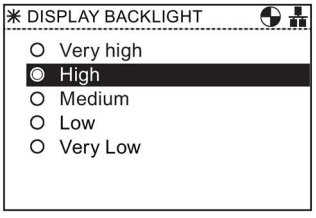
This option resets the IOP to its default factory settings. All previous settings stored on the IOP will be lost. Any parameter sets stored on the IOP will not be deleted.



Display backlight

This option allows the user to change intensity of the display lighting.

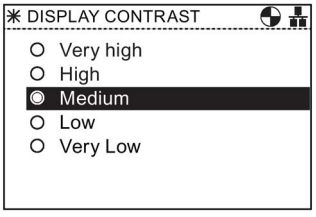
For details of selecting this function see Initial Set-up (Page 18)



Display contrast

This option allows the user to change the contrast between black and white on the display.

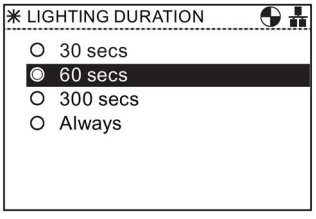
For details of selecting this function see Initial Set-up (Page 18)



Lighting duration

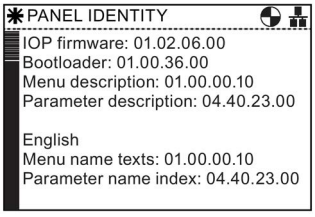
The backlight display, by default, is set to automatically turn off after 60 seconds from the last key press. This time can be adjusted to 30 seconds, 60 seconds, 300 seconds or permanently on.

For details of selecting this function see Initial Set-up (Page 18)



Panel identity

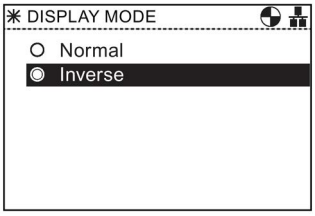
The panel identity screen displays the following technical information regarding the IOP:



- IOP firmware version
- menu description version
- Parameter description version
- Menu texts version
- Parameter name index version
- Wizard description version.

Display mode

Display mode allows the user to select the manner in which text is displayed.



- "Normal" displays black text on a white background.
- "Inverse" displays white text on a black background.

For details of selecting this function see Initial Set-up (Page 18)

7.7 I/O Editor

Overview

The I/O Editor allows the user to configure the digital and analog inputs and outputs of the converter.

An example of how the configuration of the inputs and outputs is given in the procedure below. It should be noted that the following screens are for demonsration purposes only and the actual screens may vary depending upon the type and firmware of the converter that is being used.

CAUTION

Changing pre-assigned input and output settings

Some inputs and outputs may already be assigned a function, it is recommended that these assigments are not changed, unless it is required for a particular type of application.

If the pre-assigned inputs/outputs are changed, it is essential that the application is checked to ensure it will function correctly and as expected.

⚠ CAUTION

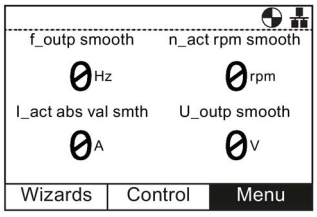
Removal of the ON/OFF command

If removing the ON/OFF command from a digital input (p0840), the indice will be changed to 1, thereby resetting this parameter.

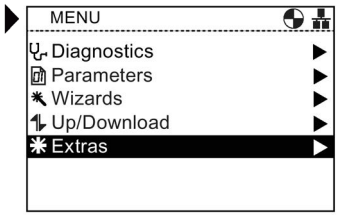
This will make the ON/OFF function of the converter not operate correctly, or as anticipated by the user.

Please ensure that during the commissioning of the converter the ON/OFF command functions properly and as expected for your specific applicatioin.

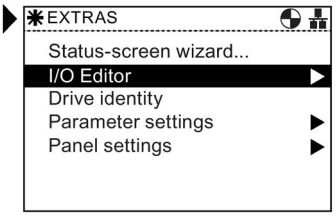
Editing the inputs and outputs



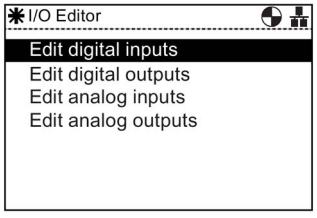
Select Menu



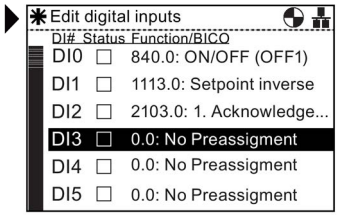
Select Extras



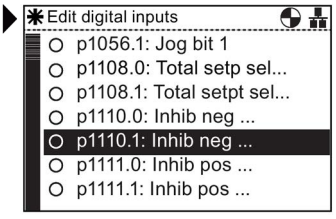
Select I/O Editor



Select I/O to be configured



Set the actual I/O



Select the function of the I/O

When the final selections have been made, press ESC twice to return to the I/O Editor screen to configure another input or output or a long press of ESC to return to the general status screen.

7.8 Write Protection

Introduction

The write protection function has been designed to prevent the settings within the Inverter from being inadvertently changed. There is no password required to activate the write protection function.

Given in the table below is a list of the parameters that are excluded from write protection.

Table 7- 1 Parameters and functions excluded from write protection

Parameter	Function
p0003	Sets the access level to read and write parameters.
p0010	Sets the parameter filter to commission an Inverter.
p0124[0...n]	Identification of the Control Unit using an LED.
p0970	Initiates the reset of the Inverters parameters.
p0971	Saves parameters in the non-volatile memory of the Inverter.
p0972	Sets the required procedure to execute a hardware reset of the Inverter.
p2111	Maintains a count of the number of alarms that have occurred since the last reset.
p3950	Access to service parameters - only for service personnel and a password is required.
p3981	Used to acknowledge all active faults of the Inverter.
p3985	Sets the mode to change over the master control / LOCAL mode.
p7761	Activate/Deactivate write protection function.
p9400	Safely remove memory card.
p9484	BICO interconnection searches signal source.

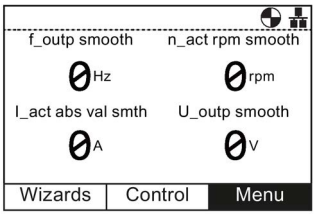
Note

Fieldbus communications using CAN, BACnet and MODBUS

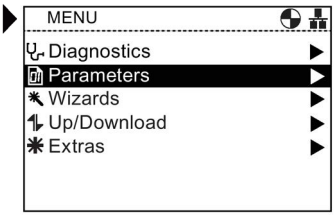
When using these fieldbus communications protocols it is still possible to change the parameter factory settings, even if the write protection function is active. To ensure that write protection, if required, is active over fieldbus communications, then parameter p7762 must be set to 1.

Activating/deactivating write protection

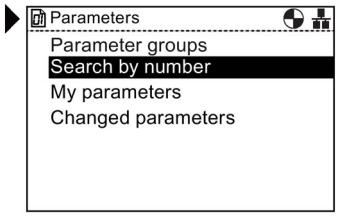
To activate or deactivate the write protection function, the following procedure must be performed:



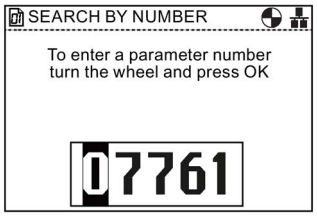
Select Menu



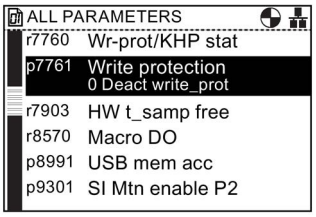
Select Parameters



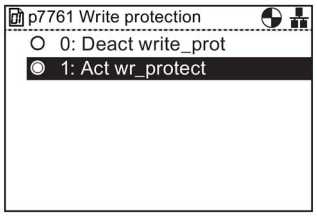
Select Search by number



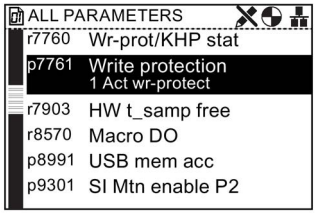
Enter the parameter number



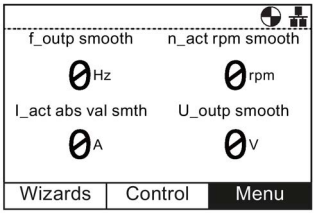
Select Write protection parameter



Select "1" to activate write protection



Write protection is shown as active



Pres ESC twice to return to status screen

To deactivate the write protection function follow the same procedure as shown above but select "0: Deact write-prot".

7.9 Know-how Protection

Introduction

Know-how Protection (KHP) has been designed to allow machine manufacturers to completely hide all the modified parameters of the Inverter. This means that not only can these parameters not be changed, they are not visible to the end-user of the system.

Note

Technical support for active KHP

If KHP is activated and technical support is required, this will only be possible with the consent of the machine manufacturer.

Given in the table below are the parameters that are excluded from the KHP function:

Table 7- 2 Parameters and functions excluded from write protection

Parameter	Function
p0010	Sets the parameter filter to commission an Inverter.
p0918	PROFIBUS address
p0970	Initiates a reset of the drive parameters.
p0971	Saves parameters in the non-volatile memory of the Inverter.
p2030	Fieldbus int protocol selected

Parameter	Function
p2042	PROFIBUS indent number
P7766 [0...29]	KHP Password input - activates/deactivates the KHP function.
p8929	PN remote controller number
p8991	USB memory access
p8999	USB functionality
p9930 [0...8]	System logbook activation
p9931 [0...129]	System logbook module selection
p9932	Save system logbook EEPROM

Know-how Protection (KHP) parameters

Listed below are all the parameters used to activate, deactivate and modify the KHP, including a brief description of their purpose.

Table 7- 3 Know-how Protection

Parameter	Function
P7763	KHP OEM exception list number of indices for p7764. Maximum value is 500.
P7764 [0...n]	KHP OEM exception list. Sets the parameters to be excluded from the KHP function.
P7765	KHP memory card copy protection. Activates/deactivates copy protection for the memory card.
P7766 [0...29]	KHP password input. Sets the password for KHP.
P7767 [0...29]	KHP new password. Allows a new or an initial password to be created for KHP.
P7768 [0...29]	KHP password confirmation.

Activating/deactivating Know-how protection (KHP) overview

Before the KHP function can be activated for the first time the following steps should be performed (a simplified flowchart to show the process is given in the figure below).

1. The Inverter must be commissioned for the application before even attempting to activate the KHP function.
2. The application, for which the Inverter has been commissioned, must be tested to ensure that all parameter settings functioning correctly.
3. Using parameter p7763, you must set the number of parameters that can be included in the exception list. The maximum number of parameters that can be included in this list is 500.

4. Using parameter p7764, you must define a list of the parameters you wish to exclude from the KHP function; this is known as the "exception list". The exception list parameters will be visible to the end-user and they can be modified.

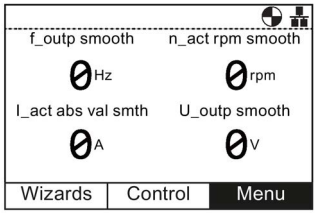
> **⚠ CAUTION**
>
> **Important information when implementing KHP**
>
> If parameter p7766 is not included or is removed from the exception list, a password can no longer be entered and KHP cannot be deactivated. If this occurs then the only way to access the parameters of the Inverter will be to perform a factory reset of all parameters.

5. Using parameter p7767, create a new password for the KHP function.
6. Using parameter p7768, confirm the password. Once this step has been completed the KHP function is activated.
7. The function can now be deactivated or activate by using only p7766 to input the password that has been created.

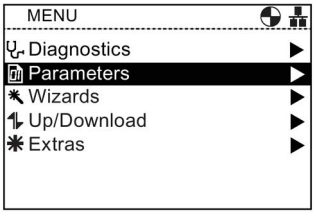
A complete example of all these individual steps is given below.

Setting up the exception list

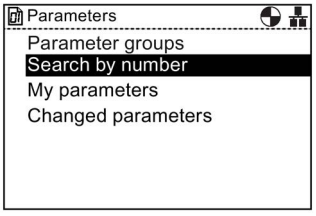
As previously stated, after commissioning the Inverter and checking that parameters have been set correctly, the number of parameters to included in the exception list must be determined and set in parameter p7763. To set the number of parameters to be included in the exception list the following procedure must be performed. When establishing the first exception list, some parameters may already be entered into the exception list; under no circumstances should you remove these parameters from the exception list as these are essential parameters that must remain in the exception list.



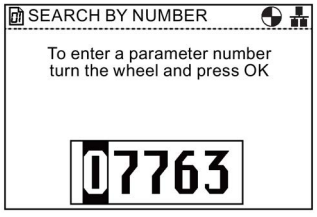
Select Menu



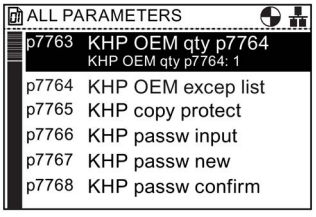
Select Parameters



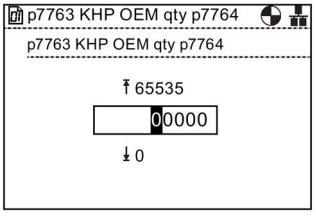
Select Search by number



Search for parameter 07763



Select p7763

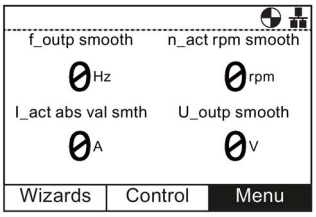


Input number of parameters to be included in the exception list.*

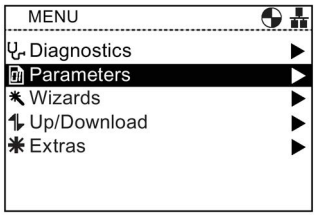
*Although the maximum range shown on the screen is 65535, the maximum number of parameters in the exception list must not exceed 500.

Creating the exception list

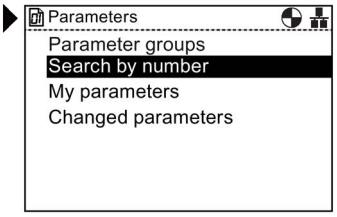
To create the list of parameters that will be included in the exception list, the following procedure should be performed:



Select Menu

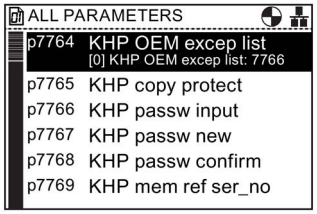


Select Parameters

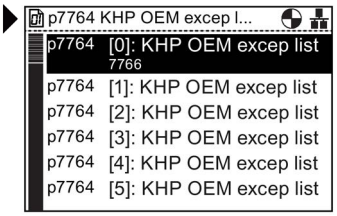


Select Search by number

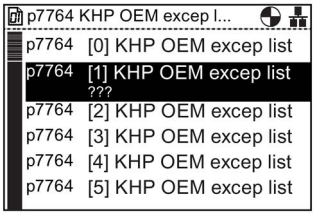
Search for parameter 07764



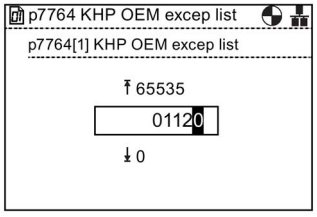
Press OK to edit parameter 07764



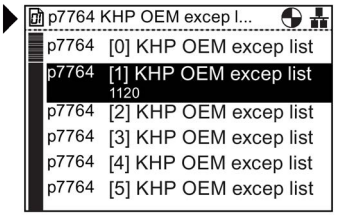
p07764[0] must not be modified



Scroll to next indices p7764[1]



Input parameter to be added to exception list. Press OK



Scroll to next indices to add another parameter to the exception list*

*Repeat these steps until all the excluded parameters have been entered.When the exception list is completed, use a long press of the ESC key will return the IOP to the status screen.

Setting the password

When setting the password for the KHP function the user should take note of the following guidlelines:

- The password can be up to thirty characters in length.
- Password entry must start with p7766 [0].
- No gaps are permissible in the password.
- Entering a password is completed when writing to p7766 [29]. Where the password is less than 30 characters in length, then p7766 [29] = 0 should be used to complete the password entry.

When entering the individual characters of the password in p7766 [0...29], each indices will contain only one character and it will be entered as a decimal code from the standard ASCII table.

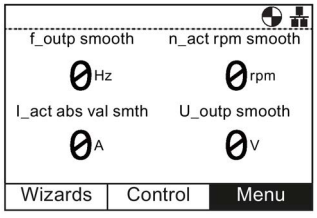
For example, the password "MaC" would be entered as ASCII code in each individual indices of parameter p7766:

Character	ASCII code
M	77
a	97
C	67

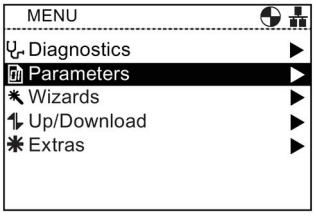
It is recommend that only ASCII decimal codes between 32 and 126 are used for the password characters.

To set a new password the following procedure should be performed:

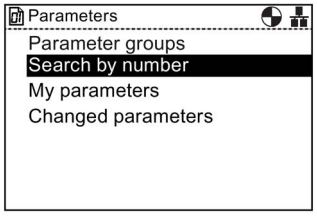
The example password given previously in this section will be used as the password that will be entered as the new password.



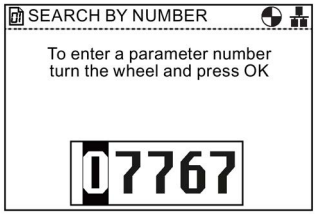
Select Menu



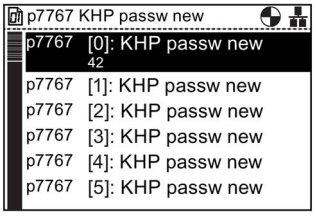
Select Parameters



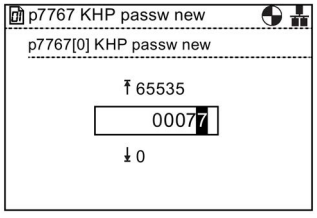
Select Search by number



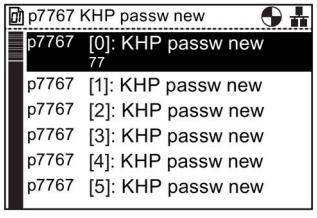
Search for parameter 07767



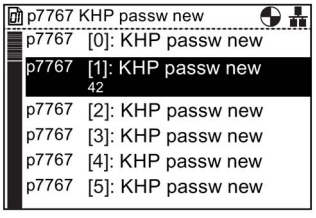
Press OK to edit indice [0]



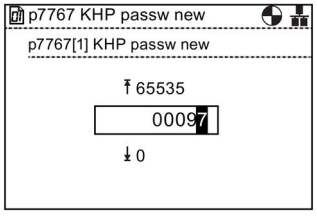
Input ASCII for 'M' (77) and press OK



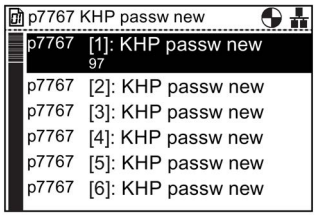
Screen shows indice [0] changed to '77'



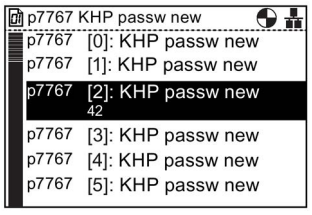
Select next indice and press OK



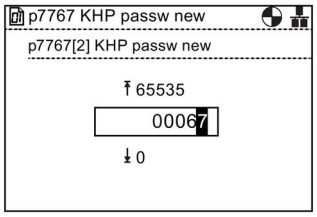
Input ASCII code for 'a' (97) and press OK



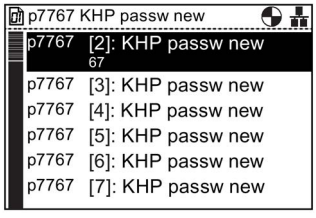
Screen shows indice [1] changde to '97'



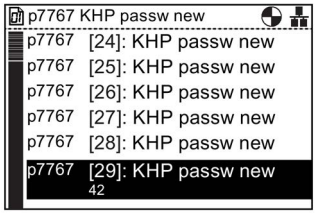
Select next indice and press OK



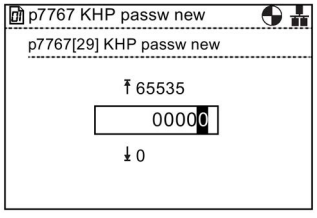
Input ASCII code for 'a' (67) and press OK



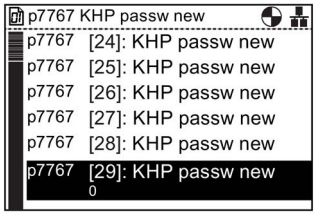
Screen shows indice [2] changed to '67'



Scroll to indice [29] and press OK



Ensure all the number are zero and press OK[1]

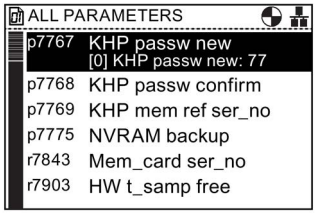


Screen shows indice [29] changed to '0'

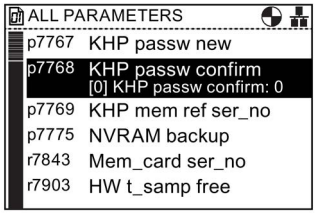
- The password has now been set.
- Press ESC to return to the "ALL PARAMETERS" menu in preparation for confirming the new password.
- [1]Because the password is less than 30 characters, p7767 indice [29] must contain the value 0.

Confirming the password

Once the new password has been entered as shown above, the password needs to be confirmed using parameter p7768. The "ALL PARAMETERS" screen should be shown from the previous procedure. To confirm the password, the following procedure should be performed:

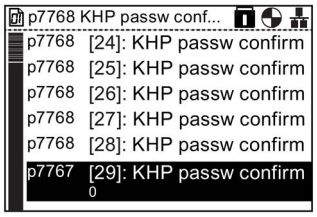


Scroll to p7768 (KHP passw confirm)



Press OK to edit parameter

- Continue to enter the password in each indices, in same way that was used to enter the original password in the previous procedure.
- Ensure that p7767[29] has the value '0'



Screen displays the padlock symbol to show KHP active

- To deactivate the KHP function input the password using the parameter p7766 (KHP passw input).

Options

8

8.1 Door mounting kit

Door mounting kit

To allow the IOP to be mounted into the door of a cabinet, the door mounting kit (DMK) has been designed. This will allow the IOP to be fitted to the front of a panel or door and be IP54 rated.

The fitting of the DMK is accomplished as shown in the figure below.

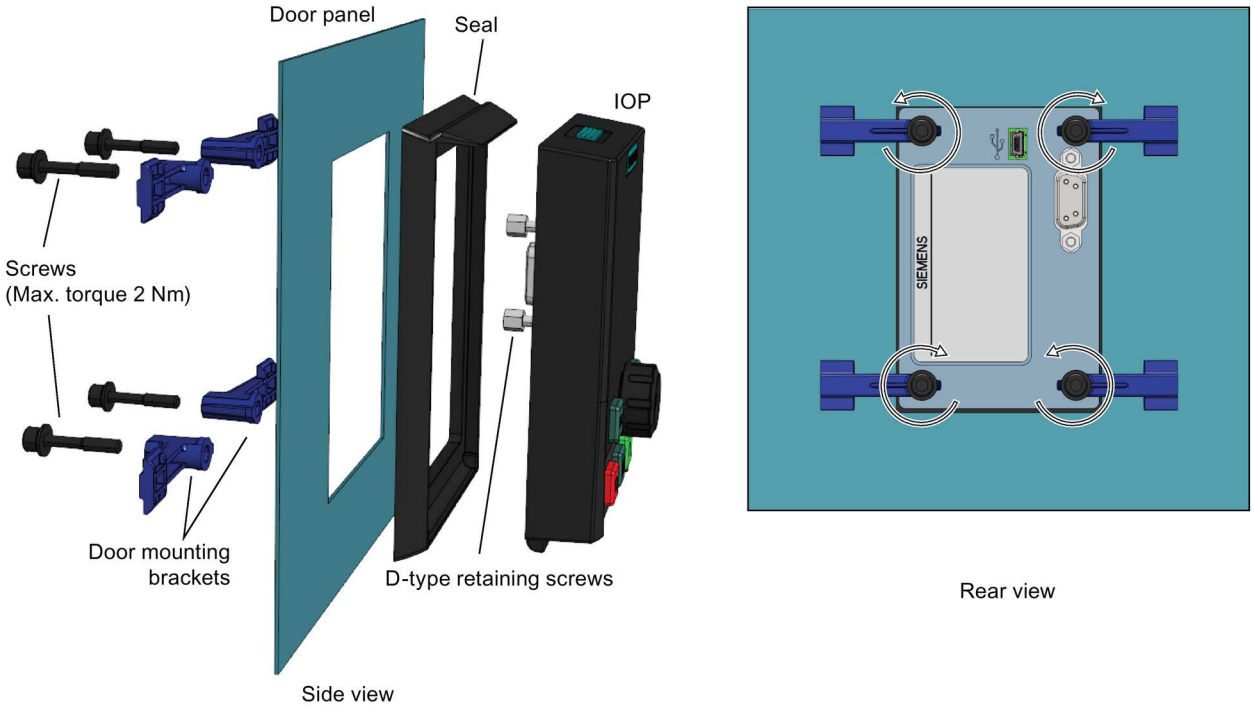
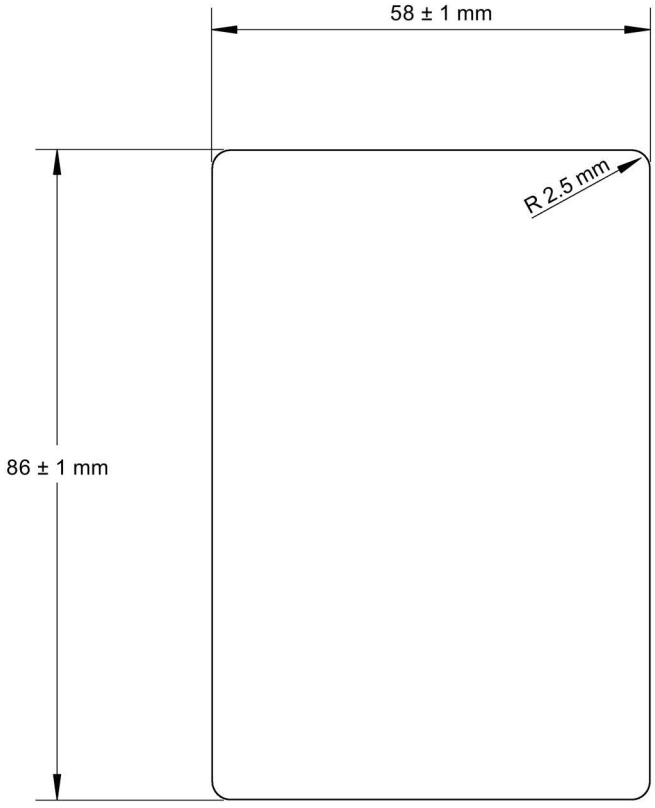


Image 8-1 Installation of IOP door mounting kit

Prior to the installation of the DMK, it is necessary to create a hole in the panel or cabinet with the dimensions as shown in the figure below:



Scale 1:1

Notes:
1. The page must be printed at full size to maintain the 1:1 scale.
2. When printing from a PDF file do not select the "fit to page" option as this will reduce the page to 97% of the true size.

Image 8-2 IOP DMK drill pattern (Scale 1:1)

The depth of the panel or cabinet door should be between 1 mm to 3 mm

The IOP Door Mounting Kit can be ordered using the following order number:

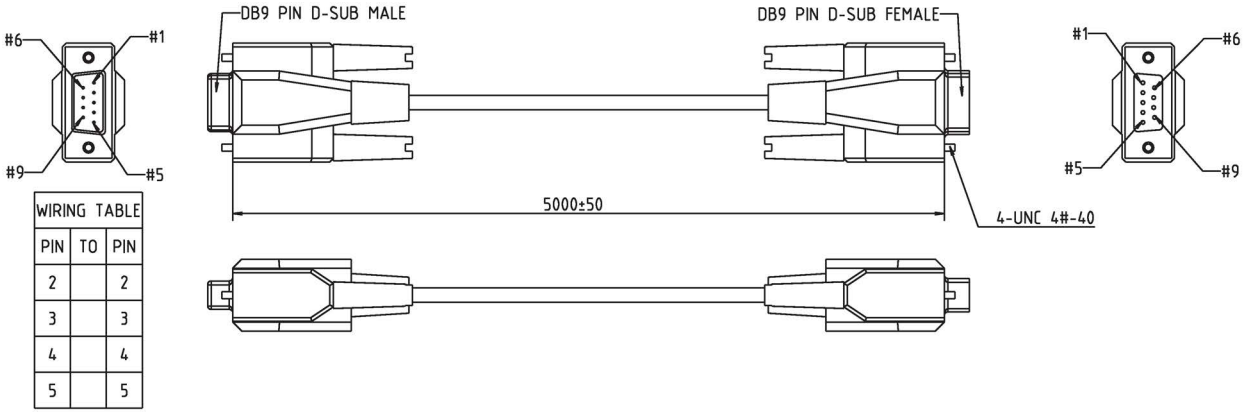
6SL3256-0AP00-0JA0

The DMK contains the following items:

- Door seal
- Door mounting brackets (x 4)
- Retaining screws (x 4)
- RS232 cable (5 m)

RS232 cable specifications

The RS232 cable can have a maximum length of 10 metres without restrictions. The RS232 cable can be longer than 10 metres and up to a maximum length of 15 metres, but the communications speed cannot excedd 57,600 bauds.



WIRING TABLE		
PIN	TO	PIN
2		2
3		3
4		4
5		5

Image 8-3 9-way male to female D-Type cable Specifications

8.2 Hand-held device

hand-held device

⚠ WARNING

Charging unit

- The charging unit for the rechargeable batteries is contained within the hand-held device for the sole purpose of charging rechargeable batteries.
- The charging unit contained within the hand-held device should not be used with standard "AA" batteries as this will result in damage to the batteries and the hand-held device.
- Only the supplied power supply unit should be used with the IOP. The use of any other power supply units could seriously damage the hand-held kit.

⚠CAUTION

General precautions

- There is a risk of explosion if battery is replaced by incorrect type.
- Overcharging, short circuiting, reverse charging, mutilation, or incineration of the cells and the batteries must be avoided to prevent one or more of the following occurrences; release of toxic materials, release of hydrogen and/or oxygen gas, rise in surface temperature.
- If a cell or a battery has leaked or vented, it should be replaced immediately using protective gloves.
- If and when necessary, these cells or batteries must be replaced with identical new ones from the same manufacturer. If a cell or a battery to be replaced is connected with other cells or batteries in series, it is recommended that the other cells or batteries be replaced with new ones at the same time.
- Battery compartments containing these cells or batteries must be provided with means of ventilation to prevent possible accumulation of any released gases under abnormal conditions.

Note

Battery lifetime

With the supplied rechargeable batteries in a fully-charged state they should last for approximately 10 hours; the use of normal "AA" batteries may last considerably less time.

Industrial environment

The IOP has been designed for use within a Class A Industrial environment only.

Disposal of batteries

The batteries supplied with the IOP must be disposed of in accordance with local and national environmental policies.

Battery status

The battery status is displayed at the top right-hand corner of the IOP display.

Battery charging

If the batteries are put on charge and the batteries are fully discharged; the charging unit will enter a 'pre-charge' state. During the pre-charge state the LED will not be lit, therefore there may be a delay before the charging LED lights up.

The IOP has no internal power source, so to increase the IOP's versatility, the hand-held device has been designed.

The complete list of converters that work with the IOP are listed in Introduction (Page 11). The following list comprises the converters that require the hand-held kit because the IOP cannot be mounted directly on the converter:

- SINAMICS G120D-2 CU240D-2
- SINAMICS G120D-2 CU250D-2
- SINAMICS ET 200pro FC-2
- SINAMICS G110D

- SINAMICS G110M
- SINAMICS S110 CU305

Table 8- 1 Hand-held device order information

Order number	Item quantity	Item	Remarks
6SL3255-0AA00-4HA0	1	IOP	
	1	Hand-held module	
	1	Power supply unit	
	4	Rechargeable batteries	1.2 V 2100 mAh NiMH (see table below)
	1	RS232 cable	3 m

Note

Battery order information

The batteries supplied with the IOP Hand-held Kit should be replaced with exactly the same type of batteries. The batteries that have been tested for use with the IOP are given below:

Company: GP Batteries

Order Number: GP210AAHC

The batteries can be ordered from the following website: GP Batteries (http://www.gpbatteries.com/INT/index.php)

The layout of the IOP hand-held device is shown in the figure below.

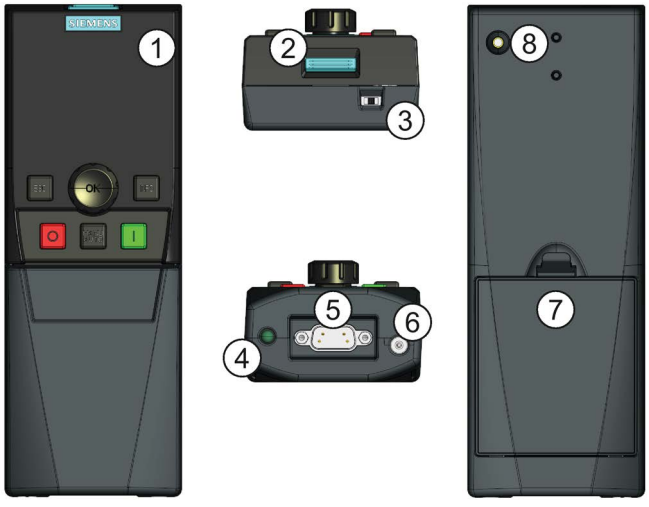


Image 8-4 IOP hand-held kit layout

1. Intelligent Operator Panel (IOP)
2. IOP release catch
3. ON/OFF switch

4. Charging LED - ON when charging, OFF when charged
5. 9-pin Sub-D male connector (RS232)
6. Charging unit input
7. Battery compartment cover
8. IOP retaining screw

Fitting the batteries

The hand-held device is powered by four 'AA' rechargeable batteries; these batteries are supplied with the hand-held kit. The batteries are fitted as shown in the figure below.

Image 8-5 Installing batteries for handheld kit

Technical data

9

IOP technical data

Table 9- 1 IOP and Door mounting kit specifications

Feature	IOP only	Door mounting kit
Protection	Depending upon the Control Unit IP rating to a max. of IP54	
Dimensions (HxWxD)	106.86 mm x 70 mm x 30.06 mm (Depth includes width of wheel)	
Net weight	0.134 Kg (0.295 lbs)	
Gross weight	0.206 Kg (0.454 lbs) - Includes packaging	
Screw torque	-	Max. 2 Nm
Operating ambient temperature	0 - 50 °C (32 - 122 °F) when directly connected to the converter. 0 - 55 °C (32 - 131 °F) when using the Door Mounting Kit.	
Transport and storage ambient temperature	-40 - +70 °C (-40 - 158 °F)	
Humidity	Maximum absolute humidity 25 g/m^3	

Table 9- 2 Hand-held specifications

Feature	IOP Hand-held kit
Protection	IP20
Dimensions (HxWxD)	195.04 mm x 70 mm x 47.99 mm
Net weight	0.724 Kg (0.1.59 lbs)
Gross weight	0.970 Kg (2.14 lbs) - Inlcudes packaging
Operating ambient temperature	0 - 40 °C (32 - 104 °F) [charging 10 - 40 °C]
Transport and storage ambient temperature	-20 - +55 °C (-4 - 131 °F)
Humidity	Relative humidity 90%

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Further Information

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