

User Manual

Slim Line Outdoor Touch Panel

Part Number:	80860.768
Version:	1
Date:	2010-08-06
Valid for:	TPE057ATQ

Version	Date	Modifications
1	06.08.2010	First Edition

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1 Important Notes

1.1 Symbols

The symbols in this manual are used to draw your attention on notes and dangers.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



DANGER

This symbol is used to refer to instructions which, if ignored or not carefully followed, will result in death or serious injury.



WARNING

This symbol is used to refer to instructions which, if ignored or not carefully followed, could result in death or serious injury.



CAUTION

This symbol is used to refer to instructions which, if ignored or not carefully followed, could result in minor or moderate injury.



NOTICE

This symbol and the accompanying text alerts the reader to a situation which may cause damage or malfunction to the device, either hardware or software, or surrounding property.



Reference to source of information

This symbol refers to detailed sources of information on the current topic.

1.2 Safety Notes

- Read this manual carefully before using the operating device. Keep this manual in a place where it is always accessible to all users.
- Proper transportation, handling and storage, placement and installation of this product are prerequisites for its subsequent flawless and safe operation.
- This user manual contains the most important information for the safe operation of the device.
- The user manual, in particular the safety notes, must be observed by all personnel working with the device.
- Observe the accident prevention rules and regulations that apply to the operating site.
- Installation and operation must only be carried out by qualified and trained personnel.

1.3 Intended Use

- The device is designed for use in the industry.
- The device is state-of-the art and has been built to the latest standard safety requirements. However, dangerous situations or damage to the machine itself or other property can arise from the use of this device.
- The device fulfills the requirements of the EMC directives and harmonized European standards. Any modifications to the system can influence the EMC behavior.

1.4 Target Group

All configuration, programming, installation, commissioning, operating and maintenance work in connection with the automation system must be performed by trained personnel only (e.g. qualified electricians, electrical engineers, etc.).

The configuration and programming personnel must be familiar with the safety concepts of automation technology.

The operating personnel must have been trained in handling the controller and be familiar with the operating instructions.

The installation, commissioning and maintenance personnel must have an education which entitles them to work on automation systems.

2 Installation and Commissioning

2.1 Unpacking the Device

Unpack all parts carefully and check the contents for any visible damage in transit. Also check whether the shipment matches the specifications on your delivery note.

If you notice damages in transit or discrepancies, please contact our sales department immediately.

2.2 Mounting the Device

**NOTICE: Damage**

When installing the device, leave a gap of at least 30 mm (1.181") around the device to ensure sufficient air circulation.

**NOTICE: Damage**

When the operating device is installed horizontally, please note that additional sources of heat beneath the operating device may result in heat accumulation. Make sure to allow sufficient heat dissipation!

Comply with the allowable temperature range listed in the technical data for the use of the operating device!

**NOTICE: Damage**

To maintain the specified degree of protection, make sure the seal is evenly seated on the installation surface and the hexagon nuts are tightened uniformly. Ensure that the maximum torque of 1 Nm is not exceeded.

The operating device can be easily and quickly mounted from the rear of the operating device. This is particularly recommended for mounting in switchboards with a plate thickness of approx. 1 mm to 6 mm (0.039" to 0.236").

1. Insert the operating device from the front through the mounting cutout.
2. Fasten the operating device using hexagon nuts.

2.2.1 Front Panel Dimensions

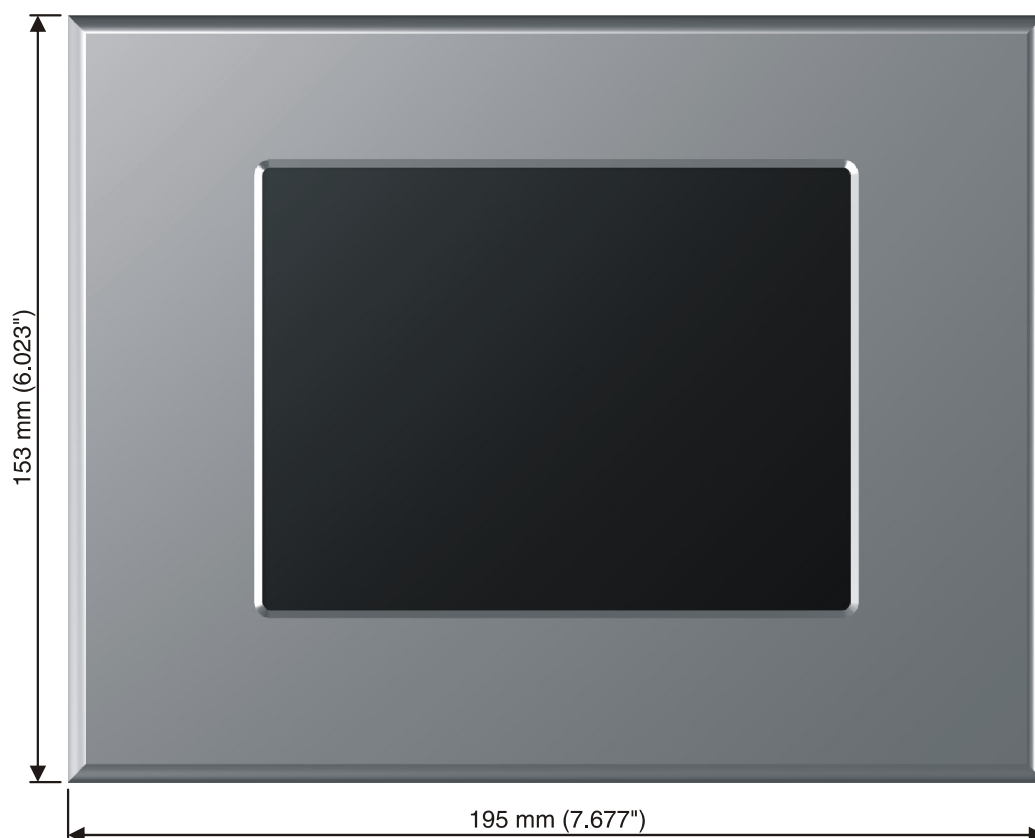


Figure 2-1 TPE057ATQ

2.2.2 Mounting Cutout

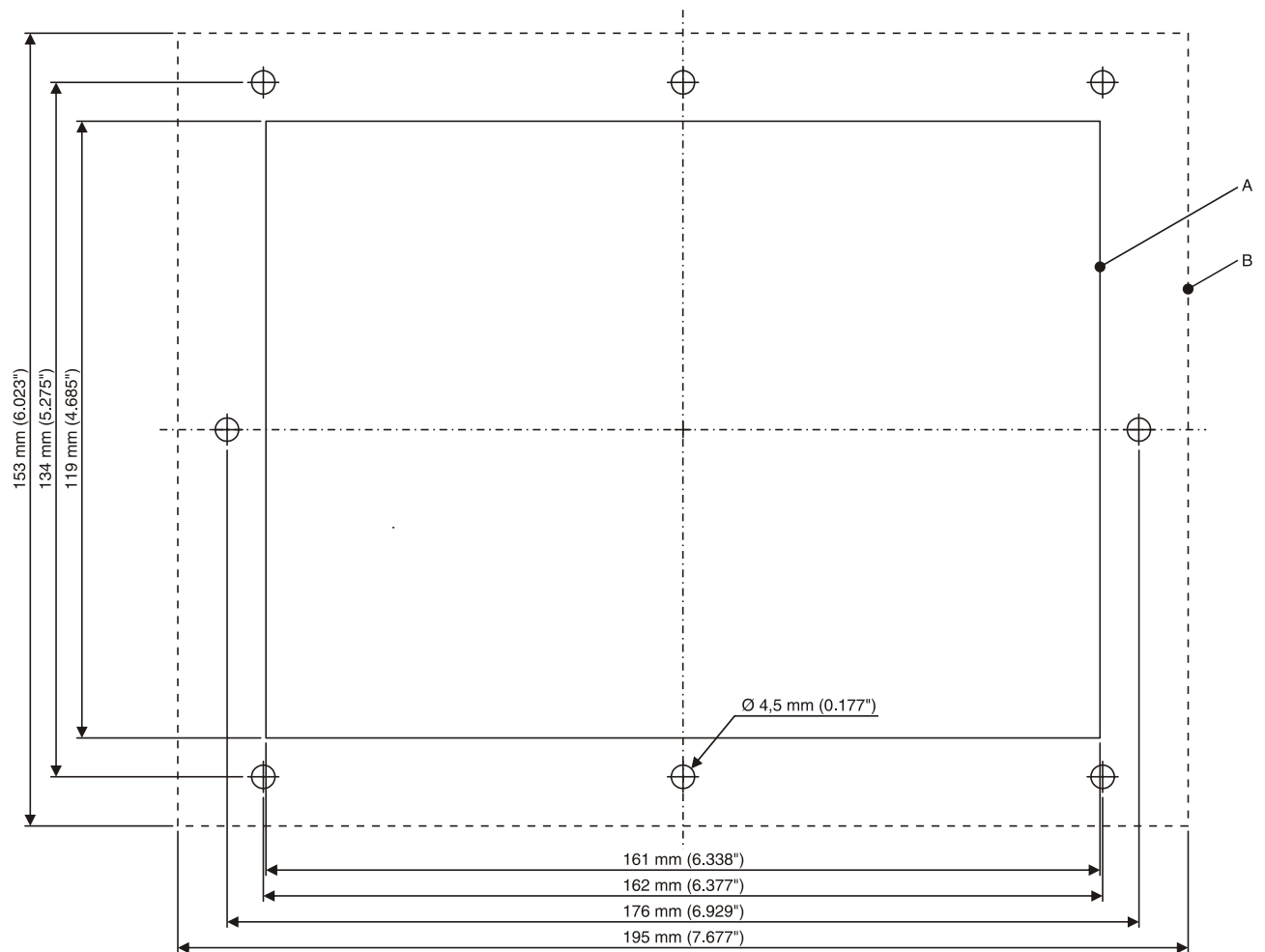


Figure 2-2 TPE057ATQ

- A Mounting Cutout
- B Front Panel

2.2.3 Side View, Mounting Depth

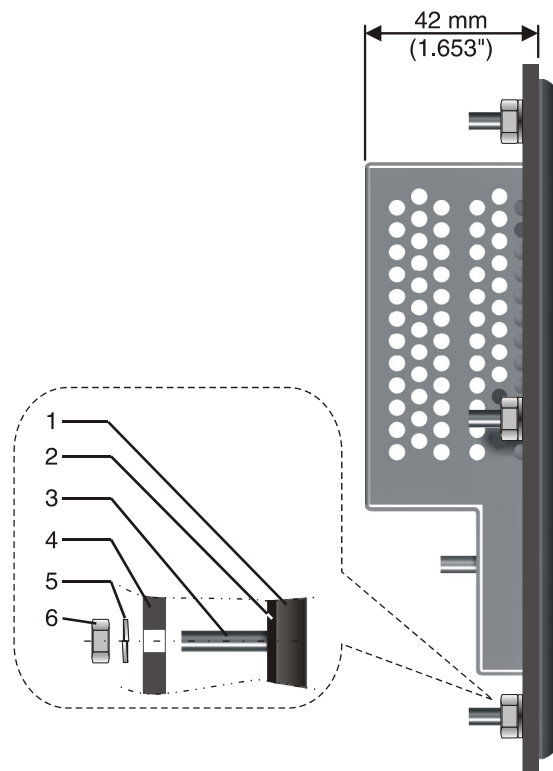


Figure 2-3 TPE057ATQ

- 1 Front Panel
- 2 Circumferential Seal
- 3 Press-in Threaded Bolt M4 x 16 mm (0.629")
- 4 Mounting Surface Thickness 1 mm to 6 mm (0.039" to 0.236")
- 5 Spring Lock Washer B4 DIN 127 Form B (not supplied)
- 6 Nut M4 DIN 934 (not supplied)

2.3 Connecting the Device

2.3.1 Supply Voltage 24 V


The supply voltage is supplied via connector X1.

The device has reverse polarity protection. In case of wrong polarity, the device will not operate.

This is a protection class I device. For safe operation, safety extra-low voltage (SELV) in accordance with DIN EN 61131 must be used for the supply voltage.

Connector in the operating device: 3 pin connector

Table 2-1 Pin assignment supply voltage

Pin	Designation	Function
1		Low-Noise Ground
2	0 V	Supply Voltage 0 V
3	24 VDC	Supply Voltage 24 VDC

A suitable female connector strip is supplied.



NOTICE: Damage

Cables with finely stranded conductors with a minimum cross-section of 0.75 mm² (18 AWG) and a maximum cross-section of 2.5 mm² (14 AWG) must be used for the supply voltage.



DANGER: Hazardous voltages

Hazardous voltages can exist inside electrical installations that can pose a danger to humans. Coming in contact with live parts may result in electric shock!

Use the following procedure to connect the device to the supply voltage:

1. Strip approx. 30 mm (1.181") off the outer cable sheath and approx. 5 mm (0.197") off the wires.

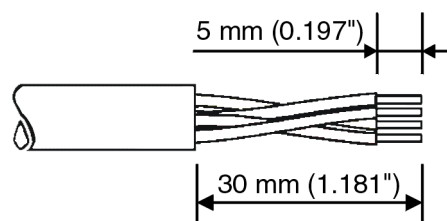


Figure 2-4 Preparing the cable

2. Fit the wires with wire end ferrules and connect the wires to the connector.

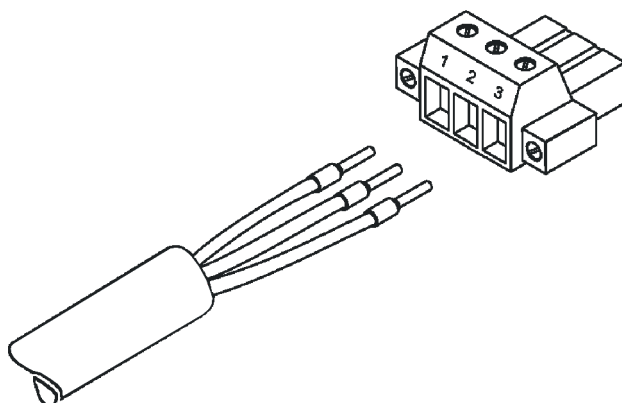


Figure 2-5 Connecting the female connector strip

3. Plug the female connector strip onto connector X1.

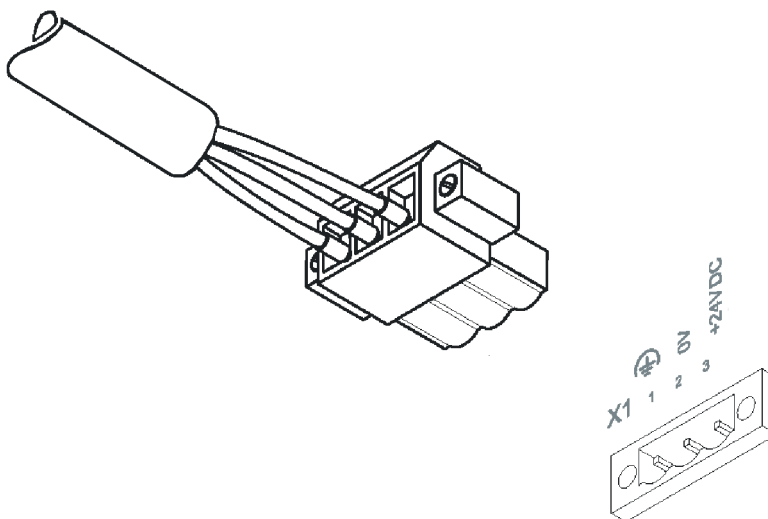


Figure 2-6 Female connector strip is plugged on

4. Secure the female connector strip in place with a screw-type locking to prevent it from slipping out.



NOTICE: Damage

A separate conductor must always be provided for the protective grounding at the threaded bolt. The conductor must have a minimum cross-section of 1.5 mm² (16 AWG) and must be kept as short as possible.

2.4 Switching On

The Windows CE operating system is installed on the operating device. Running on the operating system is the visualization runtime.

2.4.1 Loading Procedure on Windows CE Operating Procedure

The program allows you to use the buttons to make changes to the configuration.

The operating device has 3 operating modes:

- Normal (no button is pressed)
- Setup Main (Button **Press For Setup Main Menu** was pressed)
- Administration (**Admin** button was pressed)

2.4.1.1 Launch Overview

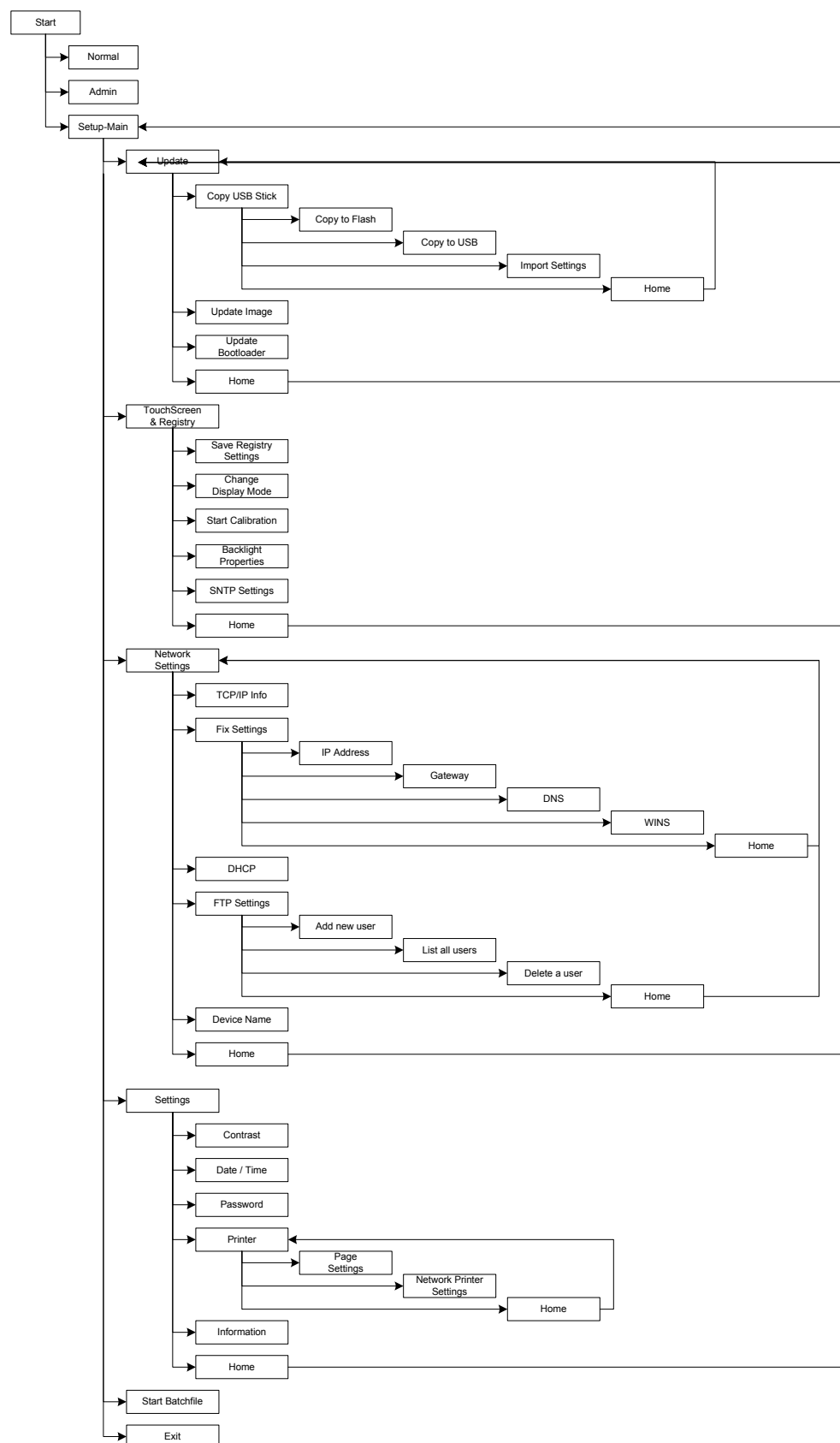


Figure 2-7 Launch overview

2.4.1.2 Normal Mode

The program AppStarter.exe starts from the internal Flash memory.

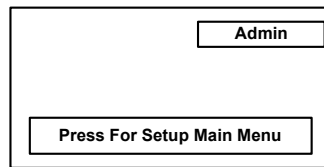


Figure 2-8 Display after startup



Please, note that the device is accessible over the Ethernet only after assignment of an IP address to the Ethernet.

2.4.1.3 Setup Main Mode

If you press the **Press For Setup Main Menu** button during the startup phase, the "Setup Main" mode starts.

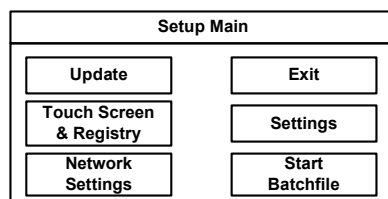


Figure 2-9 Setup Main



Some settings are password-protected. The password is "+--+".

Update:

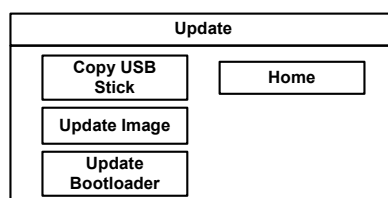


Figure 2-10 Update

Update, Copy USB-Stick:

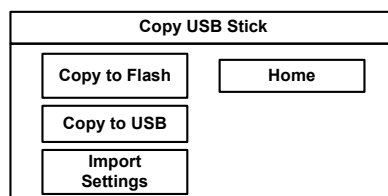


Figure 2-11 Copy USB Stick

Update, Copy USB-Stick, Copy to Flash:

This function copies the data from the USB stick to the internal flash file system.

Several projects can be managed in subdirectories below the directory TSvisRT. If more than one project is in different subdirectories, a choice dialog is displayed. Only directories which contain a project file (*.cb) are listed.

The entire TSvisRT directory or the corresponding subdirectory and the AppStarter.exe are copied into the target directory of the flash file system.

Update, Copy USB Stick, Copy to USB:

Copies the content of the flash file system to the „backup“ directory of the USB stick. This excludes protected system files. A log file is also transferred, which can be used to restore system settings via the „Import Settings“ item.

Update, Copy USB Stick, Import Settings:

An automatically generated log file can be used to restore the system settings. If the „backup“ directory of the USB stick contains a corresponding log file, these settings can be restored.

This is possible only when using identical device types.

Update, Update Image:

If the „image“ subdirectory on the USB stick contains a „*.nb0“ file, this file is used to perform the image update. There must only be one „*.nb0“ file in this directory. In this case, the flash registry is always deactivated so that the image is processed with a new default registry.

Update, Update Bootloader:

If the „bootloader“ subdirectory on the USB stick contains a „*.nb0“ file, this file is used to perform the bootloader update. There must only be one „*.nb0“ file in this directory.

The user is informed that the update has been successfully completed.

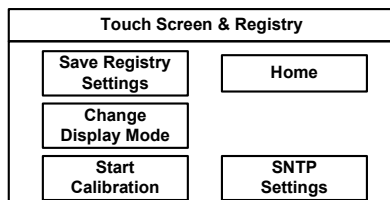
Touch Screen & Registry:

Figure 2-12 Touch Screen & Registry

Touch Screen & Registry, Save Registry Settings:

The entire registry is saved.

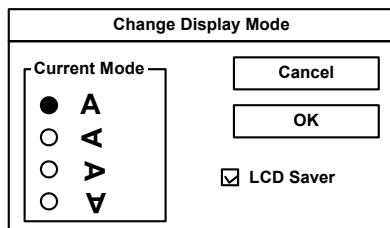
Touch Screen & Registry, Change Display Mode:

Figure 2-13 Change Display Mode

Set-up of display adjustment.

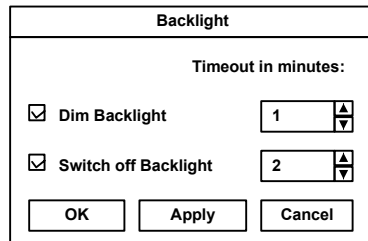
LCD Saver switches the brightness to the lowest value, if no user operation occurs for at least one hour.

This entry is able to be password-protected.

Touch Screen & Registry, Start Calibration:

The touch calibration is started. After the calibration the values are stored automatically in the registry.

Touch Screen & Registry, Backlight Properties:



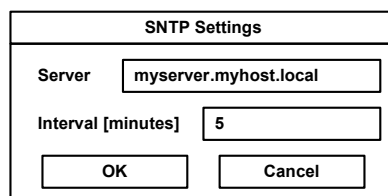
The Backlight Properties dialog box has a title bar 'Backlight'. Inside, there is a label 'Timeout in minutes:'. Below this, there are two checked checkboxes: 'Dim Backlight' and 'Switch off Backlight'. Each checkbox is followed by a numeric input field and a spin button. The 'Dim Backlight' field contains the value '1', and the 'Switch off Backlight' field contains the value '2'. At the bottom of the dialog are three buttons: 'OK', 'Apply', and 'Cancel'.

Figure 2-14 Backlight Properties

The brightness of the backlight can be reduced after the defined time (minutes) and turned off in addition.

This entry is able to be password-protected.

Touch Screen & Registry, SNTP Settings:



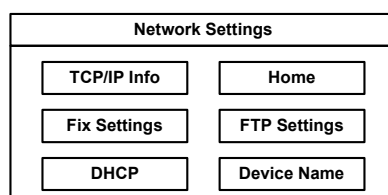
The SNTP Settings dialog box has a title bar 'SNTP Settings'. Inside, there is a 'Server' label followed by a text input field containing 'myserver.myhost.local'. Below this is an 'Interval [minutes]' label followed by a text input field containing '5'. At the bottom are two buttons: 'OK' and 'Cancel'.

Figure 2-15 Registry, SNTP Settings

You can enter the address of a time server located in the intranet or Internet. The synchronization interval is specified in minutes.

This entry is able to be password-protected.

Network Settings:



The Network Settings dialog box has a title bar 'Network Settings'. Inside, there are six buttons arranged in a 3x2 grid: 'TCP/IP Info', 'Home', 'Fix Settings', 'FTP Settings', 'DHCP', and 'Device Name'.

Figure 2-16 Network Settings

Network Settings, TCP/IP Info:

TCP/IP Info	
MAC:	0-7-93-FF-FF-CE
IP:	192.168.100.82
Mask:	255.255.255.0
Device Name:	MyName
DHCP	enabled
Gate:	000.000.000.000
1. DNS:	000.000.000.000
2. DNS:	000.000.000.000
1. WINS:	000.000.000.000
2. WINS:	000.000.000.000
OK	

Figure 2-17 TCP/IP Info

The following informations are displayed:

- MAC address
- IP address,
- Subnet mask address,
- Device name,
- DHCP status,
- Gateway address,
- 1. DNS address,
- 2. DNS address,
- 1. WINS address,
- 2. WINS address.

Network Settings, Fix Settings, IP Address:

IP Address	
IP Address	<input type="text" value="000.000.000.000"/>
Subnet Mask	<input type="text" value="000.000.000.000"/>
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Figure 2-18 IP Address

The system automatically deselects DHCP and optionally enters the settings from the IPSetting.ini file of the USB stick. This file must exist in the root directory of the USB stick.

If no USB stick is connected the information is read from the registry.

This entry is able to be password-protected.

Contents of the IPSetting.ini file:

```
[IPCONFIG]
IPAddress=172.016.042.150
SubnetMask=255.255.255.000
```



All addresses have to be entered in the format "xxx.xxx.xxx.xxx".
Numbers smaller than 100 have to be filled up with leading zeros.
(e.g.: 192.168.42.1 -> 192.168.042.001).

Network Settings, Fix Settings, Gateway:

Gateway	
Change Default Gateway	
<input type="text" value="000.000.000.000"/>	
<input type="button" value="OK"/>	<input type="button" value="Cancel"/>

Figure 2-19 Gateway

The system automatically deselects DHCP and optionally enters the settings from the IPSetting.ini file of the USB stick. This file must exist in the root directory of the USB stick.

If no USB stick is connected the information is read from the registry.

This entry is able to be password-protected.

Contents of the IPSetting.ini file:

```
[IPCONFIG]
Gateway=172.016.042.150
```



All addresses have to be entered in the format "xxx.xxx.xxx.xxx". Numbers smaller than 100 have to be filled up with leading zeros. (e.g.: 192.168.42.1 -> 192.168.042.001).

Network Settings, Fix Settings, DNS:

DNS	
Primary DNS	<input type="text" value="000.000.000.000"/>
Secondary DNS	<input type="text" value="000.000.000.000"/>
<input type="button" value="OK"/>	<input type="button" value="Cancel"/>

Figure 2-20 DNS

The system deselects DHCP and enters the settings from the IPSetting.ini file of the USB stick. This file must exist in the root directory of the USB stick.

If no USB stick is connected the information is read from the registry.

This entry is able to be password-protected.

Contents of the IPSetting.ini file:

```
[IPCONFIG]
PrimaryDNS=172.016.042.150
SecondaryDNS=172.016.042.151
```



All addresses have to be entered in the format "xxx.xxx.xxx.xxx". Numbers smaller than 100 have to be filled up with leading zeros. (e.g.: 192.168.42.1 -> 192.168.042.001).

Network Settings, Fix Settings, WINS:

Figure 2-21 WINS

The system automatically deselects DHCP and optionally enters the settings from the IPSetting.ini file of the USB stick. This file must exist in the root directory of the USB stick.

If no USB stick is connected the information is read from the registry.

This entry is able to be password-protected.

Contents of the IPSetting.ini file:

```
[IPCONFIG]
PrimaryWINS=172.016.042.150
SecondaryWINS=172.016.042.151
```



All addresses have to be entered in the format "xxx.xxx.xxx.xxx".
Numbers smaller than 100 have to be filled up with leading zeros.
(e.g.: 192.168.42.1 -> 192.168.042.001).

Network Settings, DHCP:

Figure 2-22 DHCP

You may enable DHCP service. You must save this setting when exiting of by using „Save Registry Settings“.

This entry is able to be password-protected.

Network Settings, FTP Settings, Add new user:

Figure 2-23 Add new user

You may enter a new user name. You have to assign a password to the user name and to confirm it.

If at least one user name is added you cannot login to the FTP server as anonymous anymore.

Network Settings, FTP Settings, List all users:

All users are listed within a DOS box.

Network Settings, FTP Settings, Delete a user:

Delete a user	
Enter User	<input type="text" value="MyName"/>
Enter Password	<input type="password" value="****"/>
Confirm Password	<input type="password" value="****"/>
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Figure 2-24 Delete a user

You may enter the user name you like to delete.

This entry is able to be password-protected.

Network Settings, Device Name:

Device name
Enter Device Name
<input type="text" value="MyDeviceName"/>
<input type="button" value="OK"/> <input type="button" value="Cancel"/>

Figure 2-25 Device Name

You can define a device name with up to 14 characters. Via a FTP connection you can access the device with the device name instead of the IP address.

This entry is able to be password-protected.

Settings:

Settings	
<input type="button" value="Contrast"/>	<input type="button" value="Home"/>
<input type="button" value="Date / Time"/>	<input type="button" value="Printer"/>
<input type="button" value="Password"/>	<input type="button" value="Information"/>

Figure 2-26 Settings

Settings, Contrast:

Contrast

Contrast

15

▲

▼

Brightness

15

▲

▼

Color Depth

☒ 8 bpp

☐ 16 bpp

OK

Apply

Cancel

Figure 2-27 Contrast

The operating mode setup main is displayed with default values for contrast and brightness to ensure reading also at faulty values. If you change a value, you have to confirm this in a dialog. If you press **Cancel** or 5 seconds pass without any action the value is not accepted.
Depending on the display type different values can be influenced:

Table 2-2

Display Type	Contrast	Brightness
STN (mono)	X	-
STN (color)	X	X
TFT	-	X

Selection of color depth for TFT displays.
This entry is able to be password-protected.

Settings, Date / Time:

Date / Time

◀

▶

Current Time

15:00:00 AM

▲

▼

Time Zone

(GMT +01:00) Amsterdam, Berlin, Bern, Rome ▼

☒ Automatically adjust clock for daylight saving

OK

X

Apply

Figure 2-28 Date / Time

Set the date, time and time zone.

Settings, Password:

The screenshot shows a dialog box titled "Password". Inside, there is a label "Current Password" above a text input field. Below the input field is a checked checkbox labeled "Enable Password". Underneath the checkbox is a "Change" button. At the bottom of the dialog are "OK" and "Cancel" buttons.

Figure 2-29 Password

The password can be activated, deactivated or redefined. When the password is activated, all password-protected dialog boxes can only be accessed if the password has been entered successfully.

This entry is able to be password-protected.

Settings, Printer:

The screenshot shows a dialog box titled "Printer". It contains two buttons side-by-side: "Page Settings" and "Network Print". Below these two buttons is a "Home" button.

Figure 2-30 Printer

Branching to „Page Settings“ and „Network Print“.

This entry is able to be password-protected.

Settings, Printer, Page Settings:

The screenshot shows a dialog box titled "Page Settings". It contains a label "Page Settings:" followed by two radio button options: "Letter" (which is selected) and "A4". At the bottom are "OK" and "Cancel" buttons.

Figure 2-31 Page Settings

Select the paper format, "Letter" or "A4", "Letter" is default.

This entry is automatically stored in the registry.

Settings, Printer, Network Print:

The screenshot shows a dialog box titled "Network Print". It contains a label "Network Printer Path:" above a text input field. Below the input field is a "Network Server Login" button. At the bottom are "OK" and "Cancel" buttons.

Figure 2-32 Network Print

Enter the network printer path.

This entry is automatically stored in the registry.

Settings, Printer, Network Print, Network Server Login:

Network Server Login	
User Name:	<input type="text"/>
Password:	<input type="password"/>
Domain:	<input type="text"/>
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Figure 2-33 Network Server Login

You may perform a network login.

Enter a user name, password and domain.

This entry is automatically stored in the registry.

Settings, Information:

Information
SNR: 1023456789 Image_Grafikpanel_EP9307_CE5.00_V1.18 Built: Aug 27 2007 14:00:00 Flash Size: 16 MB SRAM Size: 512 kB PLC / VISU RAM: 0 / 460 kB Busclock: 49 MHz Click OK to go back to main

Figure 2-34 Information

The following informations are displayed:

- Serial number,
- Product ID,
- Image version,
- Built version,
- Built date,
- Size of flash,
- Size of SRAM,
- Size of PLC / Visu RAM,
- Bus clock speed.

Start Batchfile:

The **project.bat** file in the **FlashDrv** directory starts, if available.

2.4.1.4 Administration Operating Mode

If you press the **Admin** button during the startup phase, the Administration mode of operation starts.

You can use the Admin.ini file to manage the device. This file must exist in the root directory of the USB stick.

This file is used as a dongle to prevent users from changing the device during normal operation.

Possible contents for the Admin.ini file:



Observe upper and lower case for all entries!

Explorer=Off	Deactivates the Explorer in the registry. The change becomes effective on the next device reboot.
Explorer=On	Activates the Explorer in the registry. The change becomes effective on the next device reboot.
Start=explorer.exe	Starts the explorer
Start=MyProgram.exe	Starts the application MyProgram.exe Initial directory is windows. Use the following syntax to start an application on the usb stick: Start=\\\\HardDisk\\MyProgram.exe Use multiple entries to start several applications.
Registry=Default	Destroys the current registry and activates the default registry of the image. The change becomes effective on the next device reboot.
StartRepllog=On	Enables automatic startup of the Repllog.exe program in the registry. The change becomes effective on the next device reboot.
StartRepllog=Off	Disables automatic startup of the Repllog.exe program in the registry. The change becomes effective on the next device reboot.
LaunchTouch=On	The touch variant of the launch will start at devices with keyboard. The change becomes effective on the next device reboot.
LaunchTouch=Off	The standard variant for the device will start. The change becomes effective on the next device reboot.
Lock=On	The buttons Press for Setup Main Menu and Admin are disabled. If the file „Admin.ini“ is found on the usb stick the button Admin is enabled. Therefore the deactivation of the lock is possible. The change becomes effective on the next device reboot.
Lock=Off	All buttons enabled. The change becomes effective on the next device reboot.
Mode=Development	The shell has full functionality. The change becomes effective on the next device reboot.

Mode=Standard	The Shell is restricted: No task bar and task switch available. Desktop contains the launch icon only. The change becomes effective on the next device reboot.
DeviceName=MyName	Defines the device name of the operating device
;DeviceName=MyName	Comment, no impact

2.4.2 Important Files and Update

Table 2-3 Important files and update

File	Storage location	Update	Function
*.nb0	Subdirectory Bootloader	Menu item "Update Bootloader" in operating mode setup main via USB stick	Windows CE Bootloader
*.nb0	Subdirectory Image	Menu item "Update Image" in operating mode setup main via USB stick	Operating system Windows CE
AppStarter.EXE	Root directory on USB stick	Menu item "Copy USB Stick" in operating mode setup main via USB stick	Starts starter.bat
Admin.INI	Root directory on USB stick	-	File with administration settings
IPSetting.INI	Root directory on USB stick	-	File with settings for IP assignment
starter.bat	Root directory on FlashDrv	-	Starts a user-defined application on startup
project.bat	Root directory on FlashDrv	-	Starts a user-defined application from within the launcher

2.5 Identification

The operating device can be identified using the nameplate on the rear of the device.

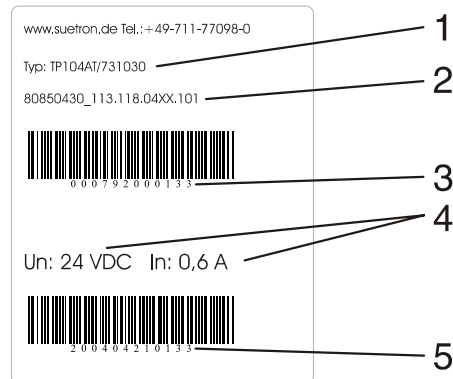
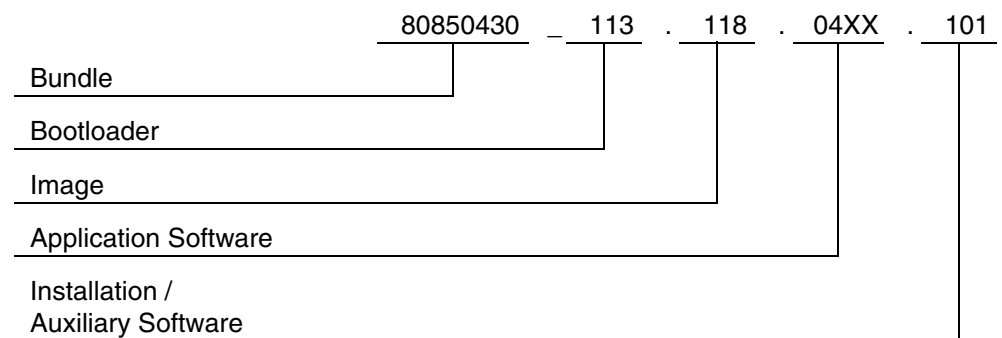


Figure 2-35 Nameplate (example)

- 1 Order number
- 2 Version key (at time of delivery)
- 3 MAC address
- 4 Voltage and power specification
- 5 Serial number

2.5.1 Version Key

The version key provides information on the version level of various components at time of delivery.



3 Control and Display Elements

3.1 Display

**DANGER: Toxic**

If the display is damaged, avoid touching, swallowing or breathing in the liquids or gases which may leak out!

**DANGER: Corrosive**

If the display is damaged, avoid touching, swallowing or breathing in the liquids or gases which may leak out!

3.1.1 Touch Screen

The device is equipped with a resistive 4 wire touch screen. You operate the device using this touch screen.

4 Interfaces of the Device

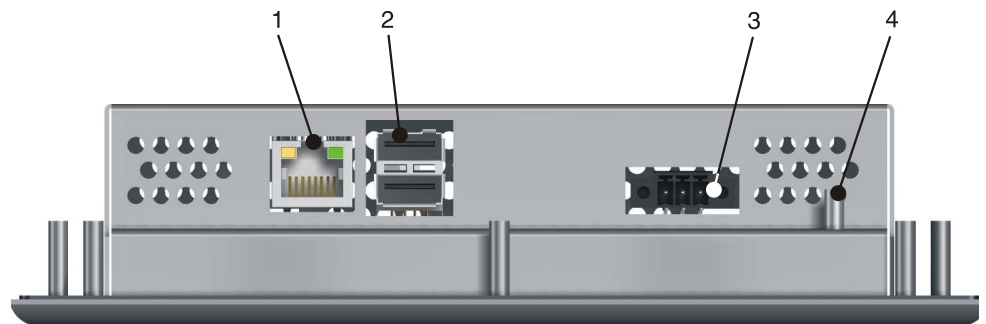


Figure 4-1 Rear view

- 1 Female Connector X5 (Ethernet)
- 2 Female Connector X9, X10 (USB Host - Type A)
- 3 Female Connector X7 (RS422/RS485) - optional
- 4 Termination Switch (X7) - optional
- 5 Connector X1 (Supply Voltage)
- 6 Threaded Bolt For Protective Grounding

4.1 Ethernet (X5)

A 10/100 Base-T Ethernet interface is located on the side of the operating device.

4.1.1 Pin Assignment

Connector in the operating device: RJ45 female connector.

Table 4-1 Assignment of the Ethernet interface

Pin	Designation	Function
1	Tx+	Transmitted Data, Positive Polarity
2	Tx-	Transmitted Data, Negative Polarity
3	Rx+	Received Data, Positive Polarity
4	n.c.	Not Connected
5	n.c.	Not Connected
6	Rx-	Received Data, Negative Polarity
7	n.c.	Not Connected
8	n.c.	Not Connected

4.1.2 Cable



NOTICE

A twisted pair cable of the category 5 (CAT 5) type must be used. The maximum cable length is 100 m (328.084 feet).



See the IEEE 802.3 standard for further information.

4.1.3 Diagnostics

Ethernet diagnostics LEDs are located at the side of the operating device.

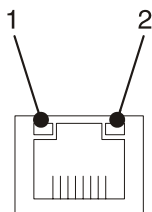


Figure 4-2 Position of the ethernet diagnostics LEDs

Table 4-2 Function of the ethernet diagnostics LEDs

No.	Color	State	Designation	Function
1	Green	ON	XMT	Sending ethernet data telegram
2	Yellow	ON	RCV	Receiving ethernet data telegram

4.2 USB (X9, X10)

Two host interfaces are available on the operating device.



NOTICE

Using input devices not suitable for industrial use (e.g. keyboard, mouse) may decrease safety of operation. This includes input devices intended for home and office use.



NOTICE: Damage

The use of this interface is permitted only within the temperature range of - 20 °C to + 55 °C (- 4 °F to + 131 °F).

4.2.1 Cable



For the specification of a suitable cable, please refer to the „Universal Serial Bus Specification Rev. 2.0“.



NOTICE

The maximum cable length for the cable used is 2.5 m (8.202 feet).

5 Maintenance and Servicing

5.1 Front Panel

Only use a damp cloth to remove any dirt from the front panel.

5.2 Fuse

**NOTICE: Damage**

The semiconductor fuse cannot be replaced!

A semiconductor fuse is used to protect the device. Once the fuse has been tripped, the device must be disconnected from the supply voltage to allow the semiconductor fuse to regenerate. At an ambient temperature of 20 °C (68 °F), the regeneration takes approximately 20 seconds. The higher the ambient temperature, the longer the regeneration takes.

6 Technical Data

6.1 Generally

Touch Screen	
Type	Low Reflective GFG (glass film glass), analog resistive, 4 wire technology
Activation force	Input area A (area within 20 mm, circulating): Minimum / maximum: 0,3 N / 1,5 N Average: 0,9 N Input area B (marginal area of 20 mm, circulating): Minimum / maximum: 0,5 N / 2,5 N Average: 1,2 N With R8 silicon rubber
Durability	No damages or malfunctions after 10 million keystrokes as the following: Keystroke element: R8 silicon rubber Keystroke load: 250 g Keystroke frequency: 2 Hz

Ethernet	
X5 Ethernet	10/100 Base-T

USB	
Corresponds to the „Universal serial bus specification Rev. 2.0“	
Temperature range	- 20 °C to + 55 °C (- 4 °F to + 131 °F)
X9, X10 Host	Min.: 1.5 Mbit/s Max.: 12 Mbit/s Max. output current 100 mA per output

Central Processing Unit	
Central processing unit	RISC ARM9
Clock frequency	184 MHz
Other features	Watchdog timer

Memory	
Flash	64 MByte
SDRAM	128 MByte
NVSRAM	512 KByte

Connection System	
Female and male connector strips Phoenix MINI-COMBICON, 3 pin	
RJ45 female connector	
USB female connector A	

Environmental Conditions	
Temperature during operation	- 20 °C to + 70 °C (- 4 °F to + 158 °F)
Temperature during storage, transport	- 30 °C to + 80 °C (- 22 °F to + 176 °F)
Relative air humidity for operation and storage	Front: 5 % to 95 %, no condensation Rear: 20 % to 85 %, no condensation
Operating altitude (above sea level)	0 m to 4000 m
Application area	Degree of pollution 1, overvoltage category II

Standards and Guidelines	
Interference immunity	DIN EN 61000-4-2 DIN EN 61000-4-3 DIN EN 61000-4-4 DIN EN 61000-4-5 DIN EN 61000-4-6 DIN EN 61000-6-2
Emitted interference	DIN EN 55011 limit value class B DIN EN 61000-6-4
Equipment requirements	DIN EN 61131-2
Storage and transportation	DIN EN 61131-2
Power supply	DIN EN 61131-2
Electromagnetic compatibility	2004/108/EG
Degrees of protection	DIN EN 60529
Impact load, shocks	DIN EN 60068-2-27
Sinusoidal vibrations	DIN EN 60068-2-6

Approvals	
CE, UL, cUL	

6.2 TPE057ATQ

Display	
Type	TFT (color)
Resolution (pixels)	320 x 240
Colors	65536
Reading angle (vertical / horizontal)	135° / 150°
Half-life backlighting	40,000 h
Brightness in cd/m ²	400
Display area (H x W) in mm (Inch)	86.4 x 115.2 (3.402 x 4.535)

Electrical Data	
Supply voltage	24 V DC (SELV in accordance with DIN EN 61131)
Residual ripple	10 % maximum
Minimum voltage	18 V
Maximum voltage	30 V
Power consumption (typical at 24 V)	0.2 A
Power consumption (maximum)	0.25 A
Connected load	4.8 W
Fuse	Semiconductor fuse, self-resetting
Protection against polarity reversal	Integrated

Front Panel and Enclosure	
Enclosure	Steel sheet, galvanized
Front panel material	Aluminium, brushed, anodized natural finish
Front panel (H x W x D) in mm (Inch)	153 x 195 x 5 (6.023 x 7.677 x 0.196)
Seal	Flat gasket on the rear
Mounting cutout (H x W) in mm (Inch)	119 x 161 (4.685 x 6.338)
Mounting depth in mm (Inch)	42 (1.653)
Degree of protection	Front: IP65 Rear: IP20
Total weight	About 1100 g

7 Ordering Data

Table 7-1 Accessories

Description	Article No.
USB 2.0 stick 1 GB	81152.100
USB 2.0 stick 2 GB	81152.200
USB 2.0 stick 8 GB	81152.800
Protective foil for touch screen 5,7" (Set with 10 protective foils, scraper and instructions)	81251.056

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