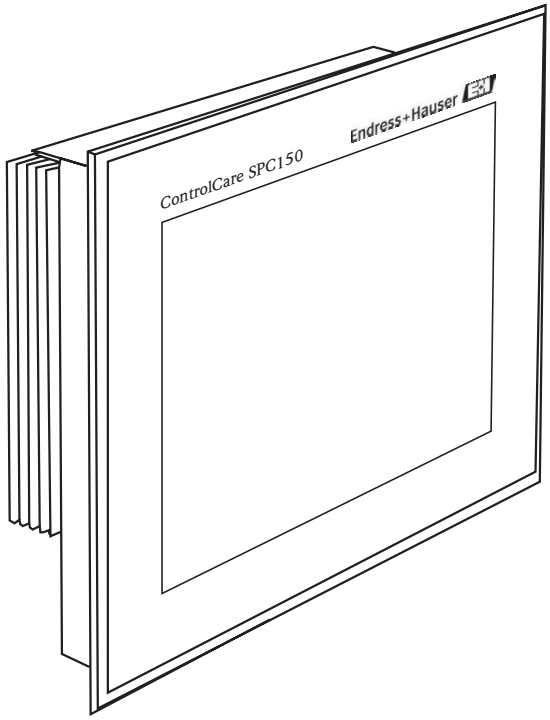
Level Pressure Flow Temperature Liquid Analysis Registration Systems Components Services Solutions

Operating Instructions

ControlCare SPC150

12" Panel PC as P View Web-client



BA045S/04/en/03.06
Version 1.00.xx
70103679

Endress+Hauser
People for Process Automation

Table of Contents

Revision History

Product version	Manual	Changes	Remarks
1.00.xx	BA045S/04/en/03.06	Original	

Registered Trademarks

PROFIBUS®
Registered trademark of the PROFIBUS User Organisation, Karlsruhe Germany.

FOUNDATION™ Fieldbus
Trademark of the Fieldbus Foundation, Austin, TX 78759, USA

HART®
Registered trademark of the HART Communication Foundation, Houston, USA

Microsoft® , Windows® , Windows 2000® ,Windows XP® and the Microsoft logo are registered trademarks of the Microsoft Corporation.

Acrobat Reader® is a registered trade mark of the Adobe Systems Incorporated.

All other brand and product names are trademarks or registered trademarks of the companies and organisations in question

1 Safety

1.1 Designated used

ControlCare Panel PC SPC150 is an industrial computer with integrated 12" touchscreen as well as preinstalled P View Web-client. The Panel PC may be used only as described in this manual and only with the components recommended by Endress+Hauser, which where necessary must have appropriate certification.

1.2 Installation, commissioning and operation

ControlCare Panel PC SPC150 must be installed, connected, operated and maintained according to the instructions in this manual: personnel must be authorised and suitably qualified.

Prerequisites for proper and safe operation of the product are its correct transport, correct storage, installation and mounting as well as careful operation and maintenance.

1.3 Operational safety

Operational environment

ControlCare Panel PC SPC150 fulfils the harmonised, European standards (EN) for the various environments in which is designed to operate. The permissible operating conditions as described in the technical data must be upheld.

Explosion hazardous areas

The device may not be installed in explosion hazardous areas.

Repair

Do not open the device housing. It contains no components that need be maintained or can be repaired by the user. In the event of a fault or defect, return the device to the manufacturer. Opening the device housing invalidates the guarantee.

1.4 Declaration of conformity

CE Mark

ControlCare Panel PC SPC350 fulfils the requirements of the EU Directive 89/336/EEC "Electromagnetic Combatibility" (EMC Directive).

- Interference emmision: EN 50022:1998 Classe A (Product standard ITE)
  EN 50011:1998 Group 1 Classe A (Product standard ISM)
- Interference Immunity: IEC 61000-6-2: 1999
  Interference Immunity: Industrial Environment

CE

A declaration in accordance with the above-mention standards has been issued and can be acquired from Endress+Hauser Process Solutions AG.

1.5 Technical improvement

Endress+Hauser reserves the right to make technical improvements to its software and equipment at any time and without prior notification. Where such improvements have no effect on the operation of the equipment, they are not documentated. If the improvements effect operation, a new version of the operating instructions is normally issued.

1.6 Conventions and icons

In order to highlight safety relevant or alternative operating procedures in the manual, the following conventions have been used, each indicated by a corresponding icon in the margin.

Safety conventions

Icon	Meaning
	A note highlights actions or procedures which, if not performed correctly, may indirectly affect operation or may lead to an instrument response which is not planned
	**Caution!** Caution highlights actions or procedures which, if not performed correctly, may lead to personal injury or incorrect functioning of the instrument
	**Warning!** A warning highlights actions or procedures which, if not performed correctly, will lead to personal injury, a safety hazard or destruction of the instrument

Explosion protection

Icon	Meaning
	**Device certified for use in explosion hazardous area** If the device has this symbol embossed on its name plate it can be installed in an explosion hazardous area in accordance with the specifications in the certificate or in a safe area
	**Explosion hazardous area** Symbol used in drawings to indicate explosion hazardous areas. Devices located in and wiring entering areas with the designation “explosion hazardous areas” must conform with the stated type of protection
	**Safe area (non-explosion hazardous area)** Symbol used in drawings to indicate, if necessary, non-explosion hazardous areas. Devices located in safe areas stiill require a certificate if their outputs run into explosion hazardous areas.

Electrical symbols

Icon	Meaning
	Direct voltage A terminal to which or from which a direct current or voltage may be applied or supplied
	**Alternating voltage** A terminal to which or from which an alternating (sine-wave) current or voltage may be applied or supplied
	**Grounded terminal** A grounded terminal, which as far as the operator is concerned, is already grounded by means of an earth grounding system
	**Protective grounding (earth) terminal** A terminal which must be connected to earth ground prior to making any other connection to the equipment
	**Equipotential connection (earth bonding)** A connection made to the plant grounding system which may be of type e.g. neutral star or equipotential line according to national or company practice

2 Identification

2.1 Unpacking

2.1.1 Visual check

When unpacking:

- Check the packaging of the ControlCare Panel PC SPC150 for visible transport damage
- To avoid damage when unpacking, remove the packing material with care
- Keep the original packing for any further transport of the ControlCare Panel PC SPC150
- Store the accompanying documents in a safe place

If you find that the Panel PC has been damaged in any way, do not put it into operation. In this case, contact your Endress+Hauser Sales Center. Return the device, where possible in the original packing, to us.

2.1.2 Scope of delivery

Before installing the device, please check that the delivery is complete and undamaged. The scope of delivery comprises:

- ControlCare Panel PC SPC150 with preinstalled P View Web-client
- CD-ROM with operating instructions

Options:
- Keyboard with trackball
- Keyboard and mouse

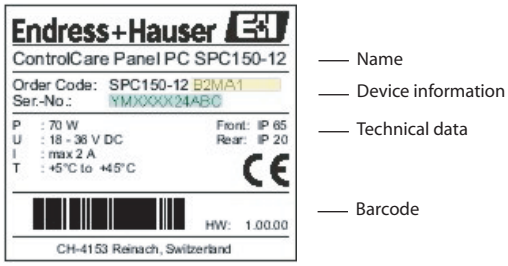
2.1.3 Storage and transport

Although ControlCare Panel PC SPC150 is of robust construction, some of its components are sensitive to heavy vibrations and shocks. For this reason, the ControlCare Panel PC SPC150 must be protected against excessive mechanical loads.

The device may only be transported in its original packing, complete with shock-absorbing components. Make sure that no condensation can form on or within the device when it is transported in cold weather or is subject to extreme temperature differences.

2.2 Device name

The device name and order code are to be found on the nameplate, which is located at the rear of the housing.



The device type can be derived from the product code by using the table below:

SPC150 ControlCare Panel PC as P View Web-Client						
	Monitor					
	12	12"				
		Memory extension				
		A	256 MB			
		B	512 MB			
			Compact Flash			
			1	512 MB		
			2	1024 MB		
				Keyboard		
				A	No keyboard	
				C	Compact keyboard with trackball	
				M	Keyboard with optical mouse	
					Hardware extension	
					A	None
						Options
						1 None
SPC150						

3 Function and System Design

3.1 Function

ControlCare SPC150 is an industrial PC with preinstalled operating system, Internet Explorer and P View Web-client. It is supplied as part of a packaged solution that also includes a P View SCADA application installed on a second computer.

The P View SCADA application acquires process data from the system network via OPC server. The data is then visualized in various HMI pages that are designed according to customer specifications. Since P View supports a client-server architecture, the HMI pages can be viewed in every P View client connected to the system.

The P View Web-client and the P View server communicate via Ethernet in Intranet/Internet, which can be protected with firewalls or other safety mechanisms. This allows safe, local and worldwide access to the HMI pages of the P View server. The connection is established by entering the P View server URL in Internet Explorer - just as in Internet.

Depending upon user requirements, the P View client is automatically started and the connection to the server established when the Panel PC is switched on. It is also possible to select the HMI pages that are to be displayed at a particular client. Operation and navigation is via the touchscreen.

3.2 System design

Fig. 3-1 shows a monitoring system with the 19" ControlCare Panel PC acting as P View server. Process values are collected from the system and made available to the P View Web-clients running in the ControlCare Panel PC SPC150. The Web-client can be installed in an internal or external network.

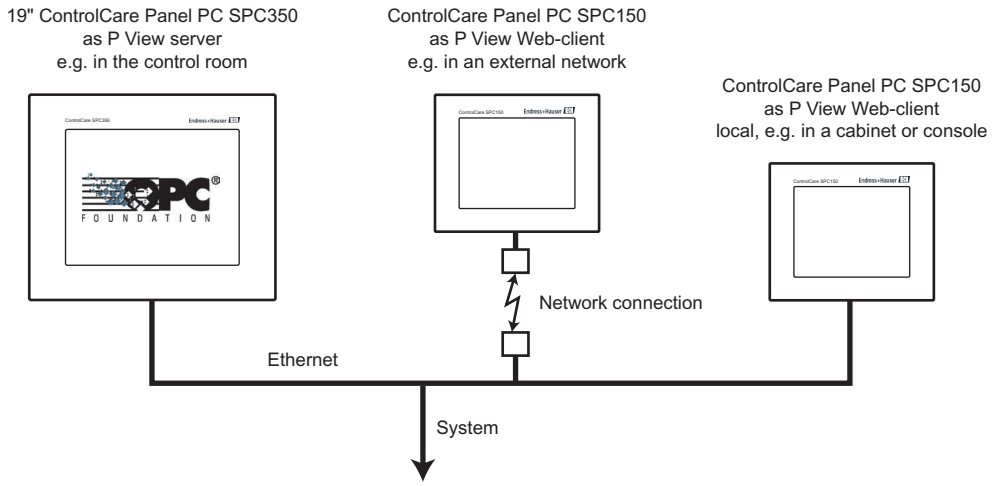


Fig. 3-1: Example for system design with P View Web-server und Web-client

4 Mechanical Installation

4.1 Location

ControlCare Panel PCs are designed for use in industrial environments and can be mounted in racks, cabinets, cabinet doors, consoles or control panels. They are approved for use in closed rooms. When installing, please observe the specifications in Chapter 8, Technical Data.

4.1.1 Temperature

The Panel PC may not be subjected to direct sunlight or other source of light.

Before installing or commissioning:

- Allow the device enough time to adapt to room temperature.
- If there is any danger of condensation, make sure that the device is absolutely dry before switching it on.

4.1.2 Ventilation

The temperature of the surrounding air during operation may not exceed +45°C (110°F). It is important that the device does not overheat during operation.

- Ventilation slits at the top and bottom of the housing allow air to circulate and cool the device during operation. Ensure that these slits are always free.
- Ensure that there is sufficient volume for the exchange of air within cabinets or consoles. The clearance around the sides of the Panel PC must be min. 50 mm (2"), at the back min. 20 mm (0.8").
- In the case of closed industrial housings, care should be taken that the air inside can circulate.

Note!
- In order to ensure proper ventilation in closed industrial housings, a ventilator kit, which is mounted on the back of the housing, can be offered as an option.
- If the Panel PC is not mounted vertically, care must be taken that air can circulate properly via the ventilation slits.

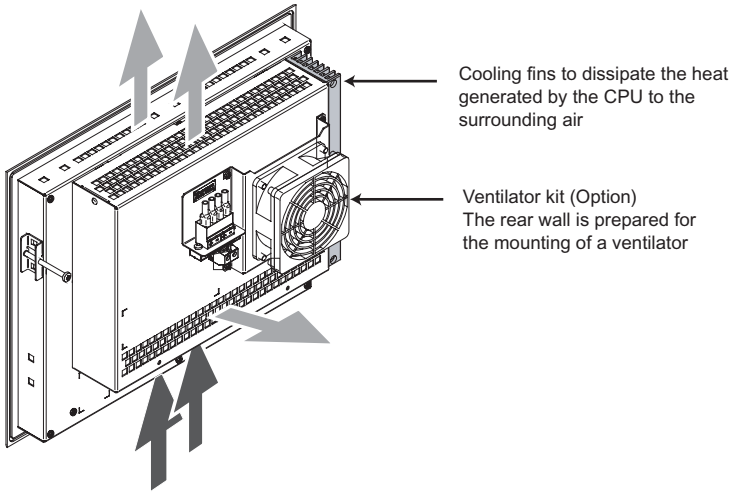


Fig. 4-1: Ventilation

4.1.3 Cut-out

The cut-out for installation should be selected such that it is stabilized by the bracing in the cabinet or panel. If necessary, bracing must be installed.

- Degree of protection IP 65 is attained only for plate thickness of 2 mm (0.1") or greater.
- It must also be insured that the panel is correctly installed by skilled personnel using the screw clamps provided and that the rubber gasket is properly seated.
- Check that there is enough clearance to remove the panel from the cut-out.

Fig. 4-2 shows the dimensions in mm (in) for the cut-out

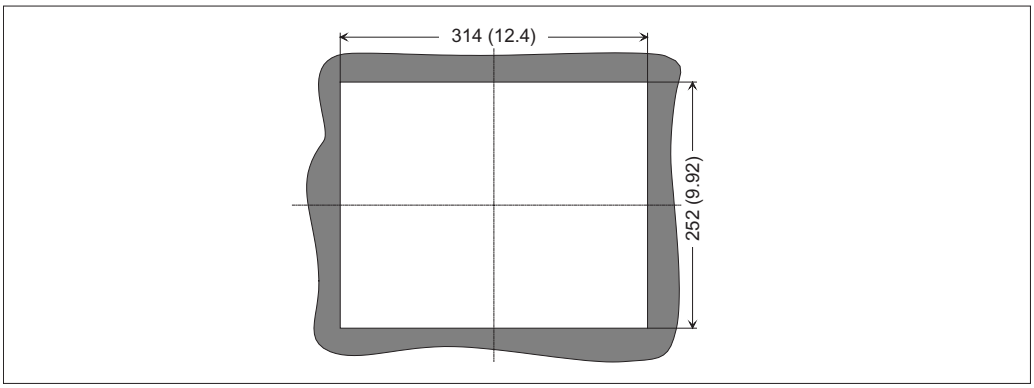


Fig. 4-2: Dimensions in mm (in) for the cut-out

4.1.4 Fastening and sealing

Screw clamps are used to fasten the Panel PC in the cut-out. They are seated in the openings provided for them in the housing.

- Insert the ControlCare Panel PC SPC150 into the cut-out and hold in position.
- Seat the screw clamps in the openings provided for them.
- Fasten the Panel PC in the cut-out by tightening the screws.

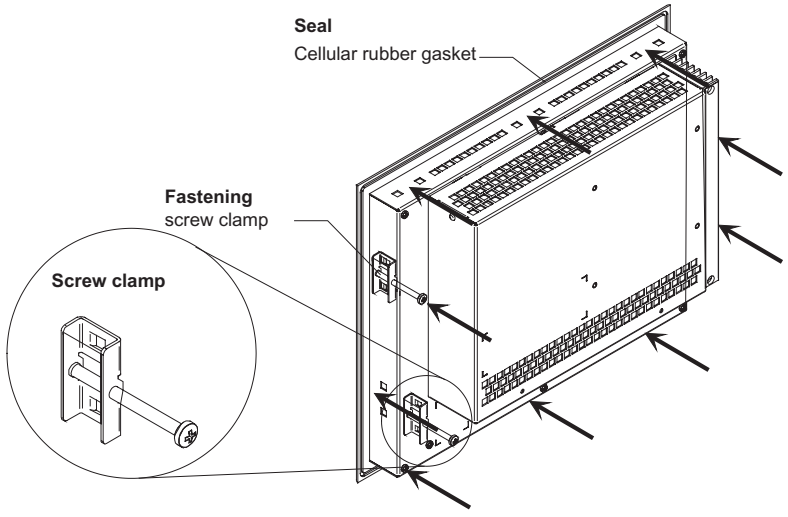


Fig. 4-3: Fastening and sealing

5 Electrical Installation

ControlCare Panel PC SPC150 is an "IT system" in accordance with EN 60950, with supply voltage of 24 VDC.

5.1 General precautions

Connections for interference free operation:

- The EMC approval requires that signal connections are made with shielded cables and metal connectors only.
- To ensure optimal electrical shielding, all plugged connections are to be screwed or locked into position.
- Signal cables may not be laid in the same cable trays as power cables.
- Before commissioning the system, check all cable connections.
- Ensure that the permissible values for voltages and signals are upheld.

Safe discharge of electrical disturbances:

- Connect the Panel PC and cabinet by the shortest possible route to a central earth.
- Ensure good electrical connection between Panel PC and cabinet (low-impedance).
- Use an earth connection conductor of minimum 2.5 mm² (0.1 in^2) diameter.

Special precautions for 24 VDC devices:

- The panel PC may be connected to a safety extra low voltage (SELV) circuit only.
- The circuit transformer must fulfil the pertinent standards.

5.2 Power supply

Before connecting up:

- Check that the power supply has the correct voltage.
- Protective earth: Connect the grounding point on the housing to the cabinet earth. A M4x10 grounding point is to be found on the bottom of the housing, see Fig. 5-1.

View from housing side:

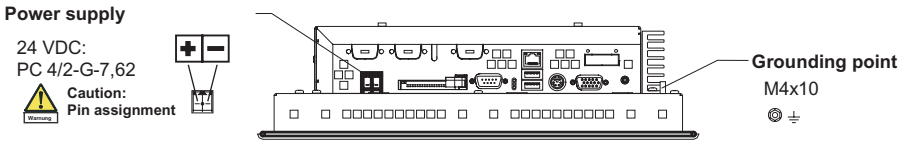


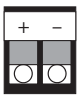
Fig. 5-1: Connection the power supply

5.2.1 24 VDC power supply

ControlCare Panel PC SPC150 requires a 24 VDC (18–36 VDC) power supply. The power supply must fulfil the requirements of a safely extra low voltage (SELV) circuit to EN 60950.

5.2.2 Plug connector

The 24 VDC socket for the plug connector is to be found on the righthand side of the housing.

Socket		**PC 4/2-G-7,62** 2-pole, pitch: 7.62 mm Phoenix Contact
Plug		**PC 4/2-ST-7,62** 2-pole, pitch: 7.62 mm Phoenix Contact

Tab. 5-1: Plug connector for 24 VDC

To prepare the Panel PC for operation:

- Connect a 2-core cable to the plug supplied and insert it into socket in the Panel PC housing. Note the polarity.
- Connect the other end of the cable to a 24 VDC power supply that fulfils the requirements of a safely extra low voltage (SELV) circuit to EN 60950.

5.2.3 Option: ventilator kit

If a ventilator is used, a separate 24 VDC power supply is required.

5.3 Peripherals

ControlCare Panel PC SPC150 offers a number of ports to which peripherals can be connected.

- When using commercial peripherals (USB, PS/2 etc.), it should be noted that their immunity to electromagnetic interference is normally sufficient for an office environment only.
- Commercial peripherals are suitable for use during commissioning and service. If an external mouse and keyboard are required during operation, care should be taken that they have a EMC approval (CE mark) for use in an industrial environment.
- An external keyboard and the touchscreen can be used in parallel.

5.3.1 Access

The ports for peripherals and the external compact flash receptacle are on the bottom of the housing, see Fig. 5-2:

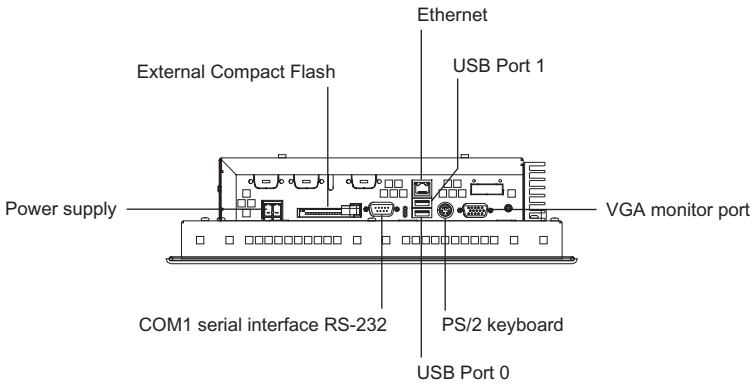


Fig. 5-2: Connections for peripheral devices

5.3.2 Keyboard

Various keyboard types can be connected to the ControlCare Panel PC SPC150:

- PS/2 keyboard
  connected to the PS/2 keyboard socket.
- USB keyboard
  connected to the USB port:
  for first-time use it is usually necessary to install a USB keyboard driver.

5.3.3 Mouse

Various mouse types can be connected to the ControlCare Panel PC SPC150:

- Serial mouse
  connected to the COM1 interface: the corresponding mouse driver must be installed and configured.
- USB mouse
  connected to the USB port:
  for first-time use it is usually necessary to install a USB mouse driver.

5.3.4 Monitor

An external monitor or various other display types can be connected to the VGA interface.

Note
- It is possible that the use of an external monitor cause an loss of touchscreen picture quality.
- We recommend that external monitors are used for service and diagnosis only.

5.3.5 Ethernet network

ControlCare Panel PC SPC150 is connected to an Ethernet network via the RJ-45 socket.

- For computer-computer connections, use a crossed Ethernet cable.
- For computer-switch connections, use a standard Ethernet cable.

5.3.6 Compact flash

Controlcare Panel PC SPC150 is equipped with an internal compact flash card on which the system software is stored.

In order to store user data and programs, an external compact flash card is available as an option. The card receptacle is located at the bottom of the housing and is easily accessible.

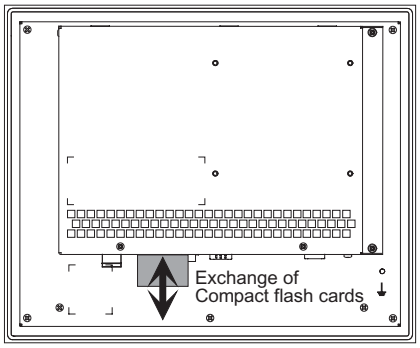


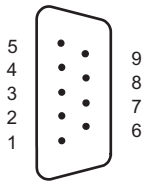
Fig. 5-3: Access to the external compact flash card (option)

Note
- The external card must not be removed during operation.
- Do not "rescue" data to the compact flash card when there is a power failure. A battery-buffered SDRAM is provided for this purpose.
- An unstable power supply may lead to uncontrolled writing to the storage medium and files can be overwritten and lost. In order to prevent data loss, a variable voltage an uninetrruptable power supply should be used.

5.4 External interfaces

5.4.1 Serial port COM1 [RS-232]

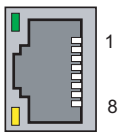
ControlCare Panel PC SPC150 has a serial port (RS-232, V24) with a 9-pin Sub-D male connector labelled "COM 1".

Sub-D male connector 9-pin	Pin	Signal	Description	Input/ Output
	1	DCD	Data Carrier Detect	I
	2	RxD	Receive Data	I
	3	TxD	Transmit Data	O
	4	DTR	Data Terminal Ready	O
	5	GND	Signal Ground	—
	6	DSR	Data Set Ready	I
	7	RTS	Request to Send	O
	8	CTS	Clear to Send	I
	9	RI	Ring Indicator	I

Tab. 5-1: COM1 (RS-232 serial port)

5.4.2 Ethernet ports

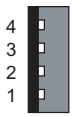
ControlCare Panel PC SPC150 has an Ethernet port with RJ-45 10Base-T female connector labelled "Ethernet". The controller supports transmission rates of 10 MBit/s and 100 MBit/s.

10Base-T RJ-45 CAT5	Pin	Signal	Description	Input/Output
	1	TxD+	10Base-T Transmit	Differential Output
	2	TxD-	10Base-T Transmit	Differential Output
	3	RxD+	10Base-T Receive	Differential Input
	4	N.C.	not connected	—
	5	N.C.	not connectedt	—
	6	RxD-	10Base-T Receive	Differential Input
	7	N.C.	not connected	—
	8	N.C.	not connected	—
		LED green	Link	
		LED yellow	Activity	

Tab. 5-2: Ethernet

5.4.3 USB ports

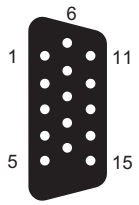
ControlCare Panel PC SPC150 has two Type A 4-pin USB receptacles (double-decker) labelled "USB A" and "USB B",

USB Type A 4-pin	USB A		USB B		Description
	1	VCC	1	VCC	Power (+5V / 0,5A)
	2	USB0-	2	USB1-	Data
	3	USB0+	3	USB1+	Data
	4	GND	4	GND	Ground

Tab. 5-3: USB [double]

5.4.4 VGA port

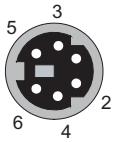
ControlCare Panel PC SPC150 has a 15-pin HD-Sub-D port labelled "VGA".

HD-Sub-D female connector, 15-pin	Pin	Signal	Pin	Signal	Pin	Signal
	1	RED	6	GND	11	N.C.
	2	GREEN	7	GND	12	DDC DAT
	3	BLUE	8	GND	13	HSYNC
	4	N.C.	9	VCC_VGA (+5V)	14	VSYNC
	5	GND	10	GND	15	DDC CLK

Tab. 5-4: VGA [CRT]

5.4.5 PS/2 keyboard port

ControlCare Panel PC SPC150 has a 6-pin MiniDIN port labelled "PS/2 keyb" for the connection of an external PS/2 keyboard.

MiniDIN female connector, 6-pin	Pin	Signal	Description	Input/ Output
	1	KBDAT	Keyboard Data	I/O
	2	N.C.	Not connected	—
	3	GND	Ground	—
	4	VCC-PS/2 (+5V)	Power	O
	5	KBCLK	Keyboard Clock	I/O
	6	N.C.	Not connected	—

Tab. 5-5: PS/2- keyboard

6 Commissioning and Operation

6.1 Start-up

The operating system Microsoft Windows XP Embedded, Microsoft Internet Explorer and the P View Web-client are preinstalled on the ControlCare Panel PC SPC150.

The P View server and Web-clients communicate via Ethernet using Internet Explorer. Depending upon user specifications, the Web-client is started and the connection to the server established automatically when the Panel PC is switched on. Alternatively, the Web-client connection is made, as in Internet, by entering the P View server URL in Internet Explorer.

6.2 Operation

Operation and navigation is done with the touchscreen at the front of the Panel PC. Functions are called and views changed by touching the corresponding buttons and menu bars on the graphical user interface.

The function and operation of the HMI pages is described in an application-specific operating manual that is supplied with the associated P View SCADA application.

Caution

- Do not use metallic or pointed objects to operate the touchscreen - they will damage it.

7 Maintenance

Ventilator, display backlight and battery should be checked for correct function at regular intervals.

7.1 General precautions

Caution

- The housing need only be opened to exchange the back-up battery. If the display backlight needs to be replaced, send the unit back to Endress+Hauser.
- Electronic components are extremely sensitive to electrostatic discharge. For this reason they must be handled with great care. Instructions on handling can be found in the ESD guidelines.

Should you need to remove the housing:

- Switch off the ControlCare Panel PC SPC150 and disconnect it from the power supply.
- Before working on the components, the electrostatic change on your body must be brought to the same level as that of the ControlCare Panel PC SPC150 and its components. To this end, touch the metal housing.
- Do the same for any tools you are using.
- Use a ground strap if you are working with electronic components.
- Do not unpack components and modules until they are really needed.
- Grip components and modules at their edges. Never touch connection pins and condictors.
- Never operate the ControlCare Panel PC SPC150 with open housing.

7.2 Housing

7.2.1 Construction

Fig. 7-1 shows how the housing is constructed:

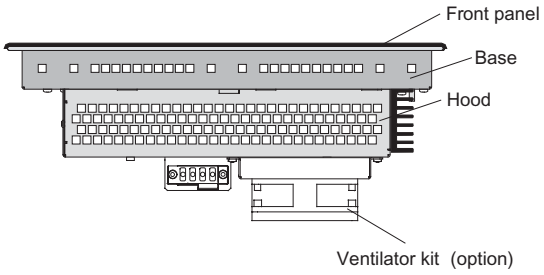


Abb. 7-1: Housing contruction

Base	The base is designed ■ for the installation of the electronics: basic board with associated electronics and possible extensions ■ to fasten the other system components: display, front panel, hood.
Hood	The hood is mounted and fastened from the rear, optionally with ventilator kit.

7.2.2 Opening the housing

Caution
Before opening the housing:
- Shut down the Panel PC.
- Switch off the Panel PC.
- Disconnect it from the power supply.
- Remove all connection cables..

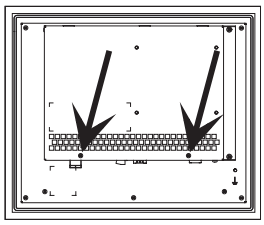
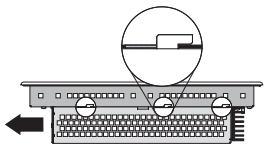
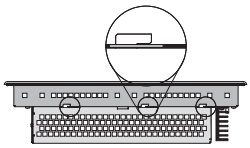
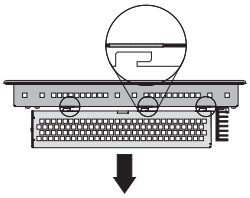
	Loosen the two screws on the back wall of the hood. Phillips screws M3x6
	Slide the hood to the left (as seen from above) in its guide slots...
	until the fixing lugs are free.
	Pull off the hood.

Fig. 7-2: Opening the housing

After the hood has been removed, the basic board with its various (covered) elements are visible.

7.3 Back-up battery

The back-up battery on the basic board supplies current to the Real Time Clock, CMOS memory and SDRAM so that system information can be permanently stored, even when the board is disconnected from the power supply.

Type	CR2032
Electrochemical system	Primary Lithium button cell
Nominal capacity	230 mAh
Nominal voltage	3 V
Diameter	20 mm
Height	3.2 mm
Weight	3 g

7.3.1 Exchanging the battery

If the battery voltage is too low or the battery is empty, the values stored in the CMOS RAM, e.g. date and time, will be incorrect. The Lithium battery must then be changed.

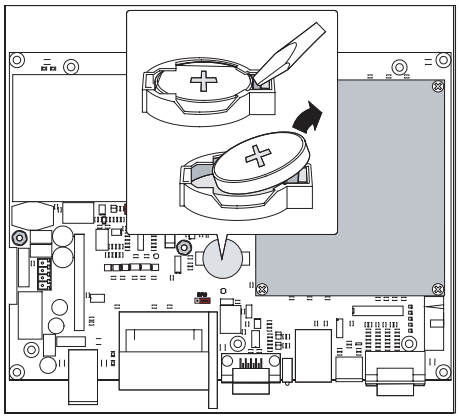


Fig. 7-3: Exchanging the back-up battery

Procedure

1 Observe the general precautions in Chapter 7.1.

2 Open the housing as described in Chapter 7.2.2.

3 Using a medium-size, flat blade screwdriver, carefully lift the battery until it can be released from its socket.

4 Insert the new battery in the socket, such that the "+" mark is at the top, see Fig. 7-3.

5 Remount the housing hood and secure it with the screws.

Caution

- If the exchange is not done as described above there is a risk of explosion.
- The replacement battery must be of identical type or of a type recommended by the manufacturer.
- The lithium battery may not be trown away as domestic refuse. It can be sent back to the manufacturer, the dealer or their agents, so that it can be recycled or properly disposed of.

7.4 Display backlights

The display backlights have a limited useful life. Their life time depends upon the conditions under which they are operated, e.g. on/off cycle times, operating temperature, symmetry of the lamp supply voltage. The times indicated below are typical values taken from the manufacturer's data sheets. We recommend that the backlights are replaced after this time has elapsed.

Property	Operating conditions
Life time of display backlights (MTBF)	min. 50.000 h

When it becomes necessary to exchange the backlights, please contact your Endress+Hauser Service department for more information.

8 Technical Data

8.1 Panel PC specification

General

Attribute	12" ControlCare Panel PC SPC150
CPU	Celeron 400 MHz
Memory	256 MB SDRAM (standard) 512 MB SDRAM (option)
Compact flash card	512 MB (standard) 1024 MB (option)

Display

Attribute	12" ControlCare Panel PC SPC150
Screen size	12.1" diagonal
Type	Active matrix LCD TFT color
Resolution	800 x 600 pixel (SVGA)
Operation	Touchscreen

External interfaces

Attribute	12" ControlCare Panel PC SPC150
Communication	1x serial RS-232C (COM1)
	1x Ethernet 10/100 Base T
Accessories	1x VGA (for external screen)
	1x PS/2 (for keyboard)
	1x CF socket for flash card

Software

Attribute	12" ControlCare Panel PC SPC150
Operating system	Windows XP Embedded
ControlCare P View	Web-Client

Power supply

Attribute	12" ControlCare Panel PC SPC150
Power supply	18...36 VDC (SELV)
Power consumption	Max. 70 W

8.2 Operating conditions

Mechanical

Attribute	12" ControlCare Panel PC SPC150
Degree of protection	Front: IP 65, Rear: IP 20
Vibrational resistance 10 Hz to 58 Hz: 58 Hz to 150 Hz:	to IEC 60068-2-6 ±0.075 mm DA 10 m/s^2
Shock resistance	to IEC 60068-2-7 10g, 11 ms, 3 shocks

Environment

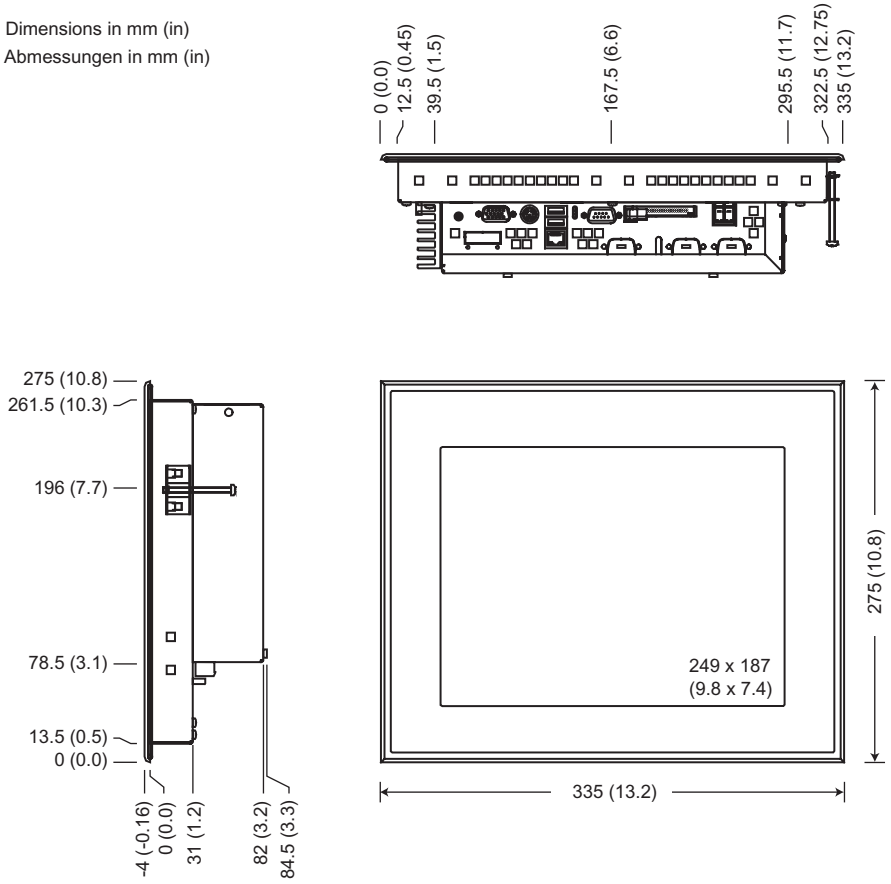
Attribute	12" ControlCare Panel PC SPC150
Ambient temperature Operation: Storage:	with natural convection +5°C to +45°C (vertical) –20°C to +60°C
Relative humidity	max. 50% at +40°C, non-condensing max. 90% at +20°C, non-condensing
Surrounding air	free from corrosive gases
EMC Inteference emission: Interference immunity:	to Directive89/336/EWG EN 55011/EN 55022, limit Class A IEC 61000-6-2: 1999

8.3 Mechanical construction

General

Attribute	12" ControlCare Panel PC SPC150
Mounting	Designed for mounting in panel, cabinet or industrial monitor enclosure
Front panel	Aluminium baseplate with laminated plastic foil
Housing	1 mm galvanized steel plate
Cooling	No cooler
Weight	4.0 kg
Overall dimensions	288mm x 220mm x 85.4mm (11.8" x 8.3" x 3.3"), for details see Page 5

Dimensions



8.4 Certificates and approvals

Approvals

Attribute	12" ControlCare Panel PC SPC150
CE Certificate	EMC conformity
UL Certificate	in preparation

Index

www.endress.com/worldwide

Endress+Hauser

People for Process Automation