

The Afghanistan Engineering Support Program assembled this deliverable. It is an approved, official USAID document. Budget information contained herein is for illustrative purposes. All policy, personal, financial, and procurement sensitive information has been removed. Additional information on the report can be obtained from Firouz Rooyani, Tetra Tech Sr. VP International Operations, (703) 387-2151.

To: [REDACTED], Power Plant Supervisor

From: [REDACTED], P.E., Senior Electrical Engineer

Date: September 8, 2013

Re: WO-A-0093 Technical Assistance to US Embassy Power Plant

Tetra Tech made a site visit to the US Embassy Power plant on Tuesday, August 27, 2013. The Power Plant personnel expressed concern with recent and frequent tripping of a circuit breaker in the Power Plant switchgear lineup.

Executive Summary

After a brief site visit and discussion with the Embassy staff, Tetra Tech analyzed the possible causes of the frequent tripping. From our analysis, faulty PLC programming is the most likely cause of the frequent tripping problem. The PLC programming may be outdated and therefore may be faulty. It is recommended that the Embassy facilities department purchase a device to read and, if necessary, re-program the PLC.

Field Investigation

The site visited was the prime power plant area on the US Embassy campus on the side of the campus south of Massoud Road. The synchronizing switchgear lineup, located in a metal container, and nearby electrical distribution equipment was inspected during this site visit. The problematic circuit breaker was located in the synchronizing switchgear lineup.

The circuit breaker (52) that has been tripping is designated 'O-LB' because it is an output circuit breaker that was originally intended to be connected to a load bank. Apparently there never has been a load bank installed. In the past, when the three Caterpillar generators that normally feed this line-up of switchgear were out of service, three temporary FG Wilson generators were set up to feed power into the switchgear through this circuit breaker. The FG Wilson generators were removed over two years ago and the feeder cables were left un-energized (cold) for most of that time. More recently, this circuit breaker was used to feed a step-up transformer to move generator power from this site to other parts of the US Embassy campus.

A few photographs and a one-line diagram were provided by Embassy staff before the site visit. The one-line diagram was titled 'Single Line Diagram, Panel No. 'BB-1E', Description 'Control and Sync Panel', Date '28.03.04' and was produced by 'MES-SEG'.

The following notes were made during the August 27, 2013 site visit:

1. The three generators are connected to the switchgear bus through Siemens WLII 2500N circuit breakers. Each generator has a NewAge AVK SEG PCM1-G synchronizing controller. Each generator circuit breaker also has a Siemens ETU15B trip unit with adjustable long (L) and instantaneous (I) trip settings. 52-G1 had the 'L' setting of 0.9 chosen and the 'I' setting of 5 chosen at the time of the site visit.
2. The three output circuit breakers, including 'O-LB', are similar Siemens WLII 2500N circuit breakers but do not have any trip units. This is unusual. Without tripping units, the circuit breakers are being used as switches instead of as overload and short circuit protection devices.
3. The switchgear had six circuit breakers, as described above. The one-line diagram sent to me before the field visit showed seven circuit breakers. This, and other variances, put the accuracy and completeness of the one-line diagram into question.
4. A Siemens A61, Simatic S7-300 PLC was mounted in the control cubicles above circuit breaker 'O-LB'. The PLC had a front mounted socket which was later identified as a MPI/DP interface (RS 485, electrically isolated), 9-pin sub-D socket. There is extensive documentation of this device available online at:

<http://www.automation.siemens.com/mcms/programmable-logic-controller/en/simatic-s7-controller/s7-300/pages/default.aspx>.
5. There were six interfacing relays mounted on a DIN rail above the PLC and wired to it. I am assuming that these six relays send auxiliary tripping signals to the six circuit breakers in the switchgear lineup.
6. The PLC wiring appeared to be disorganized. Too many wires were crowded onto a terminal strip that was too small to accommodate them. The wiring did appear though, to be complete. No terminal connections appeared to have been removed.

The following information was obtained by interview with Larry Roach and Sammy Tope:

1. Since there is no trip unit on the problematic circuit breaker 'O-LB', staff assumes that it is tripping on PLC command.
2. There is no known documentation about the PLC programming. The US Embassy staff has no way to interface with the PLC. There is no way to positively determine if the PLC has directed any circuit breaker tripping.

3. Tripping seems to occur when switching synchronized generators. During the transfer of load from one generator to another, during the overlap, the 'O-LB' circuit breaker trips.
4. Switching used to occur more frequently when the step-up transformer was first connected to circuit breaker 'O-LB'. By varying the sequence of load added to this circuit breaker the incidents of tripping have recently decreased.
5. The 400V feeder from 'O-LB' is run in a duct-bank with a spare duct.
6. The document *Embassy of the United States of America, Kabul Afghanistan, Contract No. SGE500-090D-0010, Electrical Coordination Study, Final Submittal, March 25, 2011* was made available.

Analysis

Possible causes of the circuit breaker tripping include:

1. Faulty PLC programming. This is the most likely cause of the frequent tripping problem. The PLC programming appears outdated and therefore may be faulty. Since the switchgear was set up to utilize a load bank and the PLC is likely set up to manage the generator loading using a load bank, the PLC may possibly be programmed to switch a load bank in and out of service to keep the generator loading high.
2. High transformer inrush currents. A transformer typically sees six times its normally rated current for 0.1 seconds. The inrush can vary depending on the transformer impedance and the load but 6X is a typically used value for planning purposes. The upstream circuit breaker needs to be set not to trip during these events. A 2MVA transformer, at 400V, 3 phase, is rated for 2,890 full load amperes (FLA). The inrush current would therefore be 17,341A.
3. Faulty 400V feeder cables. Cables left un-energized and immersed in water tend to allow the water to infiltrate into their insulation jackets. Re-energizing the cable will eventually dry out the insulation but the damage will have already been done. The cable will have a much lower impedance to ground. While this is an unlikely cause for the current problem, testing cable insulation levels and providing spare ducts to facilitate replacement should be a goal of electrical installations that service critical functions.

The circuit breaker is not likely tripping to protect the electrical system because a) it has no tripping elements and b) there is no evidence of overload or short circuits.

The coordination study, dated March 25, 2011 was not germane to the analysis of the problem. The study only concerned itself with electrical equipment on the other, north side of the US Embassy campus on the other side of Massoud Road.

Recommendations

1. Purchase a device to read and re-program the PLC. A description of a Siemens SIMATIC, Programming device, SIMATIC Field PG M3 is attached. I have not priced the device.
2. Collect more data. Embassy staff can draw a more complete one-line diagram of their installation. The synchronizing unit model numbers can be recorded on the one-line. Circuit breaker models and trip units and trip dial settings can also be recorded on the one-line. Cable lengths can be measured and noted on the one-line.
3. Commission a coordination study of the electrical distribution equipment on the US Embassy campus on the south side of Massoud Road. Recommendations to install tripping units on the three output circuit breakers may follow. A determination concerning the circuit breakers to hold the transformer inrush will be determined.

Since the circuit breaker that is tripping does not have a tripping unit this recommendation is not a likely factor to determine the source of the immediate problem.

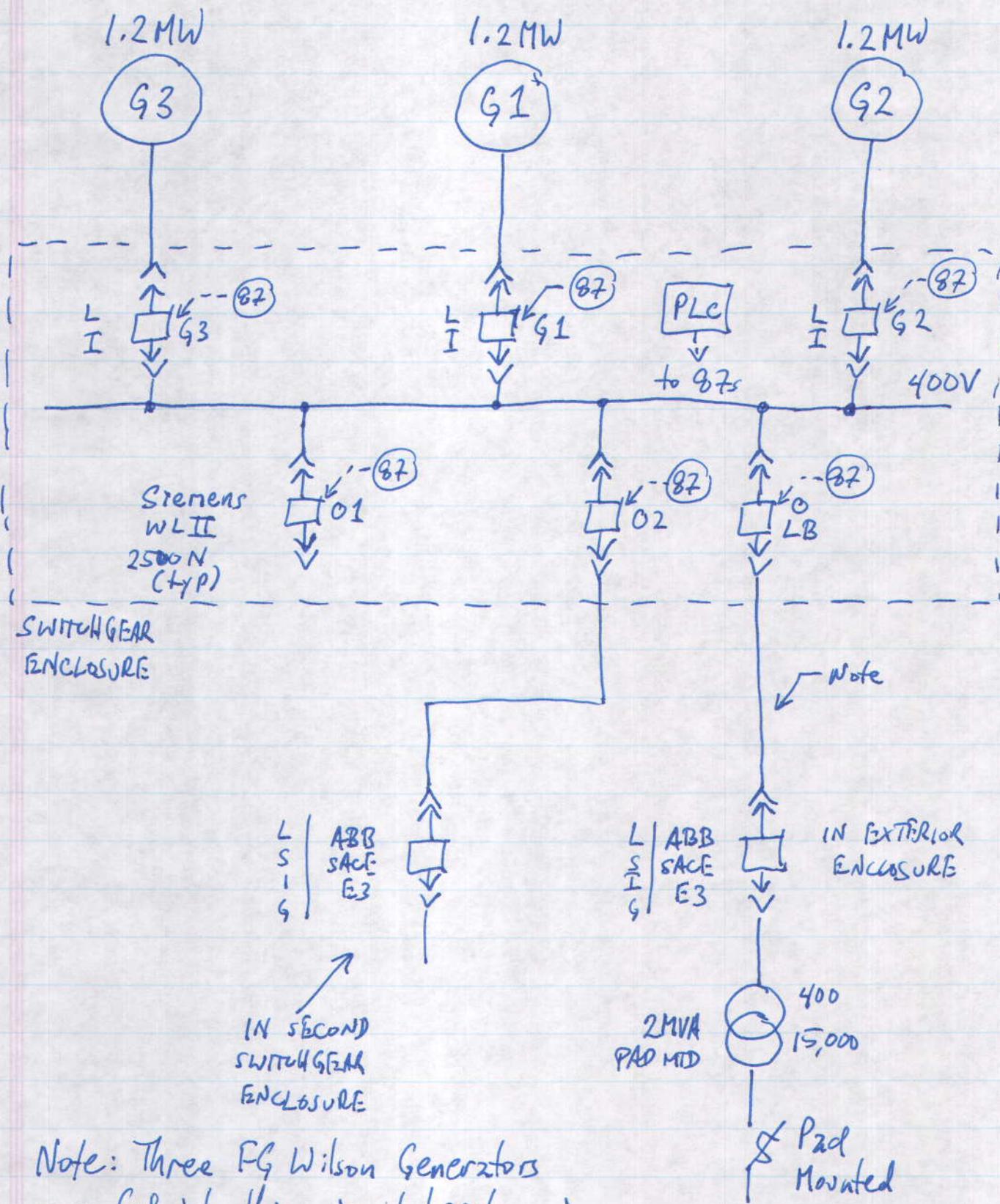
4. Replace old feeder cables. Since there are no spare ducts to pull in a new cable while the existing cable remains in service this would have to be a multi-step process. A new, temporary cable would be laid on the ground and then a short outage would be required to change over to putting it in service. Then, the existing feeder cable would have to be removed and the duct cleaned and a new cable installed. A second outage would be required to energize the new, underground cables. Finally, the temporary, above ground cable could be removed.

Again, since the circuit breaker that is tripping does not have a tripping unit this recommendation is not a likely factor to determine the source of the immediate problem.

5. Since the PLC is a Siemens device and the PLC programming is likely proprietary, Tetra Tech suggests Embassy staff contact Siemens for support regarding any PLC and associated programming issues.

Attachments:

1. WOA0093 One Line Sketch, Sep 3, '13, 1 page
2. Siemens SIMATIC, Programming device, SIMATIC Field PG M3, 26 pages



Note: Three FG Wilson Generators were fed into this circuit breaker in the past. The cable was left cold for two years and now trips 'touchy'.

3 Sep '13
AESF TZ
WO-A-0093
Ladernm24

SIEMENS

SIMATIC

Programming device SIMATIC Field PG M3

Getting Started

<u>Introduction</u>	1
<u>Description</u>	2
<u>Application planning</u>	3
<u>Installing and connecting</u>	4
<u>Commissioning</u>	5
<u>Appendix</u>	A

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
with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.
CAUTION
without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.
NOTICE
indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

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 for the specific task, 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 adhered to. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of the Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

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.

Table of contents

1	Introduction	5
2	Description	7
2.1	Exterior design	7
2.2	Connecting elements	10
2.3	Operator controls	11
2.3.1	On/off button	11
2.3.2	Touchpad	12
3	Application planning	13
3.1	Unpacking and checking the delivery unit	13
3.2	Device identification data	14
4	Installing and connecting	15
4.1	Positioning the device	15
4.2	Connecting peripherals	16
4.3	Connecting the device to power.....	16
5	Commissioning	19
5.1	Requirements for commissioning.....	19
5.2	Basic commissioning - initial startup.....	19
A	Appendix	21
A.1	Guidelines and declarations.....	21
A.2	Certificates and approvals	22
A.3	Service and support	24
	Index	25

Introduction

1

Purpose of this documentation

This Getting Started documentation contains all the information you need for commissioning and using the SIMATIC Field PG M3.

Where is this documentation valid?

This documentation is valid for all available versions of the SIMATIC Field PG M3 and describes the delivery state as of April 2010.

SIMATIC Field PG M3 Operating Instructions

The operating instructions are available on the included "Software for Field PG" DVD. To read and print the operating instructions, select the corresponding document in the Welcome.pdf.

The operating instructions provide many useful topics dealing with items such as hardware expansion options, changing the device configuration and technical data.

The operating instructions also contain a Declaration of Conformity for the device, with respect to safety and EMC requirements.

Safety information

Always follow the instructions in this manual and in the operating instructions in order to avoid personal injury and damage to assets. The warnings are highlighted by a warning triangle and presented in different forms based on the degree of hazard.

Conventions

The term "PG" or "device" is also used to refer to the SIMATIC Field PG M3 product in this documentation.

Description

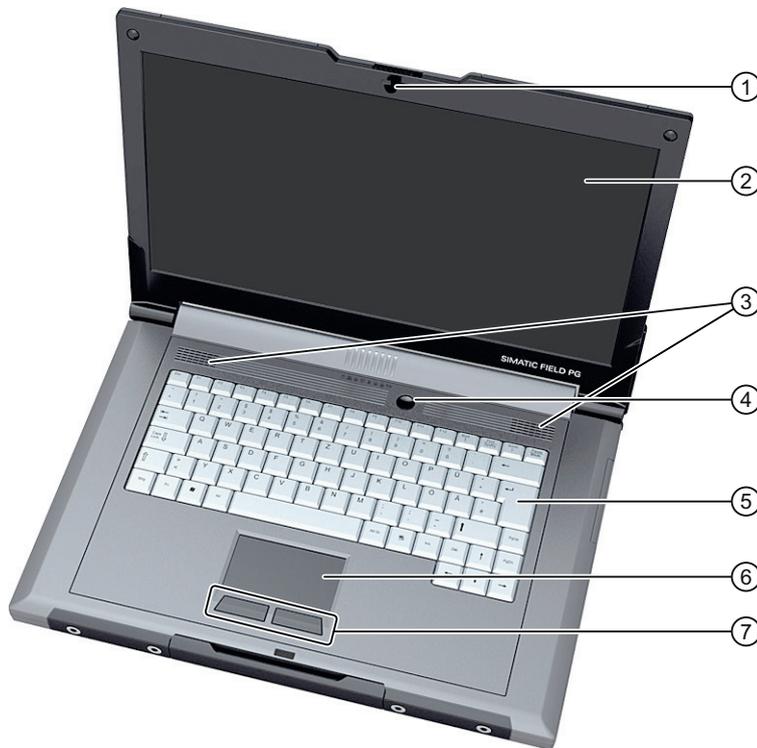
2.1 Exterior design

View with closed display



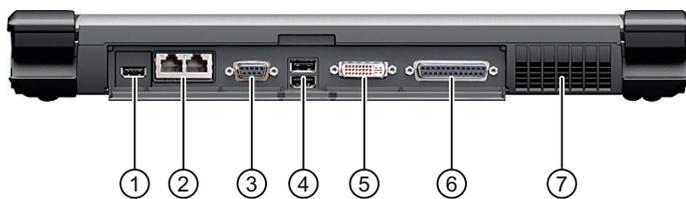
- ① System and keyboard LEDs
- ② Display latch
- ③ Device handle

Front view with display open



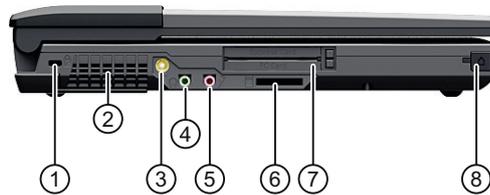
- ① Display latch
- ② Display
- ③ Stereo speakers
- ④ On/off button (power)
- ⑤ Keyboard
- ⑥ Touchpad
- ⑦ Mouse buttons

View from rear



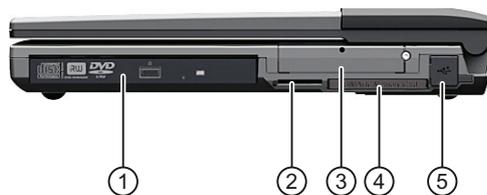
- ① USB 2.0 for Bluetooth dongle
- ② 2 Ethernet
- ③ MPI/DP
- ④ 2 USB 2.0
- ⑤ DVI-I
- ⑥ COM1/TTY (TTY interface, dependent on variant used)
- ⑦ Ventilation air outlet

View of left side



- ① Opening for Kensington lock
- ② Ventilation air inlet
- ③ DC IN 19 V
- ④ Headphones
- ⑤ Microphone
- ⑥ Media Card Reader (interface for SMC, SDHC, MMC (Multi Media Card - not SIMATIC MMC), XD and MS Pro)
- ⑦ Express card and PC card slot
- ⑧ Modem port (RJ11) with cover

View of right side



- ① Optical drive
- ② SIMATIC Micro Memory Card interface
- ③ Exchangeable hard disk unit
- ④ Memory card interface
- ⑤ 2 USB 2.0 (with cover)

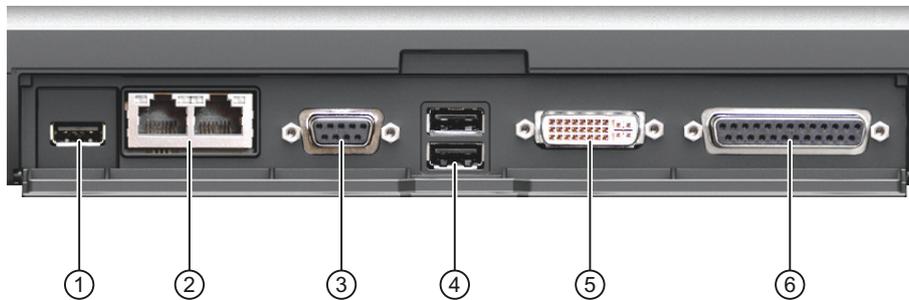
View from below



- ① Memory expansion
- ② Rating plate
- ③ Rechargeable battery

2.2 Connecting elements

Layout of the interfaces on the rear of the device



- ① USB 2.0 for Bluetooth dongle (optional)
- ② 2 RJ45 Ethernet ports for 10/100/1000 Mbps
- ③ MPI/DP interface (RS 485, electrically isolated), 9-pin sub-D socket
- ④ 2 USB 2.0 ports
- ⑤ DVI/VGA port for CRT or LCD monitor with DVI interface, VGA via DVI/VGA adapter
- ⑥ COM1(TTY) (variant-dependent) for connecting S5 automation devices, or standard V.24 via the "Serial Port Adaptors D9/D25" adapter supplied for connecting devices with a serial port, such as a modem or mouse.

2.3 Operator controls

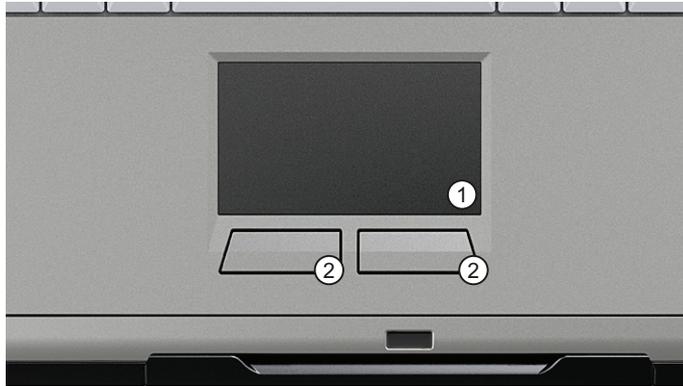
2.3.1 On/off button

On/off button	Description
	<p>The on/off button (power) has the following functions:</p> <ul style="list-style-type: none">• Switch on/off the PG (press the button for approximately 1 second, the behavior depends on the Windows Power Options settings)• Switch off the PG (press for more than 7 seconds)

For information on the configuration of the On/Off button, refer to the On/Off button section in the operating instructions.

2.3.2 Touchpad

Touchpad and mouse buttons



- ① The touchpad can be used in many programs (with mouse operation) as an input device for controlling the cursor and selecting menus. You can position the touch-sensitive cursor anywhere on the screen.
- ② Pressing the left mouse button selects an object. The response to the right button depends on the user program.

Note

The touchpad function (mouse pointer and mouse buttons) can be enabled and disabled with the hotkey Fn + F4.

You can configure the advanced touchpad functions under "Mouse" in the Windows Control Panel. The technical principle used means that it is possible to make unintentional mouse clicks with the touchpad when it is used in a "noisy" environment. In such environments, it is a good idea to disable the tap function in the touchpad driver, and to use the mouse buttons.

Application planning

3.1 Unpacking and checking the delivery unit

Unpacking the device

Note the following points when you unpack the unit

- It is advisable not to dispose of the original packing material. Keep it in case you have to transport the unit again.
- Please keep the documentation in a safe place. It is required for initial commissioning and is part of the device.
- Check the delivery unit for any visible transport damage.
- Check the delivery and your specially ordered accessories against the packaging list to ensure nothing is missing. Please inform your local dealer of any disagreements or transport damages.

3.2 Device identification data

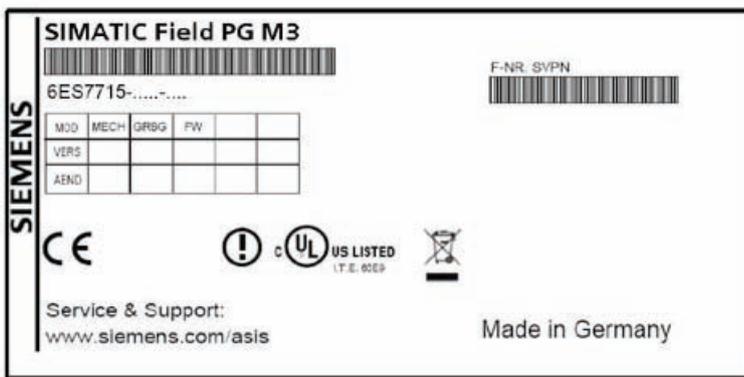
Noting the device identification data

The device can be identified uniquely with the help of these numbers in case of repairs or theft.

Enter the following data in the table below:

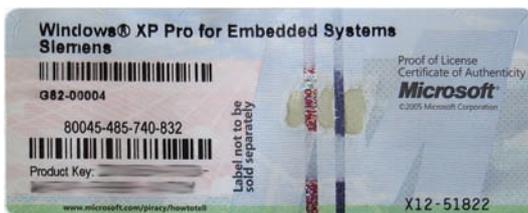
- Serial number: The serial number (S VP) is located on the rating plate on the bottom of the device.

Rating plate



- Order number of the device
- Ethernet address: The Ethernet addresses of the device can be found in the BIOS Setup (F2 key) under Main > Hardware Options > Onboard Ethernet Address.
- Microsoft Windows "Product Key" from the "Certificate of Authenticity" (COA). The COA label is stuck to the bottom on the device. The Product Key is always required to reinstall the operating system.

COA label



Serial number	S VP ...
Order No.	6ES ...
Microsoft Windows Product Key	
Ethernet address 1	
Ethernet address 2	

Installing and connecting

4

4.1 Positioning the device

! WARNING
The outer housing is made of Magnesium. If it comes into contact with open flame, there is a risk of fire / spreading fire.

CAUTION
Always set the PG down on its underside, otherwise there is a risk that it will fall over and damage sensitive components.

- Position the programming device to ensure comfortable operation and safety.
- Position the programming device with its bottom on a flat surface and at a comfortable height and distance.
- Ensure that a power outlet is easily accessible near your workplace.
- Ensure that there is enough space for connecting peripherals.
- Do not obstruct any ventilation slots when you position the device.
- Open the display by sliding the latch in the direction of the arrow.
- Flip the display open and adjust it to a convenient viewing angle. The display can be adjusted to any inclination angle between 0 and 150°.



4.2 Connecting peripherals

To be noted before you connect the device

CAUTION

Peripheral devices that are incapable of hot-plugging may only be connected after the device has been disconnected from the power supply.

CAUTION

Strictly adhere to the specifications for peripheral equipment.



WARNING

When connecting long signal lines (particularly with connections spanning buildings), ensure the signal lines are always integrated in the local potential equalization (connecting the screen with the grounding wire).
--

4.3 Connecting the device to power

To be noted before you connect the device

Note

The external power unit supplies power to the Field PG in line operation with 120 V and 230 V power supply networks. The setting of the voltage range takes place automatically.

The battery is charged in line operation, that's why you need to install the supplied battery before you connect the device to the power supply.



WARNING

Do not connect or disconnect power and data cables during thunderstorms.
--



WARNING

The device is designed only to be used in grounded power supply systems (TN systems to VDE 0100, part 300, or IEC 60364-3).

It must not be used in ungrounded, or impedance-grounded power systems (IT systems).
--

 **WARNING**

The Field PG may only be operated using the supplied power supply and / or using the supplied battery.

The external power supply may not be covered (risk of overheating).

 **CAUTION**

The mains connector must be disconnected to fully isolate the device from mains.

Localized information

Outside of the USA and Canada, operation on a 230 V power supply:

This device is equipped with a safety-tested power cord. If you choose not to use this cable, you must use a flexible cable of the following type: At least 18 AWG (0.82 mm²) conductor cross-section, and 15 A/250 V connector. The cable set must conform to the safety regulations of the country in which the devices are installed, and bear the prescribed markings in each case.

For the USA and Canada:

For the United States and Canada, a CSA or UL-listed power cord must be used.

The connector must be compliant with NEMA 1-15P.

120 V/240 V supply voltage

A flexible cable with UL approval and CSA marking must be used. In addition, the cable must exhibit the following properties:

- SPT-2 or SVT design with two conductors
- At least 18 AWG conductor cross-section
- Max. length of 4.5 m
- Connector 15 A, min. 125 V

Connecting

Steps for connecting the device to mains		
1	Turn the PG over so that it is lying on the table with its display unit closed.	
2	Release ① the battery cover ② on the bottom of the device and open it.	
3	Insert the battery.	
4	Close the cover and turn the device over again.	
5	Insert the supplied power supply cable into the external power supply.	
6	Insert the low-voltage connector into the connection ① on the device.	
7	Plug the external power supply into a socket with a grounded protective conductor.	

Commissioning

5

5.1 Requirements for commissioning

The operating system and system software of your device are preinstalled on the hard disk.

CAUTION
Risk of damage to the device!
Allow the device to warm up slowly to room temperature before you start it up. If you notice any condensation, wait around 12 hours before you switch on the device.

5.2 Basic commissioning - initial startup

NOTICE
The programming device may not be switched off at any time during the installation process.
Do not change the default BIOS settings, otherwise the operating system setup may become corrupted.

Procedure

The operating system is set up automatically on the programming device when it is **first** started. The following tasks need to be performed:

1. Press the on/off button and hold it down for at least 1 second. The PG conducts a self-test. During the self-test, the following message appears:
Press F2 to go to SETUP Utility /Press ESC to go to Bootmanager
2. Wait until this message is cleared, then follow the instructions on the screen.
3. Type in the Product Key as required. You find this key on the "Certificate of Authentication", in the "Product Key" line.
4. Automatic restart

After you have entered all necessary information, and after the operating system setup is completed, the PG is automatically restarted and displays the user interface of the relevant operating system.

From now on, after you switch on the PC, the user interface of the operating system is automatically opened when the startup routine is completed.

Startup with Microsoft Windows

The menus, dialogs, and keyboard layout are set up in English under Windows XP MUI. You can set another language and another keyboard layout by selecting **Start > Control Panel > Date, Time, Language, and Regional Options > Add other languages**.

Windows 7 in preparation.

Authorization / License key

A product specific authorization or a License Key (user authorization) is required to use the STEP 5-, STEP 7- and WinCC flexible programming software. This protected software may only be used with the relevant authorization. The authorization and the license keys for the SIMATIC software are found on the supplied USB Memory Stick.

In order to use the license keys, open the protective cap of the stick and connect this license stick to a free USB port of your computer.

After a short time a drive named "License_Key" will appear in Windows Explorer.

During a new installation, you will be notified by the Setup program if a matching license key has not been installed on your computer. You can then choose to have the Setup program install the license or to install the license later with the Automation License Manager you are going to install.

If you want to transfer the license key later, follow these steps:

1. Close the Automation License Manager. Locate the drive named "License_Key" in the left pane.
2. Click the drive named "License_Key".

This displays an overview of the license keys found on the license stick.

3. Use a drag-and-drop operation to move the desired license key to one of your drives.
4. After the transfer, the license key is located on the corresponding drive and you can now use the activated software.

Prior to removing the license stick, make sure to give notice according to Windows specifications ("Safely remove hardware").

If required, you can use the license stick to transfer license keys from one computer to another or to store license keys temporarily.

NOTICE

Software installed on the PG for which there is no authorization or a license key in the delivery package, cannot be used or will only run in Trial mode.

Appendix

A.1 Guidelines and declarations

Notes on the CE mark

 The following applies to the SIMATIC product described in this documentation:

RTTE directive

This product is designed for the following applications:

Application	Requirement for	
	Emissions	Immunity
Residential, business and commercial operations, and small businesses	EN 61000-6-3: 2007	EN 61000-6-1: 2007
Industrial applications	EN 61000-6-4: 2007	EN 61000-6-2: 2005

The device complies with EN 61000-3-2:2006 (harmonic currents) and EN 61000-3-3:2008 (voltage fluctuations and flicker.)

This product meets the requirements of EC directive 1999/5/EEC "Radio Equipment and Telecommunications Terminal Equipment - Use of the Radio Spectrum": EN 300 328 V1.7.1 / EN 301 893 V1.5.1 / EN 301 489-17 V1.3.2 / EN 302 489-1 V1.8.1

Directive 1999/5/EC contains the requirements of Directive 2004/108/EC "Directive of the Council on the Approximation of the Laws of Member States relating to Electromagnetic Compatibility (EMC Directive).

- Safety: see Low voltage directive
- Power system compatibility with modem interface:TBR21

Low voltage directive

This product fulfills the Directive 2006/95/EEC of the European Parliament and of the Council on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.

Requirements of EC Directive 2006/95/EEC "Low voltage directive". Compliance with this standard has been verified according to EN 60950-1:2006.

Declaration of conformity

The EC declaration of conformity and the corresponding documentation are made available to authorities in accordance with the EC directives stated above. Your sales representative can provide these on request.

Installation guidelines

The installation guidelines and safety notices specified in the supplied documentation must be adhered to during commissioning and operation.

Connecting peripherals

The requirements for noise immunity are met when you connect a peripheral suitable for an industrial environment according to EN 61000-6-2:2005. Peripheral devices must only be connected using shielded cables.

A.2 Certificates and approvals

DIN ISO 9001 certificate

The Siemens quality management system for all production processes (development, production, and sales) meets DIN ISO 9001:2000 requirements.

This has been certified by DQS (the German society for the certification of quality management systems).

Q-Net certificate no.: DE-001108 QM

Software License Agreement

The device is shipped with preinstalled software. Please observe the corresponding license agreements.

Certifications for the United States, Canada, and Australia

Product safety

The following approval is available for the device:	
	Underwriters Laboratories (UL) according to Standard UL 60950-1 Second Edition and Canadian Standard CAN/CSA-C22.2 No. 60950-1-07 Second Edition

WLAN

The integrated wireless LAN conforming to IEEE 802.11 a/b/g/n is certified for the following countries: Germany, France, Italy, Spain, Great Britain, Austria Please follow the relevant local regulations when operating the device outside these countries.

Interference-Causing Equipment Standard

Country	Approvals/ Determinations
USA	<p>FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT</p> <p>This equipment has been tested and found comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used accordance with the instruction manual, may cause harmful interference to radio communications. Operations of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.</p> <p>SHIELDED CABLES</p> <p>Shielded cables must be used with this equipment to maintain compliance with FCC regulations.</p> <p>MODIFICATIONS</p> <p>Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.</p> <p>CONDITIONS OF OPERATION</p> <p>This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.</p>
Canada	<p>CANADIAN NOTICE</p> <p>This Class B digital apparatus complies with Canadian ICES-003.</p> <p>AVIS CANADIEN</p> <p>Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada</p>

C-Tick Mark (Australia)

	Our products meet the requirements of AS/NZS CISPR 22.
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A.3 Service and support

Local information

Contain your Siemens representative (<http://www.siemens.com/automation/partner>) if you have questions about the products described here.

Technical documentation for SIMATIC products

You can find additional documentation for SIMATIC products and systems in the Internet: SIMATIC Guide manuals (<http://www.siemens.com/simatic-tech-doku-portal>)

Easy shopping at the mall

You can find the online catalog and order system under:
Industrial Automation and Drive Technologies (<http://mall.automation.siemens.com>)

Training center

All the training options are listed at:
SITRAIN homepage (<http://www.sitrain.com>)
Your contact partner is available at: Tel. + 49 911 895 3200

Technical support

You can contact technical support for all Industry Automation and Drive Technologies products by:

- Phone: +49 180 5050 222
- Fax: +49 180 5050 223
(0.14€/minute from the German landline network, deviating mobile communications prices are possible)
- E-mail: support.automation@siemens.com
- Internet: Online support request form: (<http://www.siemens.com/automation/support-request>)

When you contact the customer support, please have the following information for the technician on hand:

- BIOS version
- Order No. (MLFB) of the device
- Installed additional software
- Installed additional hardware

Online Service & Support

Information about the product, Support and Service, right through to the Technical Forum, can be found at: Industry Automation and Drive Technologies - Homepage (<http://www.siemens.com/automation/service&support>)

After-sales information system for SIMATIC PC / PG

Information about contacts, drivers, and BIOS updates, FAQs and Customer Support can be found at: After-sales information system for SIMATIC PC/PG (<http://www.siemens.com/asis>)

Index

A

Approvals, 22
Authorization, 20

C

Certificates, 22
COA label, 14
Connecting, 16

D

Declarations of Conformity, 21
Device
 unpacking, 13

E

Ethernet address, 14

I

Identification data, 14
Initial commissioning, 19

L

License key, 20
Localized information, 17
Low voltage directive, 21

M

Microsoft Windows Product Key, 14
Mouse buttons, 12

O

On/off button, 11
Operating system, 19
 Starting for the first time, 19
Operator controls, 11

Order No., 14

P

Positioning the device, 15
Power Button, 11
Power supply
 Connecting, 16

R

Rating plate, 14
Restart, 19
RTTE directive, 21

S

Serial number, 14
Starting for the first time, 19
Supply voltage, 17

T

Touchpad, 12

U

Unpacking
 Unpacking the device, 13

W

Wireless LAN
 Regulations, 22

