

TC MOBILE I/O...



Remote monitoring via mobile communication

Data sheet
105326_en_04

© PHOENIX CONTACT 2015-05-06

1 Description

The compact TC MOBILE I/O... signaling system allows you to monitor analog and digital values via the mobile communication network as well as to remotely switch relay outputs.

The data is transmitted via SMS, e-mail or GPRS, depending on the series. The signaling system is available as a DC or AC version with an expanded voltage range (10 V ... 60 V DC or 93 V ... 250 V AC). For an overview of the series, see "Comparison of product features" on page 4.

A USB connection to a computer and a web browser is all that is needed for configuration. The device features numerous helpful software functions, such as mobile communication diagnostics, sending of log books via e-mail, and different user roles. All product versions can be mounted on a DIN rail or a mounting surface.

1.1 Applications

- Machine, building, and system monitoring
- Pumps, wastewater treatment plants, water supply
- Lighting control systems, remote switchgear
- Elevators, gates
- Alarm technology and building services
- HVAC technology
- Battery monitoring (up to 60 V)
- Railway applications (in acc. with EN 50121-4)

1.2 Features

- Data transmission via SMS, e-mail, GPRS (ODP protocol), depending on the product version
- Communication: event-controlled or continual
- Four digital inputs
- Four relay outputs, can be switched via mobile communication
- DC version: two additional analog inputs, each can be switched between voltage and current
- Standard SIM card
- Compact design: 4 div. in acc. with DIN 43880
- EX approval: II 3 G Ex nA nC IIC T4 Gc X
- Housing cover, can be sealed
- Configuration via web browser
- SMS alarm in the event of power failure
- Numerous helpful software functions
- Cost-effective remote control substation with OPD protocol



WARNING: Explosion hazard when used in potentially explosive areas

The device is a category 3 item of electrical equipment. Follow the instructions provided here during installation and observe the safety notes.



Make sure you always use the latest documentation.
It can be downloaded at phoenixcontact.net/products.

This data sheet is valid for all products listed on the following page:

2 Table of contents

1	Description.....	1
2	Table of contents	2
3	Ordering data.....	3
4	Technical Data.....	5
5	Safety notes.....	8
6	Description.....	9
7	Communication channels at a glance	12
8	Software	14
9	FCC approval.....	18

3 Ordering data



Operation of the wireless system is only permitted with accessories supplied by Phoenix Contact. The use of other accessory components may invalidate the operating license. You can find the approved accessories for this wireless system in this data sheet or listed with the product at phoenixcontact.net/products.

For initial startup, you require a USB cable and an antenna. These accessories are not included in the scope of delivery.

Remote control and signaling system

Description	Type	Order No.	Pcs. / Pkt.
Remote control and signaling system via mobile communication, four digital inputs and four relay outputs (N/O contact), two additional analog inputs, each can be switched between current and voltage: Current: 0 mA ... 20 mA or 4 mA ... 20 mA (switchable), Voltage: 0 V ... 60 V			
Supply voltage of 10 V ... 60 V DC	TC MOBILE I/O X200	2903805	1
Supply voltage of 10 V ... 60 V DC, with ODP functionality	TC MOBILE I/O X300	2903807	1
Remote control and signaling system via mobile communication, four digital inputs and four relay outputs (N/O contact),			
Supply voltage of 93 V ... 250 V AC	TC MOBILE I/O X200 AC	2903806	1
Supply voltage of 93 V ... 250 V DC, with ODP functionality	TC MOBILE I/O X300 AC	2903808	1

Accessories

Description	Type	Order No.	Pcs. / Pkt.
GSM antenna for direct assembly on the device, angled antenna plug (90°, SMA round plug). The antenna is suitable for hidden installation in a plastic control cabinet.	PSI-GSM-STUB-ANT	2313342	1
GSM UMTS omnidirectional antenna , 2 dBi gain, 5 m antenna cable with SMA round plug	PSI-GSM/UMTS-ANT-OMNI-2-5	2900982	1
GSM UMTS antenna , with omnidirectional characteristic, 2 m antenna cable with SMA round plug	PSI-GSM/UMTS-QB-ANT	2313371	1
GSM UMTS antenna cable , 10 m long; SMA (male) → SMA (female), 50 Ohm impedance	PSI-CAB-GSM/UMTS-10M	2900981	1
GSM UMTS antenna cable , 5 m long; SMA (male) → SMA (female), 50 Ohm impedance	PSI-CAB-GSM/UMTS- 5M	2900980	1
DIN rail power supply , 24 V DC/0.75 A, primary-switched, single phase, 61 mm depth	STEP-PS/ 1AC/24DC/0.75	2868635	1
USB cable , 3 meter USB connecting cable, USB plug type A to USB plug type mini-B; length: 3 m	CABLE-USB/MINI-USB-3.0M	2986135	1

ODP licenses

Description	Type	Order No.	Pcs. / Pkt.
ODP licenses for TC MOBILE I/O X300 and X300 AC			
Software dongle AX ODP SERVER for 5 remote control substations	AX ODP SERVER 5FU	2700391	
Software dongle AX ODP SERVER for 8 remote control substations	AX ODP SERVER 8FU	2700392	
Software dongle AX ODP SERVER for 10 remote control substations	AX ODP SERVER 10FU	2700393	
Software dongle AX ODP SERVER for 15 remote control substations	AX ODP SERVER 15FU	2700394	
Software dongle AX ODP SERVER for 20 remote control substations	AX ODP SERVER 20FU	2700396	
Software dongle AX ODP SERVER for 25 remote control substations	AX ODP SERVER 25FU	2700397	
Software dongle AX ODP SERVER for 30 remote control substations	AX ODP SERVER 30FU	2700399	
Software dongle AX ODP SERVER for 50 remote control substations	AX ODP SERVER 50FU	2700400	
Software dongle AX ODP SERVER for 75 remote control substations	AX ODP SERVER 75FU	2700401	
Software dongle AX ODP SERVER for 100 remote control substations	AX ODP SERVER 100FU	2700402	
Software dongle AX ODP SERVER for 150 remote control substations	AX ODP SERVER 150FU	2700403	
Software dongle AX ODP SERVER for 200 remote control substations	AX ODP SERVER 200FU	2700404	
Software dongle AX ODP SERVER for 250 remote control substations	AX ODP SERVER 250FU	2700406	

Further ODP licensing models on request

Comparison of product features

	X200	X200 AC	X300	X300 AC
Supply voltage				
Supply voltage 10 V ... 60 V DC	●		●	
Supply voltage 93 V ... 250 V AC		●		●
Inputs				
Four digital inputs	●	●	●	●
Two analog inputs, can be switched between current and voltage	●		●	
Continual data transmission via SMS, e-mail	●	●		
Event-controlled data transmission via SMS, e-mail	●	●		
Continual data transmission via ODP (GPRS)			●	●
Event-controlled data transmission via ODP (GPRS)			●	●
Outputs				
Four relay outputs (N/O contact)	●	●	●	●
Set a switching output for incoming SMS	●	●		
Set a switching output for incoming ODP command			●	●
Set a switching output for incoming e-mail	(This function is not enabled for security reasons)			
Communication channels				
Sending and receiving SMS messages	●	●		
Sending e-mails on the Internet	●	●		
Bidirectional communication with an ODP control system (GPRS)			●	●
Security				
Password protection (login on the device website)	●	●	●	●
Encrypted memory for the SIM card PIN	●	●	●	●
Selection of authorized users (white list)	●	●	●	●
Configuration changes are logged in the log book	●	●	●	●
Three user groups: admin, user, user-defined	●	●	●	●
Data encryption according to ODP specification			●	●
Acknowledgement of receipt of incoming SMS messages	●	●		
Alarms and signaling				
Via SMS in the event of a power failure	●	●		
Event-controlled, for positive and/or negative edge	●	●	●	●
Analog inputs: have four switching thresholds for alarms (hysteresis), upper value range (fallen below/exceeded) and lower value range (fallen below/exceeded)	●		●	
Alarm for current input (configuration: 4 mA ... 20 mA) as soon as current is < 4 mA	●		●	
Send to individuals and groups of people (SMS and e-mail)	●	●		
Alarm to an ODP control system			●	●
Data transmission				
Cyclical, at a regular point in time (minute to month), via SMS or e-mail	●	●		
Cyclical, at a regular point in time (minute to month), via ODP			●	●
Address book entries				
Address book with up to 50 contacts	●	●		
Change address book entries via SMS, modification via e-mail is not supported for security reasons	●	●		
ODP partner			●	●
Configuration				
Integrated configuration software via web browser (USB interface)	●	●	●	●
Supported languages: English, German	●	●	●	●
Device configuration can be exported or imported as a file	●	●	●	●

Comparison of product features

Comparison of product features				
Diagnostics	X200	X200 AC	X300	X300 AC
Integrated log book	●	●	●	●
Mobile communication network diagnostics	●	●	●	●
Charge request	●	●		
SMS counter	●	●		
Send log book entries as e-mail	●	●		
Data volume counter (net data volume)	●	●	●	●
Additional functions	X200	X200 AC	X300	X300 AC
Integrated clock, incl. 96 h buffer at 25°C, minimum 48 h	●	●	●	●
Time stamp from the ODP control system			●	●

4 Technical Data

General data

Housing system	4 div. in acc. with DIN 43880	
Dimensions	71.6 mm x 62.2 mm x 89.7 mm	
Degree of protection	IP20	
Ambient temperature		
Storage	-40°C ... +85°C	
Operation	-25°C ... +70°C (observe derating)	
Derating, maximum ambient temperature	SMS mode	GPRS data link
Relay not used	70°C	60°C
Maximum relay load current 1 A	60°C	55°C
Maximum relay load current 5 A (AC version)	50°C	50°C
Maximum relay load current 6 A (DC version)	50°C	50°C
Relative humidity	0 % ... 95 %	
Permitted characters for configuration		
SMS text messages	@£\$¥èúìòÇñÐøŕĂâ_ÆæßÉ !"#€%&'()*+,-.\/0-9;=<=>?¡A-ZÄÖÑÛ\$¿a-zäöñüà	
Input fields for credentials	!"#%&'()*+,-.\/0-9;=<=>@A-Z[V]^_`a-z{ }~	
Further text input fields (e.g. commands sent to the device by SMS)	@£\$¥èúìòÇñÐøŕĂâ_ÆæßÉ !"#€%&'()*+,-.\/0-9;=<=>?¡A-ZÄÖÑÛ\$¿a-zäöñüà	
NetBios name	0-9a-zA-Z_\-	
Command for credit check	0-9a-zA-Z_\-	

Power supply¹

DC version		
Supply voltage	10 V DC ... 60 V DC	
Current consumption	Approx. 105 mA ... 175 mA at 24 V DC	
Standby (without engine)	35 mA ... 65 mA at 24 V DC	
AC version		
Supply voltage	93 V AC ... 250 V AC	
Frequency	47.5 Hz ... 63 Hz	
Frequency tolerance	-15% ... +10% (with regard to 50 Hz and 60 Hz)	
Current consumption	30 mA ... 55 mA at 230 V AC, typical	
Standby (without engine)	10 mA ... 15 mA at 230 V AC	

¹ Supply only via the USB interface is possible with limited functionality.

Inputs

Digital inputs

Number	4
Designation	DI1, DI2, DI3, DI4
Electric strength	Maximum supply voltage
Discrimination threshold, DC version	Low = 0 % ... 30 % of the applied supply voltage High = 70 % ... 100 % of the applied supply voltage
Discrimination threshold, AC version	Low = 0 V ... 50 V AC High = 90 V ... 250 V AC Typical input current at 250 V AC: 3.5 mA

Analog inputs (DC version only)

Number	2, each with 3 terminal blocks (U, I, GND)
Designation	U1, I1, GND1 U2, I2, GND2
Electric strength	Maximum supply voltage
Voltage range (U1 and U2)	0 V ... 60 V
Current range (I1 and I2)	0 mA ... 20 mA/4 mA ... 20 mA (offset switching via software)
Electric strength of current input	Maximum supply voltage
Resolution	15-bit
Error limit, with reference to the input range	
Current input accuracy	±0.1 %
Voltage input accuracy	±0.1 %
Error limit with interference	±0.2 %
Input impedance: voltage input	600 kOhm
Input impedance: current input	50 Ohm
Sample speed	< 200 ms
Tolerance through temperature response	< ±0.2 %

Switching outputs

DC version

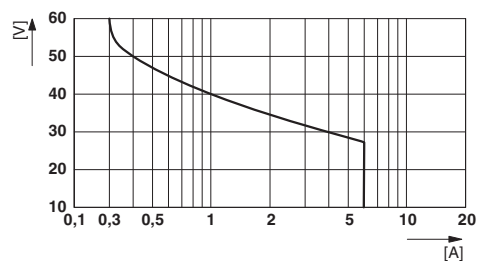
Technical data for the relay	
Number	4
Contact type	1
Limiting continuous current	6 A
Maximum switching voltage	60 V DC
Maximum switching capacity	1500 VA
Minimum switching voltage	5 V
Minimum switching current	> 10 mA
Insulation distance	Between coil and contact 4000 V _{rms}

DC load limit curve

Switching current [A]

Switching voltage [V]

① Ohmic load



AC version

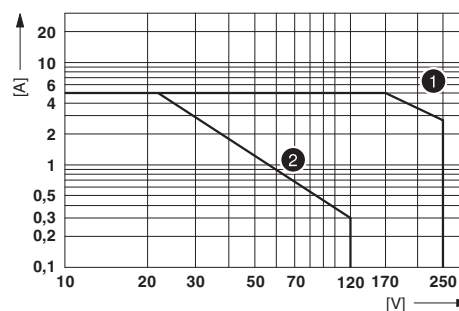
Technical data for the relay	
Number	4
Contact type	1

Switching outputs [...]

Limiting continuous current	5 A
Maximum switching voltage	250 V AC/125 V DC
Maximum switching capacity	750 VA

Load limit curve

Switching current [A]
Switching voltage [V]
① AC, ohmic load
② DC, ohmic load



Minimum switching voltage	5 V
Minimum switching current	> 1 mA
Contact service life	Load 5 A, 30 V DC, (150,000 switching cycles) Load 3 A, 120 V AC, (150,000 switching cycles) Load 5 A, 250 V AC, (30,000 switching cycles)
Insulation distance	Between coil and contact 3000 V _{rms}

Local configuration interface

Connection method	Mini-USB type B, 5 pos., vertical, THT
Type	USB 2.0
Transmission length	3 m

Mobile communication

Frequencies	850 MHz, 900 MHz, 1800 MHz, 1900 MHz
Transmission power	2.0 W: 850 MHz, 900 MHz 1.3 W: 1800 MHz, 1900 MHz
Communication	SMS, GPRS, GSM
GPRS compatibility	Class 10

Approval

FCC approval	FCC Part 15, Section B, Paragraph 15.107(a) and Paragraph 15.109(a), Class B digital device (see "FCC approval" on page 18)
Railway approval	Compliance with standard EN 50121-4 is achieved under the following operating conditions. For installations within the 3 m area and safety-related devices, there are additional requirements specified by EN 50121-4, table 1, note 1. This area is excluded from the manufacturer's declaration. Section 1, Paragraph 3 of EN 50121-4 shall apply. Use power supplies from the Phoenix Contact QUINT product range directly on the device.
Conformity assessment in acc. with Directive 94/9/EC	Ⓔ II 3 G Ex nA nC IIC T4 Gc X (Please follow the special installation instructions in the documentation!)

Screw terminal blocks

Torque	0.5 Nm ... 0.6 Nm (5-7 lb In)
Stripping length	7 mm

5 Safety notes

Only for the DC devices TC MOBILE I/O X200 and TC MOBILE I/O X300:



WARNING: Risk of electric shock

During operation, certain parts of this device may carry hazardous voltages. Disregarding this warning may result in property damage and/or serious personal injury.

- Provide overcurrent protection ($I \leq 6 \text{ A}$) within the installation.
- The power output of the power supply unit must not exceed 240 VA.

Only for the AC devices TC MOBILE I/O X200 AC and TC MOBILE I/O X300 AC:



WARNING: Risk of electric shock

During operation, certain parts of this device may carry hazardous voltages. Disregarding this warning may result in property damage and/or serious personal injury.

- Never carry out work on live parts.
- This device is not suitable for monitoring sensitive systems or time-critical processes. GSM network failures or power supply interruptions may adversely affect monitoring.
- The device is intended for installation in a control cabinet or a comparable container. The device may only be operated when it has been installed. The control cabinet must meet the requirements of EN/IEC 60950-1 in terms of fire protection shielding. Additionally, it must provide adequate protection against electric shock (protection against contact).
- It must be possible to disconnect the device from the power supply. Install an appropriate disconnecting device (fuse, miniature circuit breaker, etc.) for this purpose.
- During electrical installation, observe the current standards and regulations. Installation must be carried out by an expert.

5.1 Installation notes



WARNING:

Make sure that the following notes and instructions are observed and complied with.

- The category 3 device is designed for installation in zone 2 potentially explosive areas. It meets the requirements of EN 60079-0:2012 and EN 60079-15:2010.
- Installation, operation, and maintenance may only be carried out by qualified electricians. Follow the installation instructions as described. When installing and operating the device, the applicable regulations and safety directives (including national safety directives) as well as generally recognized technical regulations must be observed. The safety data is provided in the package slip and on the certificates (conformity assessment, additional approvals where applicable).
- Do not open or modify the device. Do not repair the device yourself; replace it with an equivalent device instead. Repairs may only be carried out by the manufacturer. The manufacturer is not liable for harm resulting from noncompliance.
- The IP20 degree of protection (IEC 60529/EN 60529) of the device is intended for use in a clean and dry environment. Do not subject the device to mechanical and/or thermal loads that exceed the specified limits.
- The device is not suitable for installation in zone 22.
- If, however, you wish to use the device in zone 22, it must be installed in housing that complies with IEC/EN 60079-31. For this purpose, observe the maximum surface temperatures. Observe the requirements of IEC/EN 60079-14.
- Operation of the wireless system is only permitted with the use of accessories supplied by Phoenix Contact. The use of other accessory components may invalidate the operating license. You can find the approved accessories for this wireless system listed with the product at phoenixcontact.net/products.

5.2 Installation in zone 2



WARNING: Explosion hazard when used in potentially explosive areas

Make sure that the following notes and instructions are observed and complied with.

- Observe the specified conditions for use in potentially explosive areas!
- Install the device in a suitable, approved housing (with at least IP54 protection) that meets the requirements of EN 60079-15. For this purpose, observe the requirements of IEC 60079-14 / EN 60079-14.
- Only devices that are suitable for operation in Ex zone 2 and for the conditions at the installation location may be connected to the supply and signal circuits in zone 2.
- In potentially explosive areas, snap the device on or off the DIN rail connector, and connect or disconnect the cables only when the power is disconnected.
- The switches of the device that can be accessed may only be actuated when the power supply to the device is disconnected.
- The mini-USB configuration interface may only be used if it has been ensured that there is no potentially explosive atmosphere present.
- The device must be stopped and immediately removed from the hazardous area if it is damaged, was subjected to an impermissible load, stored incorrectly, or if it malfunctions.
- Ensure that the emitted radio frequency energy is neither bundled (focused) by the antenna itself nor by any installations in the environment of the antenna, and that it cannot enter neighboring zones 1 or 0. Please refer to the technical data for the HF output power. It must not exceed 2 W.
- The HF cable to the antenna must be suitable for the ambient conditions. Install the cable so that it is protected against mechanical damage, corrosion, chemical stress, and negative effects from heat or UV radiation. The same applies to the antenna which is connected to the cable and which functions as a cable termination.
- The antenna itself must meet the relevant requirements of EN 60079-0.

6 Description

6.1 Mounting

The device can be mounted on a 35 mm DIN rail or on the wall.

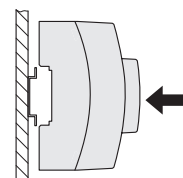


Figure 1 DIN rail mounting

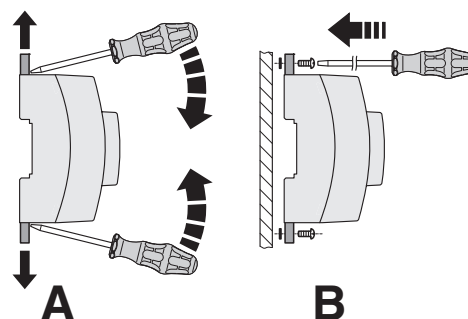
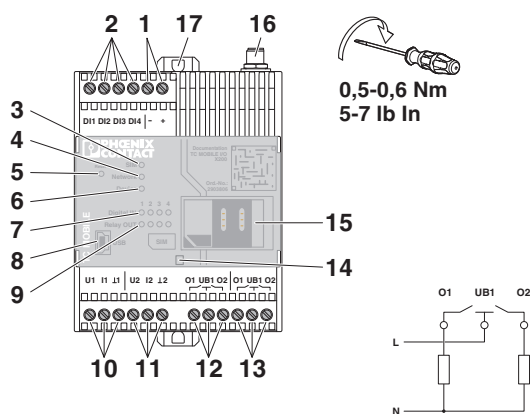


Figure 2 Wall mounting

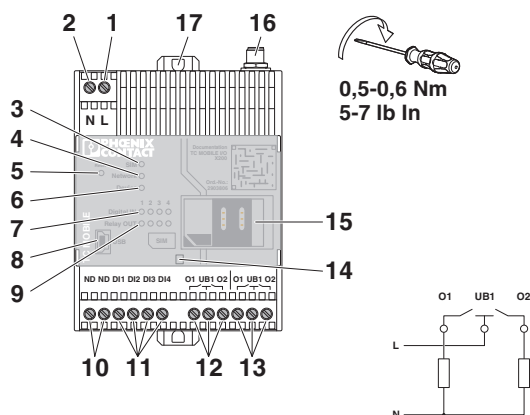
6.2 TC MOBILE I/O X200 and TC MOBILE I/O X300



Display and operating elements

- | | | | |
|----|---|---|--|
| 1 | 24 V DC supply voltage | | |
| 2 | DI1 ... DI4 | Digital inputs | |
| 3 | SIM | Green ON | SIM card ready to operate |
| | | Orange ON | SIM card not inserted |
| | | Orange flashing | Mobile engine awaits PIN, PUK, or a different password |
| | | Red ON | SIM card error |
| 4 | Network | Green ON | Connection present, very good field strength |
| | | Orange ON | Sufficient field strength |
| | | Orange flashing | Poor field strength |
| | | Red ON | No connection |
| 5 | Reset button (keep pressed for three seconds to reset the device to the default settings) | | |
| 6 | Device | Green ON | Power supply via power supply unit |
| | | Orange ON | Power supply only via USB |
| | | Orange flashing | Firmware update |
| | | Red ON | Hardware fault |
| 7 | Digital IN | Green ON | High level at the input |
| | | Green OFF | Low level at the input |
| 8 | USB interface | Only for configuration | |
| 9 | OUT relay | Green ON | Relay picked up, switch contact closed |
| | | Green OFF | Relay dropped out, switch contact open |
| 10 | Analog input 1 | Can be switched between current and voltage | |
| 11 | Analog input 2 | Can be switched between current and voltage | |
| 12 | Relay 1 + 2 (N/O contact) | | |
| 13 | Relay 3 + 4 (N/O contact) | | |
| 14 | Lugs for closing the housing cover | | |
| 15 | SIM card | | |
| 16 | SMA antenna connection (socket) | | |
| 17 | Extendable base latch for wall mounting | | |

6.3 TC MOBILE I/O X200 AC and TC MOBILE I/O X300 AC



Display and operating elements

1	L	230 V AC supply voltage
2	N	230 V AC supply voltage
3	SIM	Green ON SIM card ready to operate
		Orange ON SIM card not inserted
		Orange flashing Mobile engine awaits PIN, PUK, or a different password
		Red ON SIM card error
4	Network	Green ON Connection present, very good field strength
		Orange ON Sufficient field strength
		Orange flashing Poor field strength
		Red ON No connection
		Red ON flashing No connection
5	Reset button	(keep pressed for three seconds to reset the device to the default settings)
6	Device	Green ON Power supply via power supply unit
		Orange ON Power supply only via USB
		Orange flashing Firmware update
		Red ON Hardware fault
7	Digital IN	Green ON High level at the input
		Green OFF Low level at the input
8	USB interface	Only for configuration
9	OUT relay	Green ON Relay picked up, switch contact closed
		Green OFF Relay dropped out, switch contact open
10	ND	Neutral conductor
11	DI1 ... DI4	Digital inputs
12	Relay 1 + 2	(N/O contact)
13	Relay 3 + 4	(N/O contact)
14	Lugs	for closing the housing cover
15	SIM card	
16	SMA antenna connection	(socket)
17	Extendable base latch	for wall mounting

7 Communication channels at a glance

7.1 Overview

The signaling system enables communication via various channels.

- ✓ Sending e-mail (X200 and X200 AC, optionally with SSL encryption)
- ✓ Sending SMS (X200 and X200 AC)
- ✓ Receiving SMS (X200 and X200 AC)
- ✓ Communication with an ODP server (X300 and X300 AC)

However, for security reasons, the following channels are not supported.

- ✗ Alarm via call (free flash call)
- ✗ Switching via call
- ✗ Receiving e-mails from the Internet
- ✗ GPRS communication between two mobile communication devices

If you wish to use the receiving e-mail, alarm call, or switching via call functions despite the increased security risk, please get in touch with Phoenix Contact.

7.2 Sending e-mail (X200 and X200 AC) ✓

The X200 and X200 AC signaling systems can also send alarms and cyclical messages by e-mail. For this purpose, GPRS communication is established with an e-mail server. It is possible to send the entire log book as an e-mail.

In the event of a power failure, e-mails can no longer be sent because it requires more power to establish the connection to an e-mail server than the internal capacitor can store. However, it is still possible to send an SMS.

E-mail communication can take place without encryption or with SSL encryption. STARTTLS is not supported at present. Please consult your e-mail service provider beforehand. Most e-mail service providers support SSL encryption.

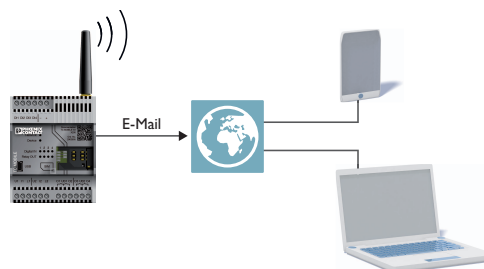


Figure 3 Sending e-mails

7.3 Sending SMS (X200 and X200 AC)

Sending an SMS has the advantage of enabling communication even if mobile communication reception is very poor. An SMS can also be sent without an Internet connection. The X200 and X200 AC signaling systems can send an SMS to individual devices or to a device group. The device group can be configured as a signal chain.



In the event of a power failure, an SMS can still be sent to a selected device.

7.4 Receiving SMS (X200 and X200 AC) ✓

You can switch the integrated relays via SMS messages. If required all four relays can even be switched with a single SMS. It is also possible to send the log book to an e-mail address.

In addition, single telephone book entries can be exchanged via SMS (name and phone number).



The signaling systems are preset so that only SMS commands from contacts that are entered in the telephone book can be processed (white list). This function can be deactivated.

7.5 Receiving e-mail (X200 and X200 AC) ✗

For security reasons, the signaling system does not process any incoming e-mails.

Furthermore, many e-mail servers limit the amount of times that a mailbox can be opened per day. In order for the signaling system to be able to promptly respond to incoming e-mails, it must regularly read the mailbox from the server at very short time intervals. This is prevented by many e-mail services.

Communication via SMS or ODP is a suitable alternative.

7.6 GPRS communication between two mobile communication devices

Many mobile communication providers prevent direct GPRS communication between mobile communication devices that use standard SIM cards. This special function is not supported because it is heavily dependent on the mobile communication network operator.

Communication via SMS or ODP is a suitable alternative.

7.7 Communication with an ODP server (X300 and X300 AC)

The X300 and X300 AC signaling systems communicate via the ODP protocol (Open Data Port) and, by doing so, make it possible to use cost-efficient remote control substations.

ODP is a solution for remote transmission of data in order to adequately monitor systems with external stations, evaluate measured values, and back up data. The signaling systems transmit the data either immediately or with a delay via the GPRS mobile communication service.

The platform is based on a top-down design, i.e., all central and key functions are managed by the control center. The ODP server from Phoenix Contact enables open communication between the signaling system and the control center.

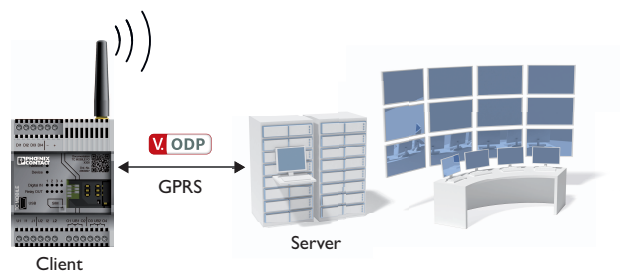


Figure 4 ODP communication

8 Software

Initial startup

Connect the device to a PC simply using a USB cable. During configuration, the device is supplied with current via the USB cable. This means that an additional power supply unit is not required.

The installation wizard will support you during initial startup of the device.

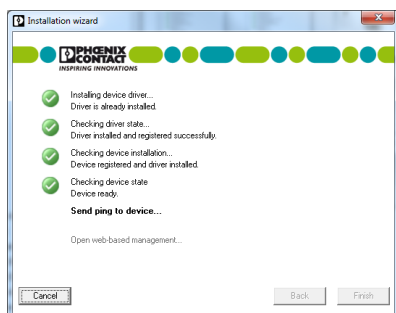


Figure 5 Installation wizard

Help texts integrated in the web interface

Configure the device simply via your web browser, e.g. Firefox. No additional software is required. The device's web interface contains explanatory help texts.

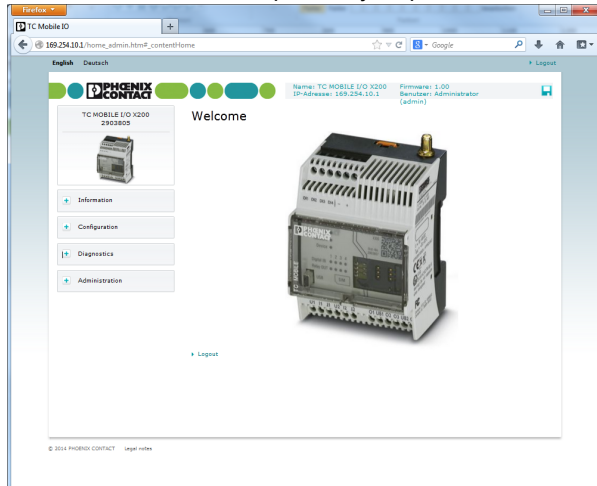


Figure 6 Web interface



The web browser may not open automatically because of individual security settings. You can find further information on opening the web browser manually in a separate user note at phoenixcontact.net/products.

Login

There are two login options:

- Via an IP address
- Via a NetBIOS name

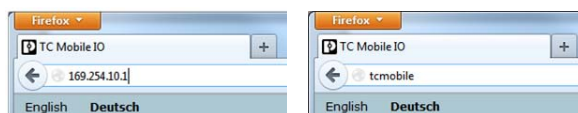


Figure 7 Login via an IP address or NetBIOS name

Three different user roles are available:

- **Guest:** View of the tabs “Information” and “Diagnostics”
- **User:** Guest rights plus selective enabling in the areas “Configuration” and “Administration”
- **Administrator:** All rights for “Diagnostics”, “Configuration”, and “Administration”

In this way, your final customers can call up the diagnostics themselves, but cannot change the parameterization of the device.



Remote access via USB/Ethernet converter is **not** possible, because a virtual network card is automatically installed in the connected partner. USB/Ethernet converters do not usually support this function.

8.1 Configuration

SIM card

You can use a SIM card that is protected with a PIN code. The PIN is encrypted when saved in the device. In addition, you can seal the cover of the device so that the card cannot be removed.

Assigning names

You can assign the device an individual name with a maximum of 32 characters. Alternatively, you can read in the serial number or the IMEI address.

Date/time

The time format can be set for either 12 hours or 24 hours, automatically or manually. Optionally, the time can also be corrected manually. If the device loses its own time setting, e.g. after a power outage of more than 96 hours, it will send itself an SMS. In this way, the device can get as close to the actual time as possible.

Telephone book

The telephone book contains up to 50 contacts with name, phone number, or e-mail address. You can also change telephone book entries via SMS. When the entry has been successfully changed, the administrator receives confirmation by SMS.

Signal chain

You can create a signal chain. An alarm is sent to the signal chain's devices by e-mail or SMS according to the chronological order of telephone entries. E-mail recipients cannot confirm the message however.

The signal chain is interrupted when the device receives a confirmation SMS. You are free to choose the text of the confirmation SMS. The time window within which the devices have to send confirmation can be set to between one minute and 999 hours.

Digital inputs

The alarm can be triggered in three ways:

- For positive edge
- For negative edge
- For positive and negative edge

The alarm can be triggered immediately or after a waiting period of 0 seconds to 999 hours. This means that switch bounce is avoided. You can save a different message text for each edge.

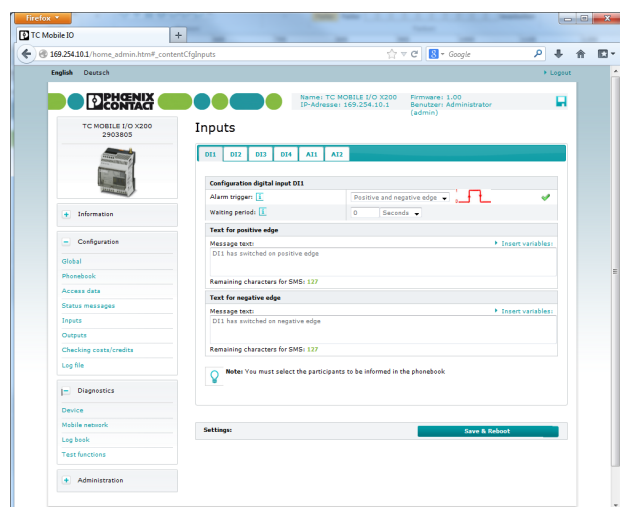


Figure 8 Digital inputs

Analog inputs

The device can send up to four messages per analog input:

- Exceeding the upper tolerance
- Falling below the upper tolerance
- Exceeding the lower tolerance
- Falling below the lower tolerance

You can use the analog inputs as voltage input (0 V ... 60 V) or as current input (0 mA ... 20 mA or 4 mA ... 20 mA). If a signal of 4 mA ... 20 mA is monitored, the device can report wire break behavior.

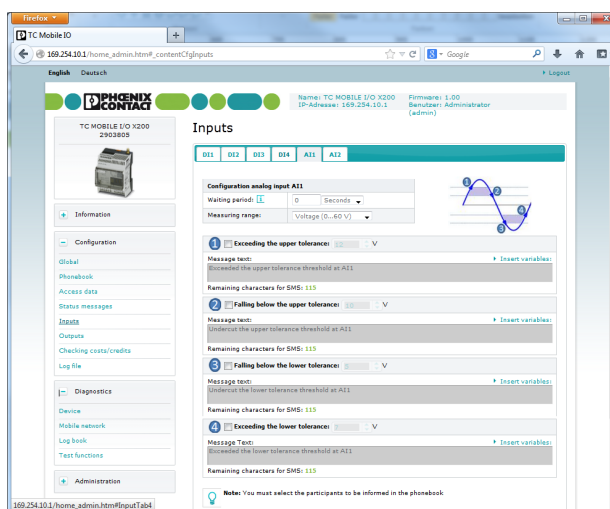


Figure 9 Analog inputs

Relays

The device has four relays (N/O contacts). You can open or close the relays per SMS. An SMS can also switch several relays at the same time. For security reasons, incoming e-mails are not supported.

If a relay has been closed, it can be automatically opened again after a freely selected waiting period of between one second and 999 hours.

The device can send a confirmation SMS to the recipient after a relay is opened or closed. In the case of a power outage, the relay is reset to its default setting (opened).

8.2 Messages

Alarm messages

The device sends alarm messages as SMS or e-mail. E-mails are sent to an SMTP server. The e-mails can be sent without encryption or with SSL encryption.

You are free to choose the text of the alarm message, and to add variables as well.

Example:

“... The input DI1 has the state: #DI1#...”
(#DI1# = Variable)

The firmware 1.0 supports the following variables:

- Device name
- Serial number of the device
- IMEI number of the device
- Time stamp of the current time
- Status of all four digital inputs (high = 1, low = 0)
- Status of the individual digital inputs (1 ... 4)
- Status of the individual analog inputs (1 ... 2)
- Status of all four relay outputs
- Status of the individual relay outputs (1 ... 4)
- Number of sent SMS messages
- Data volumes currently used
- Current network operator

Periodic status messages

In addition to alarm messages, the device can also send periodic status messages. The time interval can be between five minutes and one month.

Status message for power outage

The device can send a freely configurable SMS to a telephone book device when switched off, during a power outage, or when being started. The SMS is sent to the selected device once. It is not possible to send an e-mail because the power consumption is too high.

Status requests via SMS

You can request the current status of the inputs and outputs via SMS.

8.3 Diagnostics

You can see all the relevant diagnostics information in the “Device status” and “Mobile communication” areas. In this way, you can quickly check the function of the device.

Log book

The device contains a log book in which important events are recorded. The log book can hold up to a maximum of 100 entries. After these, the oldest entries are overwritten.

The contents of the log book can be sent automatically by e-mail:

- At overflow
- At regular intervals, e.g., once a week
- After an incoming SMS

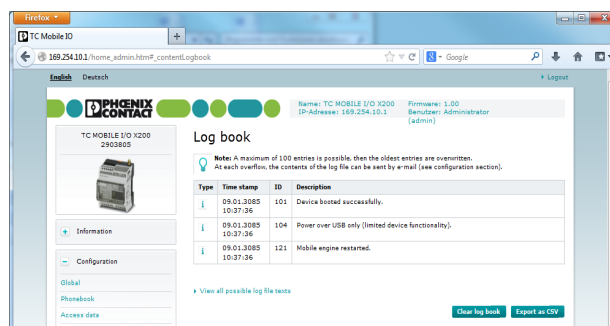


Figure 10 Log book



The contents of the log book are **not** saved during a power outage.

Test Functions

To check installation, you can execute the following actions using the web interface:

- Switch outputs
- Send test messages per e-mail
- Send test messages per SMS

Costs and credits

For an initial estimate of costs, you can receive alarm messages for the following events:

- Exceeding a defined number of SMS messages
- Exceeding a defined net data volume



The net data volume and the gross data volume (invoice of the mobile phone provider) can differ from one another. Calculation of the gross data volume is based on the mobile phone provider's individual invoicing system.

- Please consult with your mobile phone provider if necessary.

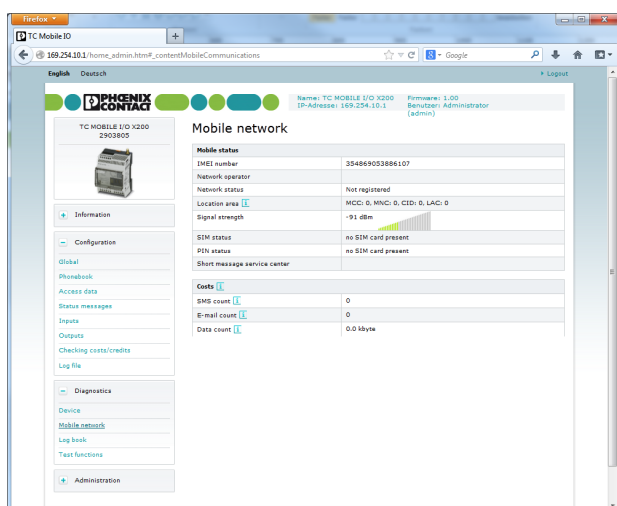


Figure 11 Monitoring costs and credits

8.4 Administration

As administrator, you also have the option of exporting or importing the device's configuration file. You can update the firmware or change the passwords if necessary. We recommend the current version of Firefox for the firmware update.

9 FCC approval

Declaration of Conformity



Responsible Party Name: Phoenix Contact
Address: 586 Fulling Mill Road
Middletown, Pa 17057

Representative Person's Name:

David E. Landis
Standards Technician
Americas Business Unit
Phone: (717) 944-1300 Ext. 3619
Fax: (717)-948-3468
E-mail: dlandis@phoenixcon.com

Product Name: TC MOBILE I/O X200
Ord-No.: 2903805

Product Name: TC MOBILE I/O X200 AC
Ord-No.: 2903806

Product Name: TC MOBILE I/O X300
Ord-No.: 2903807

Product Name: TC MOBILE I/O X300 AC
Ord-No.: 2903808

The above listed products conform to the following specifications:
FCC Part 15, Subpart B, Section 15.107(a) and Section 15.109(a), Class B Digital Device

Supplementary Information:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the 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.

This device contains:
FCC ID: QIPBGS2
IC: 7830A-BGS2

Grant of Equipment Authorization (QIPBGS2):

This device contains GSM functions that are not operational in the U.S. Territories. This filing is only applicable for U.S. operations.

This device is to be used in mobile or fixed applications only. Antenna gain including cable loss must not exceed 7.24 dBi in the 850 MHz Cellular band and 3.3 dBi in the PCS 1900 MHz band, for the purpose of satisfying the requirements of 2.1043 und 2.1091, 22-H, 24-E.

The antenna(s) used this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operated in conjunction with any antenna or transmitter not described under this FCC ID. The final product operating with this transmitter must include operating instructions and antenna installation instructions, for end-users and installers to satisfy RF exposure compliance requirements. This device is approved for use in specific co-located configurations in generic host platforms as described in this filing.

Compliance of this device in all final product configurations is the responsibility of the Guarantee. Installation of this device into specific final products may require the submission of a Class II permissive change application containing data pertinent to RF Exposure, spurious emissions, ERP/EIRP, and host/module authentication, or new application if appropriate.

FCC RF radiation Exposure Statement

This equipment complies with FCC RF exposure limits set forth for an uncontrolled environment. The antenna(s) used for this transmitter must be installed and operated with a minimum separation distance of 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter expect in accordance with the FCC multi-transmitter policy.

IC Statement:

CAN ICES-3 (B) / NMB-3 (B)

Antenna accessories

PSI-GSM-STUB-ANT 2313342
PSI-GSM-ANT-OMNI-2-5 2900982 2dBi gain
PSI-GSM/UMTS-QB-ANT 2313371