From Fault Detector to Intelligent Telecontrol PLC

The TO-PASS® product series makes it possible to monitor remote objects even in harsh environmental conditions at any time. The devices use the GSM mobile radio network and can communicate wirelessly without data lines or radio links.

Data can be sent to a user-selected destination, e.g., the WAGO Web portal, and easily accessed from any browser. Remote access ensures a high degree of system uptime, while simultaneously relieving service personnel from the burden of performing time-consuming, on-site inspections. With an appropriate GSM service provider contract, wireless connection is more efficient and cost-effective than a standard wired connection. TO-PASS® Compact modules can be commissioned via configuration tool without programming knowledge, serving as a convenient gateway into wireless communication and telecontrol technology.

Application: Error Message Monitoring

Error messages are recorded locally and reported via SMS, e-mail or fax. Conversely, outputs can be connected via SMS.

Application: Cyclic Monitoring

Process data is recorded cyclically, transmitted over the Web via GPRS and saved centrally. All options for analysis and further processing including engagement in the process are available.

Application: Detection and Object Tracking

Using GPS, TO-PASS® Mobile makes it possible to capture position and process values. This permits tracking of personnel and vehicles, trip monitoring, fleet management and much more.

Application: Intelligent Telecontrol PLC

The combination of intelligent data preprocessing with integration into the central TO-PASS® data storage provides optimal scalability for comprehensive support of even the most complex applications.

Data Collection/Distribution via Web Portal

The TO-PASS® Web Portal is an adaptive portal capable of identifying, saving in its own databank and independently visualizing values from the TO-PASS® Compact modules — no programming required. It makes it easy to view and manage data in a Web browser on the Internet.

Remote Parameterization

All TO-PASS® devices can also be configured remotely using the CSD service of the GSM network.

Integrated Position Determination

An integrated GPS receiver allows TO-PASS® Mobile devices to detect position within 20 meters and to manage this together with the actual process values. This can be helpful, for example, to record compliance of a cold chain for food transport on land and at sea without interruption.

Advantages:

• Very easy to use
• Versions for different requirements
• Parameterization without programming knowledge
• Great coverage and availability of the GSM network
• Data collection/distribution via Web portal
• Low ongoing mobile radio costs
• Optional: High degree of protection

High Degree of Protection

TO-PASS® Outdoor makes it possible to use the telecontrol modules even under difficult environmental conditions. The enclosure protects against moisture. An integrated UPS bridges power failures and can also, for example, send an error message. The option of integrating enclosure heating extends the unit's operating temperature range, opening it up to additional applications, such as wind power plants. Solar operation also ensures stand-alone use.

Approvals

TO-PASS® devices have a have a broad range of approvals for worldwide telephone networks. That means unrestricted applicability throughout the European Union. There are also approvals for Croatia, Turkey, Singapore, USA, Canada and Mexico. Approvals for other countries are available on request.
**TO-PASS® Telecontrol Technology**

**Versions**

**TO-PASS® Compact (A)**
- Compact telecontrol modules
- With integrated GSM modem
- With integrated I/Os in different configurations
- Message dispatch via SMS, e-mail, fax or over the phone
- Switching of outputs via SMS

**TO-PASS® Compact, Event/Process Memory Option (A)**
- Same as above
- Also local storage of all status changes
- Also local storage of all process values (cyclic, settable)

**TO-PASS® Compact, Web Option (B)**
- Same as above
- Additional GPRS: Permanent online connection to the process
- Allows cyclic data transmission to the TO-PASS® Web Portal
- Allows cyclic data transmission to a controller with a fixed IP address that receives and further processes the data using the TO-PASS® Web Connector (see Application Notes)
- Allows cyclic data transmission to any PC with a fixed IP address equipped with the TO-PASS® communication protocol.

**TO-PASS® Compact, MODBUS option (C)**
- Same as above
- Additional option for reading in data via MODBUS, e.g., from the WAGO 750 I/O-SYSTEM
- Connection via RS-232 or RS-485 depending on the version

**TO-PASS® Mobile (D)**
- Like TO-PASS® Compact
- Additional option for position determination via GPS
**TO-PASS® Telecontrol Technology**

**Item Number Key**

Explanation of the components of an item number key

<table>
<thead>
<tr>
<th>Series</th>
<th>Item No.: 761-(x)xxx</th>
</tr>
</thead>
<tbody>
<tr>
<td>1xx:</td>
<td>Compact telecontrol module with 4DI, 4DO</td>
</tr>
<tr>
<td>2xx:</td>
<td>Compact telecontrol module with 8DI, 4DO, 8AI, 2AO</td>
</tr>
<tr>
<td>3xx:</td>
<td>Mobile telecontrol module with 4AI</td>
</tr>
<tr>
<td>x10:</td>
<td>standard</td>
</tr>
<tr>
<td>x11:</td>
<td>Additional 2 AI</td>
</tr>
<tr>
<td>x12:</td>
<td>Additional Web option</td>
</tr>
<tr>
<td>x13:</td>
<td>Additional 2 AI + Web option</td>
</tr>
<tr>
<td>114:</td>
<td>Additional 2 AI + Web option + MODBUS RS-485</td>
</tr>
<tr>
<td>214:</td>
<td>Additional event logger, data logger option</td>
</tr>
<tr>
<td>x16:</td>
<td>Additional Web option + MODBUS RS-232</td>
</tr>
<tr>
<td>x17:</td>
<td>Additional Web option + MODBUS RS-232</td>
</tr>
</tbody>
</table>

9009: Outdoor unit (without telecontrol module)
TO-PASS® Telecontrol Technology
Interfaces and Types

**TO-PASS® Compact (A)**
- Slot for SIM card (a)
- Antenna connection (b)
- RS-232/-485 serial interface (c)
- I/O connection level (d)
- W x H x D (mm) 109 x 105 x 78
  Height from upper edge of DIN-rail

**TO-PASS® Mobile (B)**
- Like TO-PASS® Compact
- Additional antenna connection for GPS receivers (a)

**TO-PASS® Outdoor (C)**
- Compact unit for mounting telecontrol modules in an IP66 enclosure
- Integrated GSM antenna
- 230 VAC supply voltage
- Power failure protection by batteries
- Option: Temperatures down to ~4 °C are possible with built-in heater
- Also available for self-sustaining solar operation
- W x H x D (mm) 280 x 130 x 310
  incl. cable grips
**TO-PASS® Telecontrol Technology**

**Application and Installation Instructions**

**Manage Data with TO-PASS® Web Portal**

The TO-PASS® Compact and TO-PASS® Mobile device versions with Web functionality are able to transmit data cyclically to a central Webserver. The process image (i.e., states and values of all digital and analog inputs) is transmitted to the Webserver with a timestamp at a variable configurable interval and then stored in a database. Standard data loggers and the cumbersome process of reading out data are no longer necessary.

The TO-PASS® Web Portal can be used as a Webserver.

In addition to simple data storage, it provides password-protected visualization with current process data representation and chart recorder for measured value history. Controlling and managing your data is simplified by using an Internet browser via www.to-pass.com. More information on the TO-PASS® Web Portal is available in Section 1.

**Forward Data with TO-PASS® Web Connector**

The TO-PASS® Web Connector function block is available for easy integration of fault detectors in the control system. Error and event messages are transmitted by GPRS data string via HTTP to a WAGO controller with a fixed IP address. These in turn are capable of passing the data to a central control system via different communication protocols (e.g., MODBUS TCP, BACnet, IEC telecontrol protocols).

Refer to Section 3 for suitable controllers.

**Intelligent, Decentral Data Preprocessing**

The controller with integrated mobile modem is recommended for telecontrol tasks requiring on-site control. Prepared function blocks are available for communication with the TO-PASS® Web Portal. These intelligent telecontrol stations can also be fully integrated in the TO-PASS® infrastructure for seamlessly adapting into the application environment.

Information on WAGO 750 I/O-SYSTEM controllers is available in Section 3.
## TO-PASS® Telecontrol Technology
### Standards and Rated Conditions

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>10–30 VDC</td>
</tr>
<tr>
<td>Ambient temperature (operation)</td>
<td>-20...+70 °C</td>
</tr>
<tr>
<td>Ambient temperature (storage)</td>
<td>-40...+85 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>95%, without condensation</td>
</tr>
<tr>
<td>Operating altitude</td>
<td>0...2000 m</td>
</tr>
<tr>
<td>Altitude at storage/transport</td>
<td>0...15000 m</td>
</tr>
<tr>
<td>Pollution degree</td>
<td>2 per IEC 61131-2</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>4 g acc. IEC 60068-2-6</td>
</tr>
<tr>
<td>Shock resistance</td>
<td>15 g per IEC 60068-2-27</td>
</tr>
<tr>
<td>EMC immunity to interference</td>
<td>Per EN 61000-6-2</td>
</tr>
<tr>
<td>EMC emission of interference</td>
<td>Per EN 61000-6-3</td>
</tr>
<tr>
<td>Protection type</td>
<td>IP20</td>
</tr>
<tr>
<td>Mounting type</td>
<td>On 35 mm DIN-rail</td>
</tr>
<tr>
<td>Mounting position</td>
<td>Any</td>
</tr>
<tr>
<td>Connection technology: Antenna</td>
<td>SMA socket</td>
</tr>
<tr>
<td>Connection technology: Inputs/outputs</td>
<td>250 Series Terminal Blocks with PUSH WIRE® connection</td>
</tr>
<tr>
<td>Conductor size; strip length</td>
<td>0.5–1.5 mm² / 22–14 AWG; 9–10 mm / 0.35–0.39 inch</td>
</tr>
</tbody>
</table>

### Approvals

Overview of the approvals in the article comparison in Section 12, Technical Appendix, or online under www.wago.com