WAGO-I/O-SYSTEM 750
MP-Bus-Master-Modul, 750-643
Connection of an MP-Bus Actuator

Version 1.0.1
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Number Notation

Table 1: Number Notation

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<tr>
<th>Number code</th>
<th>Example</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decimal</td>
<td>100</td>
<td>Normal notation</td>
</tr>
<tr>
<td>Hexadecimal</td>
<td>0x64</td>
<td>C notation</td>
</tr>
<tr>
<td>Binary</td>
<td>'100'</td>
<td>In quotation marks, nibble</td>
</tr>
<tr>
<td></td>
<td>'0110.0100'</td>
<td>separated with dots(.)</td>
</tr>
</tbody>
</table>

Font Conventions

Table 2: Font Conventions

<table>
<thead>
<tr>
<th>Font type</th>
<th>Indicates</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>italic</em></td>
<td>Names of paths and data files are marked in italic-type.</td>
</tr>
<tr>
<td></td>
<td>e.g.: <code>C:\Programme\WAGO-I/O-CHECK</code></td>
</tr>
<tr>
<td><strong>Menu</strong></td>
<td>Menu items are marked in bold letters.</td>
</tr>
<tr>
<td></td>
<td>e.g.: <em>Save</em></td>
</tr>
<tr>
<td>&gt;</td>
<td>A greater-than sign between two names means the selection of a menu item</td>
</tr>
<tr>
<td></td>
<td>from a menu.</td>
</tr>
<tr>
<td></td>
<td>e.g.: <em>File &gt; New</em></td>
</tr>
<tr>
<td><strong>Input</strong></td>
<td>Designation of input or optional fields are marked in bold letters,</td>
</tr>
<tr>
<td></td>
<td>e.g.: <strong>Start of measurement range</strong></td>
</tr>
<tr>
<td>&quot;Value&quot;</td>
<td>Input or selective values are marked in inverted commas.</td>
</tr>
<tr>
<td></td>
<td>e.g.: Enter the value “4 mA” under <strong>Start of measurement range</strong></td>
</tr>
<tr>
<td><strong>[Button]</strong></td>
<td>Pushbuttons in dialog boxes are marked with bold letters in square</td>
</tr>
<tr>
<td></td>
<td>brackets.</td>
</tr>
<tr>
<td></td>
<td>e.g.: <strong>[Input]</strong></td>
</tr>
<tr>
<td><strong>[Key]</strong></td>
<td>Keys are marked with bold letters in square brackets.</td>
</tr>
<tr>
<td></td>
<td>e.g.: <strong>[F5]</strong></td>
</tr>
</tbody>
</table>
## Symbols

### DANGER

**Personal Injury!**
Indicates a high-risk, imminently hazardous situation which, if not avoided, will result in death or serious injury.

### DANGER

**Personal Injury Caused by Electric Current!**
Indicates a high-risk, imminently hazardous situation which, if not avoided, will result in death or serious injury.

### WARNING

**Personal Injury!**
Indicates a moderate-risk, potentially hazardous situation which, if not avoided, could result in death or serious injury.

### CAUTION

**Personal Injury!**
Indicates a low-risk, potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

### NOTICE

**Damage to Property!**
Indicates a potentially hazardous situation which, if not avoided, may result in damage to property.

### NOTICE

**Damage to Property Caused by Electrostatic Discharge (ESD)!**
Indicates a potentially hazardous situation which, if not avoided, may result in damage to property.

### Note

**Important Note!**
Indicates a potential malfunction which, if not avoided, however, will not result in damage to property.
Information

Additional Information:
Refers to additional information which is not an integral part of this documentation (e.g., the Internet).

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**Version 1.0.1**
1 Description

This application note describes how a WAGO fieldbus controller builds communication to the MP-Bus actuators using the 750-643 MP-Bus Master Module.

The sample program shows not only the option of addressing the MP-Bus actuators, but also the cyclical communication with actuators already addressed.

2 Used material

2.1 Libraries

<table>
<thead>
<tr>
<th>Library</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WagoAppMP_Bus</td>
<td>MP-Bus Bibliothek</td>
</tr>
</tbody>
</table>

2.2 Devices

<table>
<thead>
<tr>
<th>Provider</th>
<th>Quantity</th>
<th>Description</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAGO</td>
<td>1</td>
<td>Controller PFC100; 2 x ETHERNET</td>
<td>750-8101</td>
</tr>
<tr>
<td>WAGO</td>
<td>1</td>
<td>MP-Bus-Master</td>
<td>750-643</td>
</tr>
<tr>
<td>WAGO</td>
<td>1</td>
<td>Endmodul</td>
<td>750-600</td>
</tr>
<tr>
<td>BELIMO</td>
<td>1</td>
<td>MP-Bus Stellantrieb</td>
<td>SM24A-MP</td>
</tr>
</tbody>
</table>

2.3 Tools

<table>
<thead>
<tr>
<th>Description</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>e!COCKPIT; Workstation License</td>
<td>2759-101/1110-2002</td>
</tr>
</tbody>
</table>
3 Setup

Fig. 1: Connection diagram

**Note**

Communication Cable!

The communication cable, which is shown in Fig. 1, is an alternative way to establish a connection between the PC and the WAGO controller.
4 Control of an MP-Bus Actuator

**NOTICE**

Installation of Sample Projects for *e!COCKPIT*

Sample programs can be called up from the *e!COCKPIT* Backstage view by clicking the **Updates & Add-ons** button in the navigation bar.

### 4.1 Task

An actuator with MP-Bus interface is to be controlled with the WAGO-I/O-SYSTEM. For this, the actuator is connected to the WAGO-I/O-SYSTEM, using an MP-Bus master module (see illustration 1). A PT1000 resistor is also connected to the actuator for the additional evaluation of the channel temperature, for example. How to program the application is described briefly below.
4.2 Programming

```plaintext
1 PROGRAM PLC_PRG
2 VAR
3 //Function block for communicating with the WAGO MP-Bus module 750-643
4 MPBusMaster : FbMpbusMaster;
5 bModuleNumber : BYTE := 1;
6 sStatusMaster : STRING;
7

Fig. 3: Communication with MP-Bus master module
```

Figure 2 shows the basic structure for the programming of an MP-Bus application. Prerequisites for the communication with the MP-Bus actuator are a 750-643 MP-Bus Master Module and the `FbMpbusMaster` function block.

At the `FbMpBusMaster` function block, the Description of the MP-Bus Master Module, which can be found and edited in the device structure, must be indicated at the “I_Port” input.

```

Fig. 4: Device structure - e!COCKPIT
```
The module index of the connected MP-Bus module must be indicated at the "bPortMpBus" input (first MP-Bus module => 1, second MP-Bus module => 2, etc.). The last occurred error message is displayed at the output "sStatus" as a string variable.

**Note**

**Master function block!**
For each MP-Bus master module, the **FbMpBusMaster** function block may be addressed only once. The assignment of the MP-Bus function blocks to the corresponding MP-Bus master function block is performed using the input "bPortMpBus".

Using the **FbMpBusAddressing** function block, a unique MP-Bus address can be assigned to the connected MP-Bus actuator. Addressing can be performed in two different ways:

1. **Addressing the MP-Bus actuator by pressing the service pin**
2. **Addressing the MP-Bus actuator by entering the serial number**

To address the MP-Bus actuator via the service pin, the "xSet" input must be set to TRUE, and subsequently the service pin on the MP-Bus actuator must be actuated. Then, the actuator is assigned the address of the "bAddress" variable.

When addressing the MP-Bus actuator using the serial number, the actuator serial number is entered at the "typINSerialNo" structure variable. Then, the actuator can be addressed via the "xSet" input.
Addressing via visualization!
Addressing the MP-Bus actuator is facilitated by the visualization interface described in chapter 5.

![Diagram showing the FbMpBusDamperAndLinearActuator function block instance for controlling SM24A-MP rotary damper actuator.]

The `FbMpBusDamperAndLinearActuator` function block instance is used for scanning and controlling the SM24A-MP rotary damper actuator.

The send and scan process is initiated via the "xEnable" input. Subsequently, the communication with the actuator is cyclical and depends on the "tCycleTime" parameter.

The set point value of the angle of rotation of the damper actuator is preset by the "rPosition" input and sent to the actuator. The current actual position of the actuator is sent back by the actuator and displayed at the "rOutPosition" output.

Using the "bSensorType" input, the sensor type is selected, PT1000 in our example. The resistance value measured by the actuator is then displayed at the "wSensorValue" output. Via the `Fu_PT1000` function, the measured resistance value is converted to a temperature value.
5 Visualization Interface

Fig. 7: Visualization interface for commissioning an MP-Bus actuator.

Addressing as well as communication with the damper drive is graphically shown in the visualization interface.

For addressing the actuator, the actuator serial number can be entered in the white fields to the left side. The visualization also offers the option to start addressing the actuator using the service pin.

The right section of the visualization interface provides space for the parameter setting of the communication with the damper actuator. In addition, the values acquired from the damper actuator are visually represented.