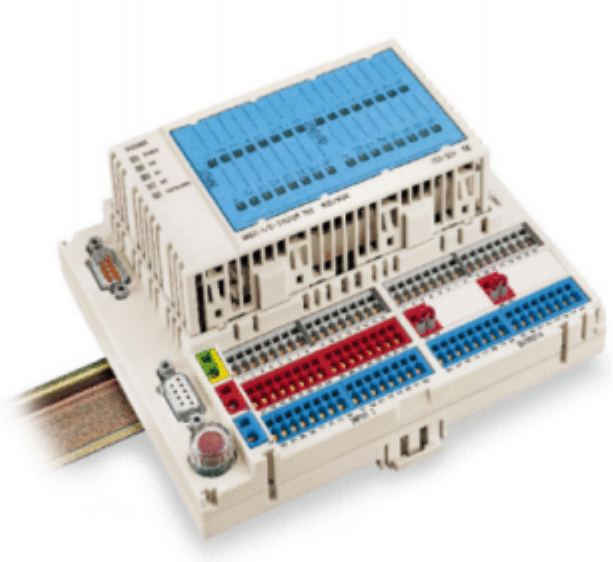
WAGO I/O SYSTEM 752

# Fieldbus Dependent I/O Module

# INTERBUS



# Manual

Technical Description,
Installation and
Configuration

752-122/000-002
Version 1.0.0

WAGO®
INNOVATIVE CONNECTIONS

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Every conceivable measure has been taken to ensure the correctness and completeness of this documentation. However, as errors can never be fully excluded we would appreciate any information or ideas at any time.

We expressively point out that the software and hardware designations and brand names of individual companies used in this manual are subject to general trade name, trademark or patent protection.

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# 1 Important Explanations

To allow the user fast installation and commissioning of the units described in this manual it is necessary to attentively read and observe the following notes and explanations.

## 1.1 Legal Basis

### 1.1.1 Copyright

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### 1.1.2 Personnel Qualification

The use of the product described in this manual is solely intended for qualified persons trained in PLC programming, qualified electricians or persons instructed by qualified electricians who are also familiar with the applicable standards and directives. WAGO Kontakttechnik declines all liability for faulty operation and damages to WAGO products and products from other suppliers resulting from non-observance of the information contained in this manual.

### 1.1.3 Intended Use

For the individual application, the components are supplied with a defined hardware and software configuration. Changes are only admitted within the framework of the possibilities documented in the manuals. All other changes to the hardware or software and any use of the components other than that intended entail the exclusion of liability on part of WAGO Kontakttechnik GmbH.

Please contact WAGO Kontakttechnik GmbH for any wishes in terms of a modified or a new hardware or software configuration.

## 1.2 Scope of Validity

This manual describes the fieldbus dependent I/O module of the WAGO-I/O-SYSTEM 752 for the INTERBUS.

| Components | Article No. |
|---|---|
| Electronic module<br>Base module | 752-324<br>752-824 |

## 1.3 Symbols

**Warning**
Observe this information in all cases to protect the system from damage.

**Attention**
Marginal conditions to be observed in all cases to ensure a troublefree operation.

**ESD** (Electrostatic Discharge)
Warning of danger to the components by electrostatic discharge. Precautionary measure when handling components subject to electrostatic discharges.

**Further information**
Reference to additional literature, manuals, data sheets and INTERNET pages.

## 1.4 Abbreviations

| | |
|---|---|
| **BA** | Bus Active |
| **DI** | 1. Digital input<br>2. Data In (interface pin designation) |
| **DO** | 1. Digital output<br>2. Data Out (interface pin designation) |
| **DS** | Diagnostic status |
| **I/O** | Input / Output |
| **ID** | Identifier, Identification |
| **RBST** | Pin for plug recognition |
| **RC** | Remote connected |
| **RD** | Remote disconnected |

# 2 System Description

The WAGO-I/O-SYSTEM 752 for INTERBUS is part of the compact series of WAGO field bus nodes for distributed automation. It has a fixed number of digital inputs (DI) and digital outputs (DO) and transmits the signals to a higher ranking control system via INTERBUS.

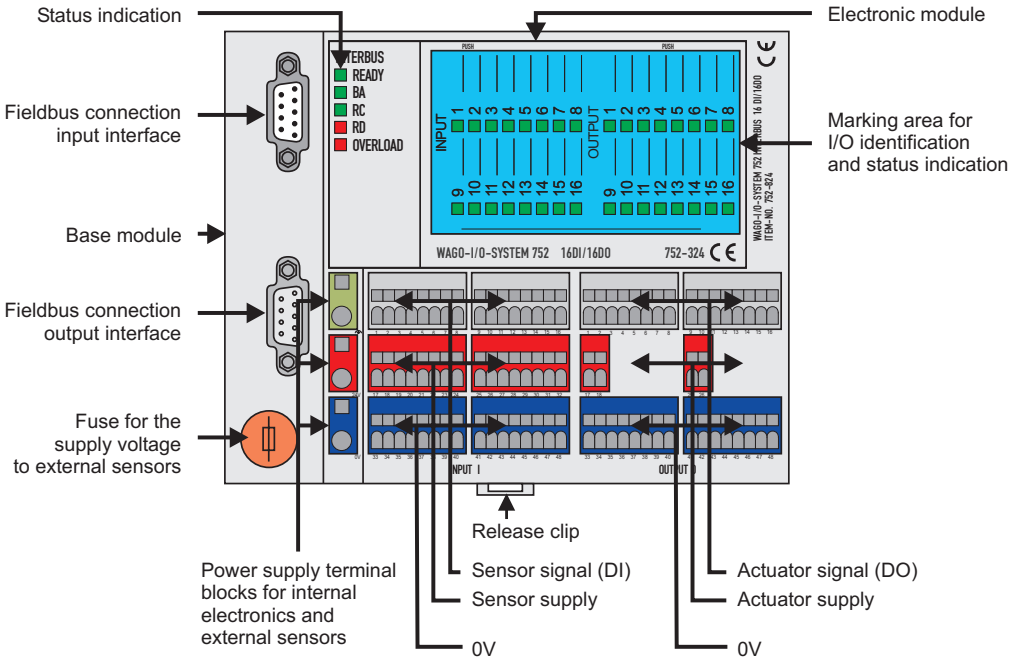



Fig. 2-1: I/O module for INTERBUS g1x2401e

The fieldbus dependent I/O module consists of

- the **base module** allows prewiring of the fieldbus, power supply, and sensor/actuator connections.
- the plug-in **electronic module** contains the processing unit, the fieldbus interface module, and the input and output circuits.

The electronic and base modules are supplied separately packed.

## 2.1 Base Module

The base module is the interface for all external wiring, including the fieldbus, power supply, and sensor/actuator connections. A multi-conductor connector links the external wiring to the plug-in electronic module.

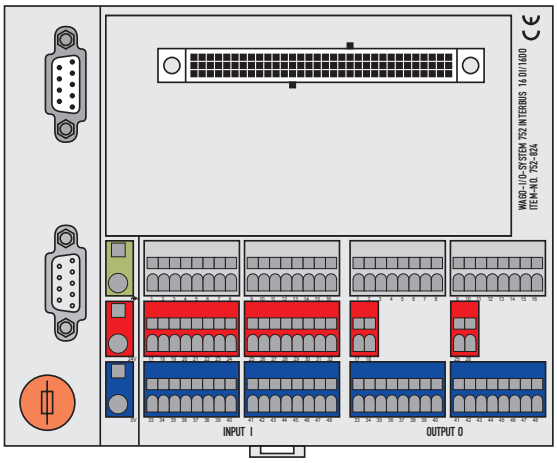



Fig. 2-2: Base Module g1x2406x

- Fieldbus connection, 2 x 9 pole D-SUB
- Module power supply,
  terminal block with CAGE CLAMP® 2.5 mm² connection
- Sensor connection,
  3 conductors, terminal block with CAGE CLAMP® 1.5 mm² connection
- Actuator connection,
  2 conductors, terminal block with CAGE CLAMP® 1.5 mm² connection
- Separate output supply voltage,
  terminal block with CAGE CLAMP® 1.5 mm² connection
- Fuse holder with protective cap for input supply voltage fuse.
- Clear labeling of the connection group (INPUT or OUTPUT) and each individual terminal block (numbered)
- Wiring can be performed independent of the plug-in electronic module.

## 2.2 Electronic Module

The plug-in electronic module includes all electronic circuits, i. e. the power pack, the electrically isolated fieldbus interface module, the processing unit, the input and output circuits, and their corresponding status indicators.

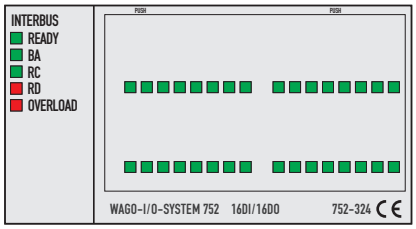



Fig. 2-3: Electronic Module g1x2407x

- Plug-in design provides easily installation into the base module.
- If a replacement of the electronic module is necessary, the wiring remains undisturbed.
- Status indicators for fast diagnostics.

The electronic module includes a marking label for input/output identification.

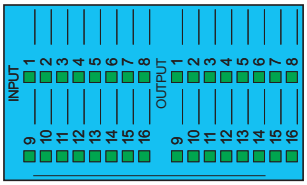



Fig. 2-4: Marking label g1x2408x

Text can be added to the marking label using a permanent felt tip pen (order no. 210-110), or can be labeled by means of a plotter or a laser printer. The WAGO SCRIPT marking system has templates available for easy and professional customization of marking labels.

# 3 Technical Data

| INTERBUS System data | |
|---|---|
| Number of nodes | 256 (depends on master) |
| Number of I/O points | 4096 inputs (depends on master)<br>4096 outputs (depends on master) |
| Transmission medium | certified Cu cable |
| Max. length of fieldbus segment | 400 m |
| Baud rate | 500 kbaud |
| Buscoupler connection | 9 pole D-SUB male, input interface<br>9 pole D-SUB female, output interface |
| Type of I/O modules | remote bus device<br>ID code: 0x03<br>amount of data: 32 bit |

| Supply | |
|---|---|
| Supply voltage | DC 24 V (– 15 % / + 20 %) |
| Current input<br>(module without load) | < 100 mA for 24 V DC |
| Total loss of power | < 4.5 W |
| Fuse F1 for sensor supply | TR5 250 V / 6.3A T |

| General information | |
|---|---|
| Dimensions W x H x L | (155 x 129 x 60*) mm |
| Housing material | polycarbonate |
| Fixing | Snap mounting onto 35 DIN carrier rail<br>EN 50022-35 |
| Fitting position | vertical and horizontal |
| Weight | approx. 500 g |

* from upper edge of DIN 35 rail

| Wire connection | |
|---|---|
| Power supply | CAGE CLAMP®<br>0.08 mm² ... 2.5 mm², AWG 28-12* |
| Sensors, actuators | CAGE CLAMP®<br>0.08 mm² ... 1.5 mm², AWG 28-16 |
| Supply voltage for<br>outputs (8 circuit group) | CAGE CLAMP®<br>0.08 mm² ... 1.5 mm², AWG 28-16 |

* AWG12: THHN, TWHN

| Inputs | |
|---|---|
| Number of inputs | 16 |
| Input | in accordance with EN 61131-2, type 1 |
| Wire connection | for 3 conductors |
| Signal voltage (0) | DC –3 V ... +5 V |
| Signal voltage (1) | DC 15 V ... 30 V |
| Time constant | 5 ms |
| Insulation electronics/field side | none |

| Outputs | |
|---|---|
| Number of outputs | 16 |
| Rated voltage | DC 24 V |
| Rated current<br>– max. per output<br>– max. per group (8 outputs)<br>– max. per module 16 DO | <br>500 mA<br>4 A<br>8 A |
| Leakage current | < 2 mA |
| Short circuit protection | electronic, automatic restart |
| Max. operating frequency (without bus)<br>– resistive load<br>– inductive load | <br>1 kHz<br>utilization category DC 13, equals 6 Hz |
| Insulation electronics/field side | none |
| Diagnosis | Short circuit display by LED (OVERLOAD) for the entire module; signaling via bus for 4 outputs each |
| Feeding | • all through supply terminal blocks 24 V, 0 V, ⏚ with plugged jumpers<br>• in groups via supply terminal blocks for 8 outputs each |

| Degree of Protection | |
|---|---|
| Degree of protection according to EN 60 529 | IP 20 protection against physical contact with standard test probes |

| Conformity and Certification | |
|---|---|
| Conformity labelling | CE |
| UL | E175199, UL 508 |

| Climatic Environmental Conditions | |
|---|---|
| Operating temperature | 0 °C ... 55 °C |
| Storage temperature | -25 °C ... +70 °C |
| Relative air humidity | 10 ... 45 % , no dew formation |
| Air pressure in operation | 86 ... 106 hPa |
| Maximum altitude | max. 2000 m above sea level |
| Strain by harmful substances | Inspection according to IEC 60068-2-42 and IEC 60068-2-43 |
| Special conditions | Exercise caution when subjecting the I/O modules to the following conditions:<br>– dust, corrosive vapors or gasses<br>– ionized radiation. |

| Mechanical Strength | |
|---|---|
| Vibration | According to IEC 60068-2-6, inspection Fc<br>10 ... 57 Hz constant amplitude 0.075 mm<br>57 ... 150 Hz constant acceleration 1 g |
| Impact | According to IEC 60068- 2-27; 15 g, 11 ms |

| Electrical Safety | |
|---|---|
| Reverse voltage protection | Yes |
| Air and creepage distances | According to DIN EN 61131-2 and DIN EN 50178 between current circuits and body as well as between electrically isolated, separate current circuits, according to over-voltage category II, degree of pollution 2 |
| Isolation | Yes, between fieldbus and internal electronics |
| Test voltage | DC 500 V |

| Electromagnetic Compatibility | | | |
|---|---|---|---|
| Interference Resistance according to EN50082-2 : 1995 | | | |
| EN 61000-4-2 | 4 kV / 8 kV | (2/4) | B |
| EN 61000-4-3 | 10 V/m 80% AM | (3) | A |
| EN 61000-4-4 | 2 kV | (3/4) | B |
| EN 61000-4-6 | 10 V/m 80% AM | (3) | A |
| Interference emission according to EN50081-2 : 1994 | | | |
| EN 55011 | 30 dBµV/m | (30 m) | |
| | 37 dBµV/m | | |

| Dimensions / Distances |
|---|

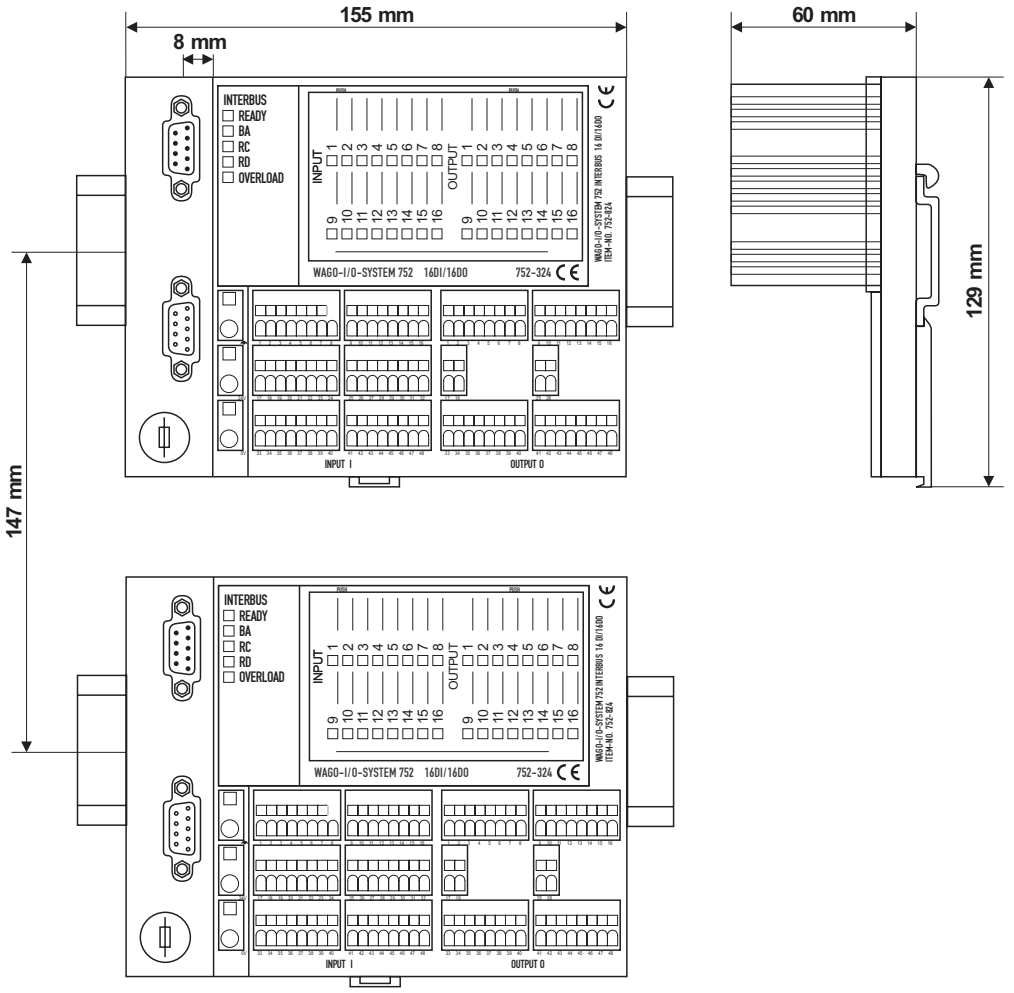



Fig. 3-1: Dimensions

g1x2410x

| Distances to building walls | |
|---|---|
| RH / LH: | 0 mm |
| Top: | 20 mm |
| Bottom: | 20 mm |
| Front: | 0 mm when fitted<br>150 mm fitting space |

**Attention**

The distances between I/O module(s) and building walls have to be observed in order to guarantee sufficient ventilation.

# 4 Installation

## 4.1 Mechanical Installation

### 4.1.1 Snapping on / Detaching the Base Module

The WAGO-I/O-SYSTEM 752 is intended for mounting on a TS35 type carrier rail. The base module snaps onto the carrier rail, as shown in Fig. 4-1.

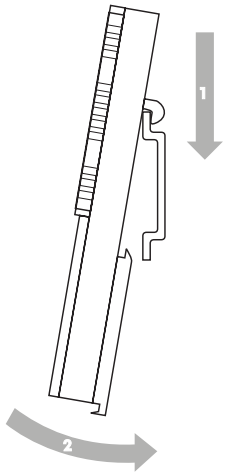



Fig. 4-1: Snapping the base module onto the carrier rail g1xxx08x

The module can be detached from the carrier rail by releasing the latch using a suitable tool (screw driver), as shown in Fig. 4-2.

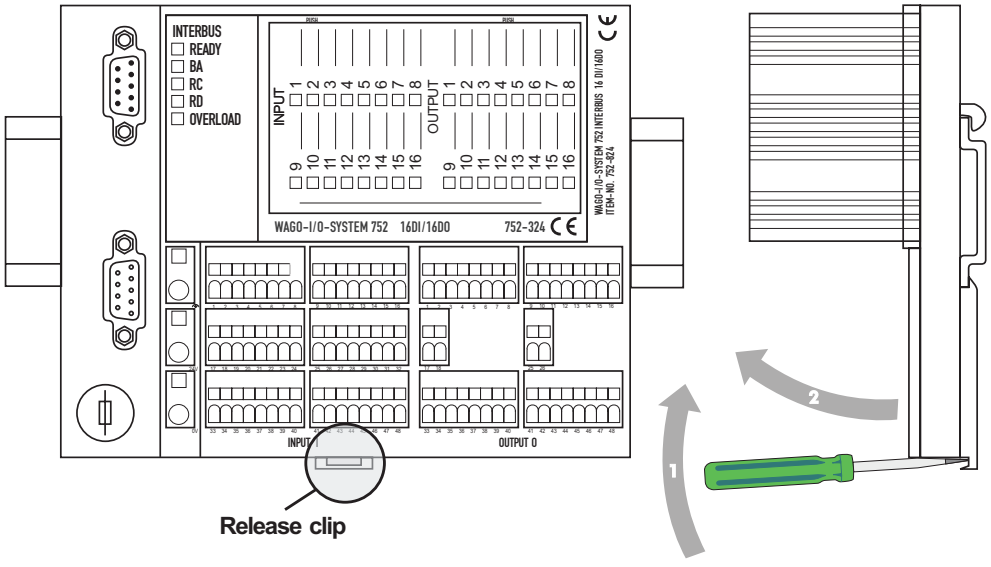



Fig. 4-2: Detachment of the I/O module from the carrier rail g1x2411e

## 4.1.2 Insertion/Extraction of the Electronic Module

The electronic module is plugged onto the base module.

**Attention**
Remove power from the base module before installing the electronic module.

Apply force at the positions marked “PUSH” in Fig. 4-3 when plugging in the electronic module.

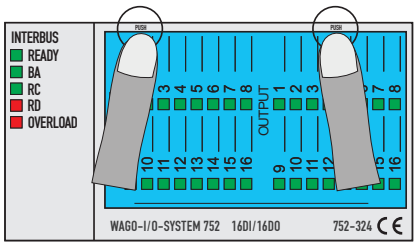



Fig. 4-3: Plugging in the electronic module g1x2402x

The electronic module is correctly inserted when all four latches have engaged.

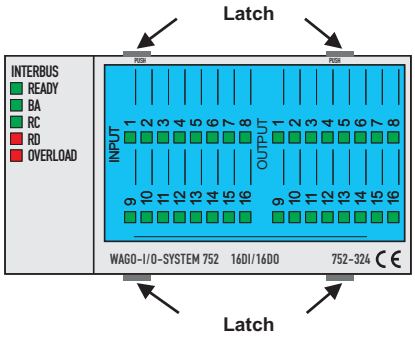



Fig. 4-4: Extracting the electronic module g1x2403d

The electronic module can be extracted by pressing the 4 latches and simultaneously pulling it from the base module.

## 4.1.3 Marking Label

The plastic marking label can be removed from the mounting points by applying slight finger force. To accomplish this, slide the label from one side such that the label bends.

Insert the label by proceeding in the reverse order.

# 4.2 Electrical Installation

## 4.2.1 General

**ESD** (Electrostatic Discharge)
The components are equipped with electronic components susceptible to be destroyed when exposed to electrostatic load. Therefore, when handling these components, ensure proper grounding of the surrounding objects and persons (workplace, packing). Avoid contact with electrically conductive components, e. g. the pins of a plug.

All connecting terminal blocks for the supply voltages and sensor and actuator connections are equipped with CAGE CLAMP® connectors.

These CAGE CLAMP® connectors are suitable for fine-stranded and solid conductors. When using ferrules, select the next smaller nominal cross section for the conductor.

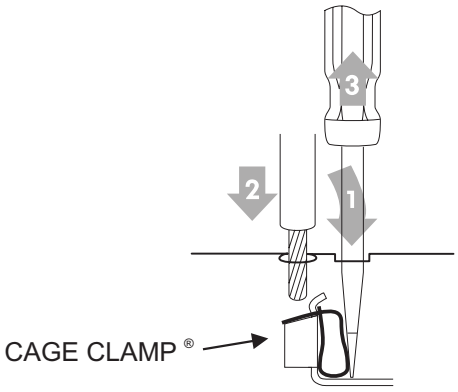



Fig. 4-5: How to operate the CAGE CLAMP® g1xxx10x

The WAGO-I/O-SYSTEM 752 requires a 24 V DC supply.

The sensors supply voltage is short circuit protected by means of the plug-in fuse F1 (TR 5 / 250 V / 6.3A T).

**Note**
Use UL-Recognized fuse only

The supply voltage for the outputs can be fed through the module, or sourced separately.

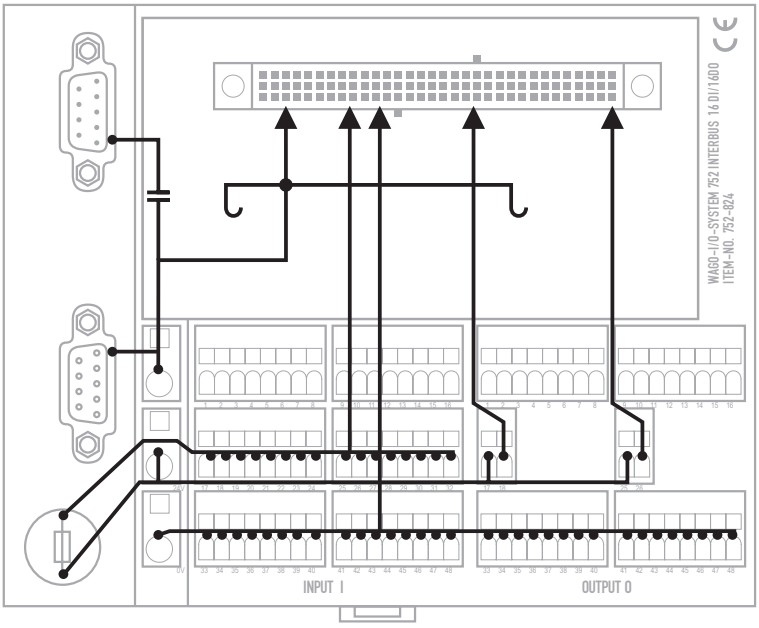



Fig. 4-6: Power supply g1x2400x

Two carrier rail contacts are provided on the underside of the base module to ensure electrical contact between the grounded carrier rail and the I/O module. The contacts are directly connected to the ⏚ terminal block.

**Note**
Ensure that solid contact is made between the carrier rail contact on the underside of the base module and the carrier rail itself.
The carrier rail must be grounded.

## 4.2.2 Connection of the Module Supply Voltage

The connection of the module supply voltage and earth ground is made on terminal blocks carrying the following labeling:

- 24V (red terminal block)
- 0V (blue terminal block)
- ⏚ (green terminal block)

Connection of earth ground to the base module's ground terminal is required for reliable module operation.

## 4.2.3 Connection of the Input Signals

The input signal connection group is identified by the imprint “INPUT” on the base module. Three terminals are available for each digital input. The terminals for one input are shown superimposed in Fig. 4.7.

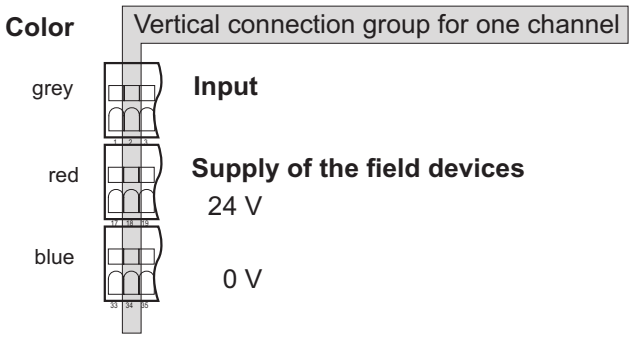



Fig. 4-7: Sensor connection g1xxx03e

2-conductor sensors, e. g. switches, are connected to the grey and red terminal blocks.
3-conductor sensors receive their 24 VDC supply voltage through the connection to the red and the blue terminal blocks. The output signal of the 3-conductor sensor is connected to the grey terminal block.

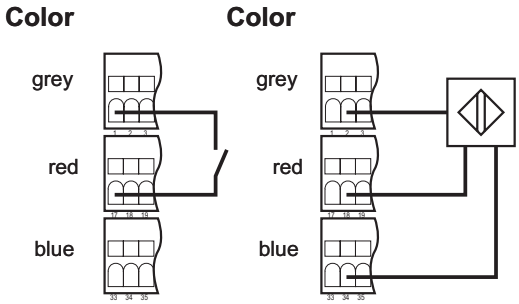



Fig. 4-8: Examples of a sensor connection g1xxx04e

## 4.2.4 Connection of the Output Supply Voltage

The supply voltage for the two output groups of 8 connections each can be provided either internally using the supply voltage for the module, or externally from a separate power source. The base modules are provided with two sets of terminal blocks in the middle row of the output terminals. The left-hand terminal of each set carries the 24VDC module power, while the right-hand terminal provides a connection point for the output supply voltage.

The base modules are shipped with jumpers installed in each of these terminals, connecting 24VDC module power to connection point for the output supply voltage.

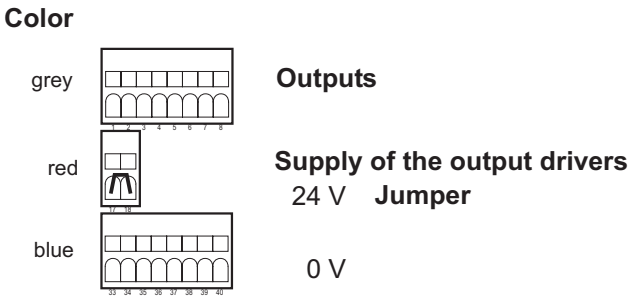



Fig. 4-9: Output supply voltage, internal g1xxx05e

The factory-installed jumper has to be removed when a separate power supply for a group of 8 digital outputs is required. The separately fused or switchable power supply is connected to the right-hand connection point.

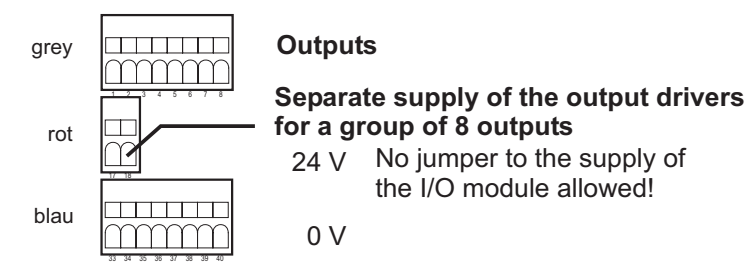



Fig. 4-10: Output supply voltage, separate g1xxx06e

**Note**
When providing a separate output supply voltage to a group of 8 outputs, the supply voltage common must be terminated on the base module using the 0 V potential of the WAGO-I/O-SYSTEM 752 (blue terminal block).The entire current load is applied to the common terminal connection.

If more than 6 Amps is applied to the common terminals, separate terminal blocks should be used. Connect all common connections to the terminal blocks, and then connect the 752 common to the terminal blocks. This row of terminal blocks will be wired back to the source common of the supply potential.

## 4.2.5 Connection of the Output Signals

The output signal terminals are identified by the imprint “OUTPUT” on the base module.

Two terminals are available for each digital output. The terminals for one output are shown superimposed in Fig. 4-11.

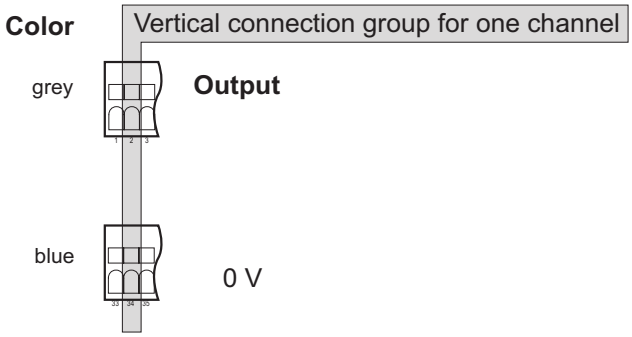



Fig. 4-11: Actuator connection g1xxx07e

The positive connection of an actuator is wired to the grey output terminal block. The negative connection of an actuator is wired to the blue output terminal block.

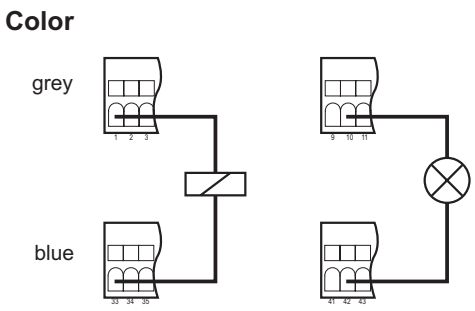



Fig. 4-12: Examples of an actuator connection g1xxx09e

## 4.2.6 Connection of the Fieldbus Interface

The WAGO-I/O-SYSTEM 752 for INTERBUS is provided with two 9 pole D-SUB plug connectors for interfacing to the INTERBUS network.

**Input interface**: 9 pole D-Sub (male)

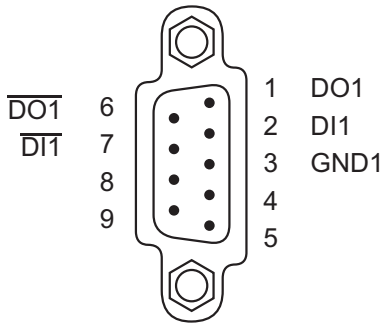



Fig. 4-13: "Plug" connection assignment g1xx400e

The INTERBUS input interface is electrically isolated between the fieldbus and the module.

**Output interface**: 9 pole D-Sub (female)

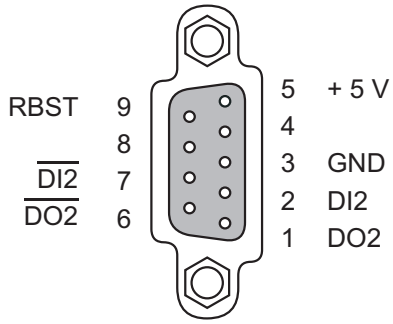


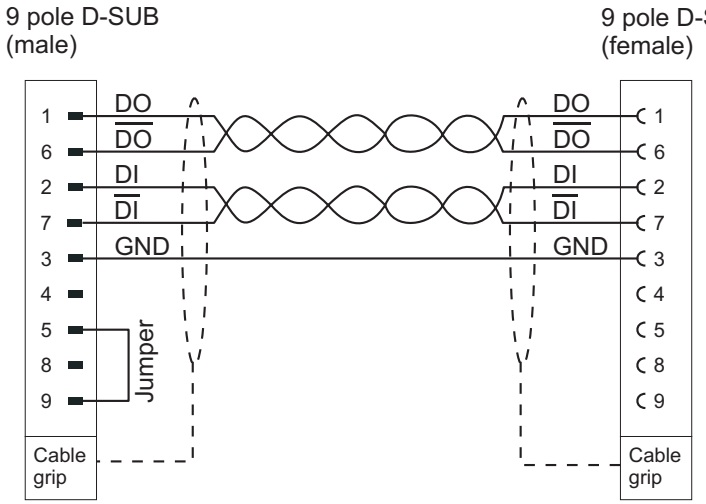

Fig. 4-14: "Socket" connection assignment g1xx403e

**Note**
A jumper in the connection plug (counter plug) of the INTERBUS output interface, between pins 5 (+5 V) and 9 (RBST) instructs the electronics to expect downstream INTERBUS modules. If this jumper is missing, no downstream fieldbus units are detected.
Standard cables produced according to the INTERBUS standard include this jumper in their connector.

The +5 V voltage (pin 5) must not be used for any other purpose.

## 4.2.7 Cabling of the Fieldbus Conductors

Commercial 9 pole D-SUB plugs or sockets having a maximum housing width of 16 mm can be used as plug connectors.




**Color coding**

| | |
|---|---|
| DO - DO | Yellow |
| $\overline{DO}$ - $\overline{DO}$ | Green |
| DI - DI | Grey |
| $\overline{DI}$ - $\overline{DI}$ | Pink |
| GND | Brown |

Fig. 4-15: Example of a remote bus cable

g1xx401e

**Further Information**

The INTERBUS CLUB provides further documentation on the World Wide Web. More information regarding cable specifications can be found at this side in the document “Technical Guideline - Data Cables for the INTERBUS Sensor/Actuator Bus"

http://www.interbusclub.com

# 5 Schematic Circuit Diagram

A basic representation of the input, output and supply circuitry are shown in Fig. 5-1.

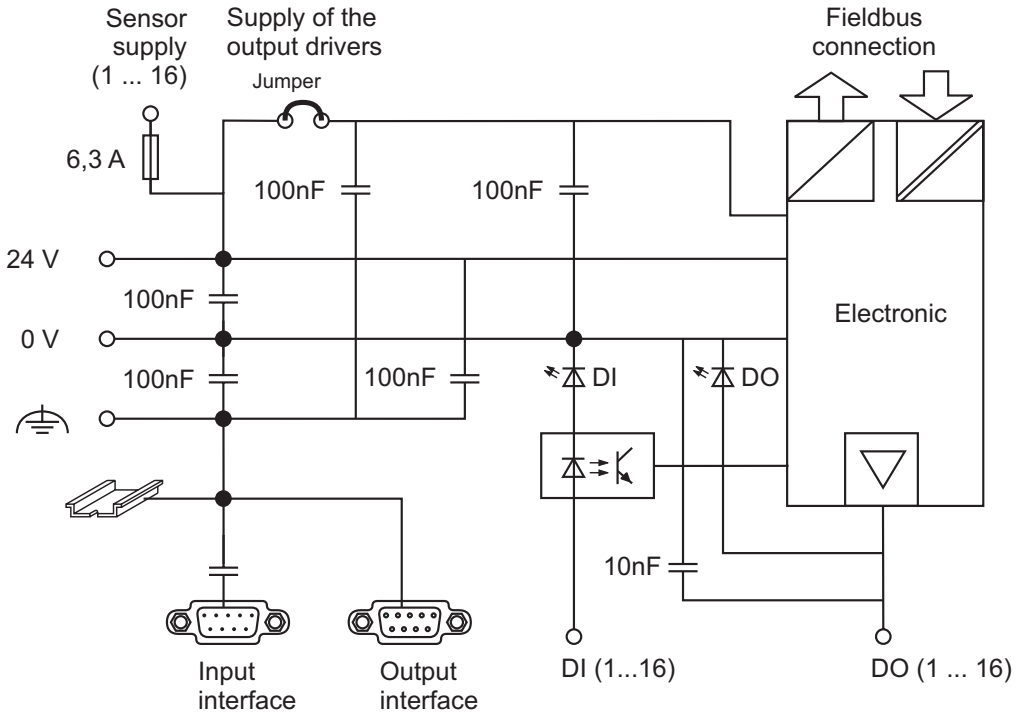



Fig. 5-1: Schematic Circuit Diagram g1x2409e

# 6 Status Indicators

The electronic module incorporates LED's for displaying the status of the fieldbus connection, the status of the inputs and outputs, and interference in the output circuit.

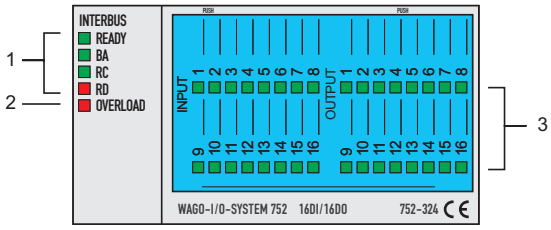



Fig. 6-1: Status Indicators g1x2405x

1 Fieldbus (INTERBUS) specific status indicators.

2 Interference in the output circuit is displayed as a collective fault marked "OVERLOAD".

3 Status LED's for the inputs and outputs are integrated under the marking label.

## 6.1 Input Status Indicators

The LED's are connected in series with the base module sensor connections, and will illuminate when a threshold input voltage is present.

| Input voltage | Input value | LED |
|---|---|---|
| -3 V ... +5 V | '0' | OFF |
| +5 V...+15 V | Not defined | Not defined |
| +15 V...+30 V | '1' | ON |

## 6.2 Output Status Indicators

The output status LED's display the actual state of each output. They will not be illuminated in the event of a short circuit at the output or a missing supply voltage to the output drivers.

| Output value of the higher ranking controls | Fault | LED |
|---|---|---|
| '1' | None | ON |
| '0' | None | OFF |
| '1' | Short circuit | OFF |
| '0' | Short circuit | OFF |
| '1' | No supply | OFF |
| '0' | No supply | OFF |

'1' = Output switched on
'0' = Output switched off

## 6.3 Fieldbus Interface Status Indicators

| LED | Color | Status | Meaning |
|---|---|---|---|
| READY *Operational* | Green | ON | The supply voltage is in the permissible tolerance range, the equipment is operative |
| | | OFF | Equipment not operative, insufficient supply voltage |
| BA *Bus active* | Green | ON | Bus is active, data exchange underway |
| | | BLINKING | The INTERBUS controller has an active configuration, data exchange not yet started |
| | | OFF | Bus is not active, no data exchange |
| RC *Remote Connected* | Green | ON | INTERBUS input interface is connected, bus reset of the master not active |
| | | OFF | Bus reset is active or interface incorrectly connected |
| RD *Remote Disconnected* | Red | ON | Continuing remote bus (INTERBUS output interface) is switched off |
| | | OFF | Continuing remote bus is not being used or switched on |

## 6.4 Overload Status Indicator

The LED designated “OVERLOAD”, when illuminated, indicates the presence of an output fault.

Possible output faults:

- Short circuit of one or more outputs
- Missing supply voltage to the output drivers
- Fault of an output driver
- Feedback

A fault is detected if a transmitted value of '1' by the master controller does not produce a threshold voltage at a corresponding output.

When an output fault is detected, the electronic module transmits a periphery fault signal to the fieldbus controller board. The I/O module switches the LED off again once the fault has been corrected, and after a 1 second delay, cancels the periphery fault message.

# 7 INTERBUS

## 7.1 Overview

INTERBUS is standardized in the EN 50 254 as a fieldbus. Its architecture is that of a data ring with a central bus master and bus slaves.

The INTERBUS differentiates among several sub-variants, two fieldbus variants of which should be mentioned for the decentralized periphery:

- Remote bus
- Installation remote bus

### 7.1.1 Features of the Remote Bus

- 1 master, max. 512 slaves
- Ring structure with active slave coupling
- max. bus segment length 400 m
- max. extension
  12.8 km (certified copper cable) RS 485 with a 9 pole D-Sub plug connector
  100 km (optical fibre cables)
- Transmission rate 500 kBaud
- With each new start, the master produces an updated list of the slaves connected

## 7.1.2 Description

Physically, the bus is structured as point-to-point connections between the slaves. Each slave possesses an “incoming” bus and an “outgoing” bus.

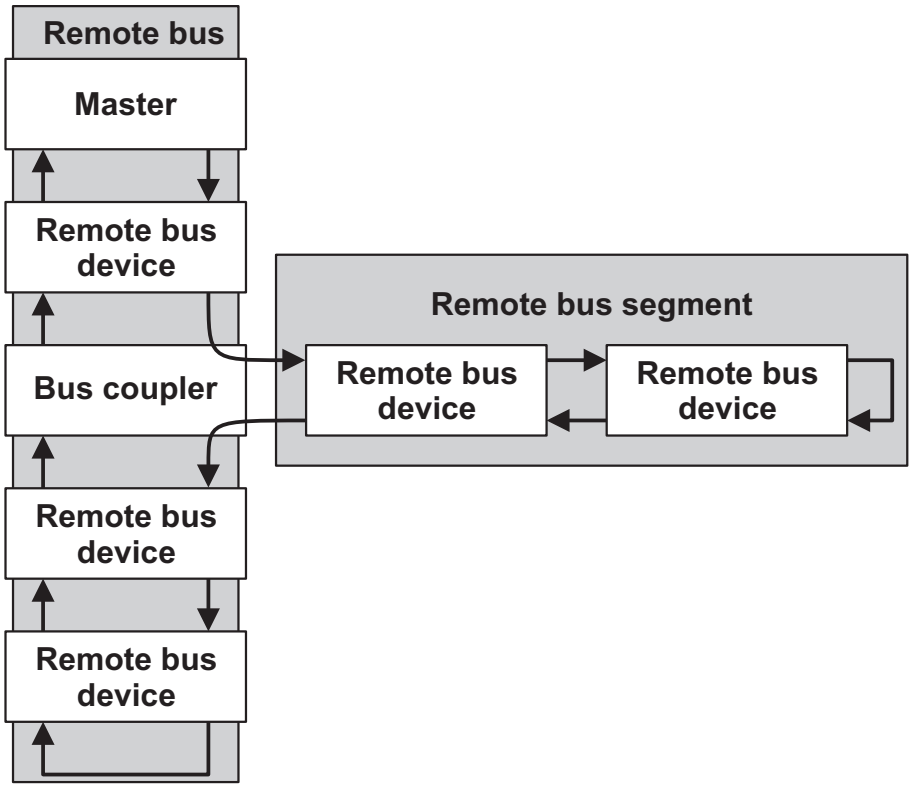



Fig. 7-1: INTERBUS, remote bus topology g112200e

Possible configuration:

- Fieldbus master :
  WAGO-I/O-SYSTEM 758, PC interface PCB INTERBUS-Master

  INTERBUS-Master of other manufacturers

- Fieldbus equipment:
  WAGO-I/O-SYSTEM 750, modular I/O system, digital and analog I/O
  WAGO-I/O-SYSTEM 752, digital I/O modules
  WAGO-I/O-SYSTEM 755, digital I/O modules (IP67)

The INTERBUS transmission log can be understood as a large shift register. Each slave, with its input and output data, bus position, and data width, is an integral part of this shift register. Input and output data are processed simultaneously during a scan cycle. The master receives input data from the end of the data ring as it enters output data into the shift register. Each slave receives data at its input, and outputs it to the next slave, thus acting as a bus repeater.

Each INTERBUS slave receives its address automatically, based on its physical position in the bus system. Control signals (CLOCK, RESET, SELECT, CONTROL) permit the monitoring of each individual slave.

Each slave has an ID register (identification register) containing information about the type of module, the number of I/O addresses, and status and fault conditions.

INTERBUS recognizes two operating modes:

1. ID cycle
   In the ID cycle, the fieldbus controller board reads the ID register of each device contained in the bus system and compiles the process image table on the basis of this information. The ID cycle is used for initialization and needs a request to become active.

2. Data cycle
   In the data cycle, the input data of each device is transmitted to the master, and the output data is transmitted from the master to each device.

## 7.2 Module Properties

The ID code of the I/O module and the data length as an INTERBUS slave is determined by the electronic module.

| Type | ID code | Data length |
|---|---|---|
| Remote bus unit | 0x03 | 32 Bit<br>The data length of the module is extended to 32 bit by the diagnostic information masked into the process data. |

# 7.3 Process Image and Diagnostic Status Bits

The process image is masked into the INTERBUS log word by word.

| Abbreviations | Meaning |
|---|---|
| DIx | Status of the digital input “x” |
| DOx | Status of the digital output “x” |
| DSx | Diagnostic status bit for the output group “x” |
| Word 0 (in) | 1. Word of the I/O module in the input process image |
| Word 1 (in) | 2. Word of the I/O module in the input process image |
| Word 0 (out) | 1. Word of the I/O module in the output process image |
| Word 1 (out) | 2. Word of the I/O module in the output process image |
| .x | Bit position in the word |

## 7.3.1 Process Image

| Word | | .15 | .14 | .13 | .12 | .11 | .10 | .9 | .8 | .7 | .6 | .5 | .4 | .3 | .2 | .1 | .0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 (In) | DIx | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| 1 (In) | DSx | | | | | | | | | | | | | 4 | 3 | 2 | 1 |
| 0 (Out) | DOx | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| 1 (Out) | | | | | | | | | | | | | | | | | |

## 7.3.2 Diagnostic Status Bits

Each diagnostic status bit is valid for a group of 4 outputs.

| Diagnostic Status Bit | Assigned output group |
|---|---|
| DS1 | DO1 ... DO4 |
| DS2 | DO5 ... DO8 |
| DS3 | DO9 ... DO12 |
| DS4 | DO13 ... DO16 |

The diagnostic status bit is set to '0' when the status of an output does not coincide with the status read back internally.

Valid reasons for the activation of a diagnostic message:

- Missing voltage supply to the output drivers
- Short circuit of an output conductor
- Overload at the output
- Internal fault of an output driver

A diagnostic status bit is set to '0' if a transmitted value of '1' by the master controller does not produce a threshold voltage at a corresponding output.

When such a fault is detected, the electronic module transmits a periphery fault signal to the fieldbus controller board, and illuminates the "OVERLOAD" LED. The I/O module switches the LED off again once the fault has been corrected, and after a 1 second delay, cancels the periphery fault message.

## 7.4 Fieldbus Controller Boards

Master control systems such as PLC's communicate to fieldbus devices on a network via fieldbus controller boWAGO offers the WAGO-I/O-SYSTEM 758 PC Interface PCB fieldbus controller board for INTERBUS.

Fieldbus controller boards for programmable logical controls are available from other manufacturers.

## 7.5 Configuration Software

Before a PLC can communicate I/O data with a fieldbus device, the fieldbus controller board has to be configured for each field bus device on the network.

To accomplish this, the WAGO-I/O-SYSTEM 758 fieldbus controller board is delivered with WAGO *NETCON* software for configuring and diagnosing fieldbus networks.

Further configuration software, e.g. CMD (Configuration Monitoring Diagnostic), is available from other manufacturers.

## 7.6 Example of a Configuration with WAGO *NETCON*

The following example shows how to configure an I/O module using WAGO *NETCON*:

### 1. Start WAGO NETCON


Fig. 7-2: WAGO *NETCON* icon p932x00x

### 2. Create a new project

Create a new project and select INTERBUS as the fieldbus system.
*Menu path: File - New*

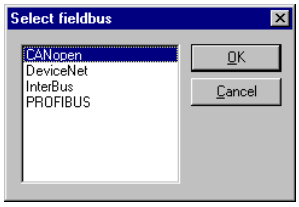



Fig. 7-3: Select fieldbus p932x01e

### 3. Select master

Select a fieldbus master on the surface.
*Menu path: Insert – Master*

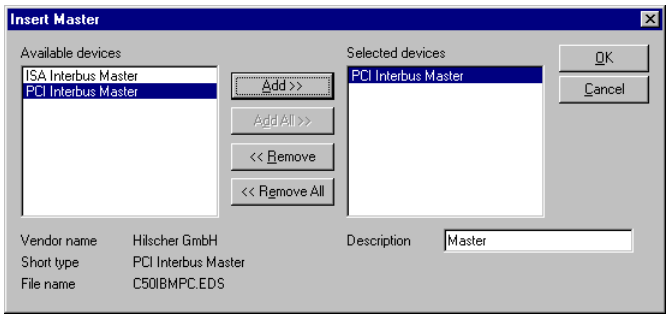



Fig. 7-4: Select controller board p932x02e

### 4. Add a slave remote bus device

Add a remote bus device as a slave
*Menu path: Insert – remote bus equipment*

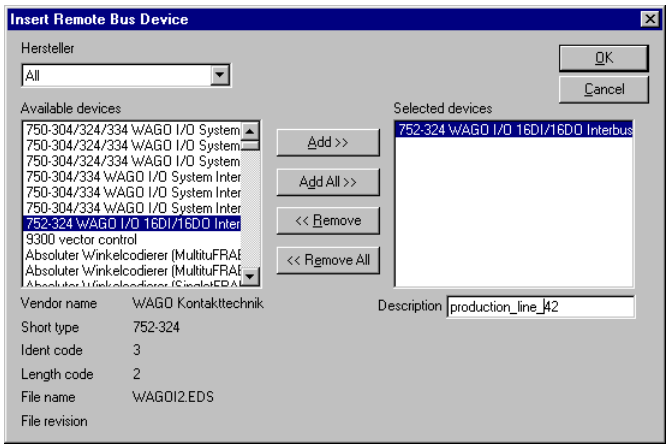



Fig. 7-5: Insert remote bus device p932x07e

The devices on the INTERBUS network can be detected automatically by performing an “Automatic Network Scan”. Use the manual configuration editor to customize device icons and descriptors.

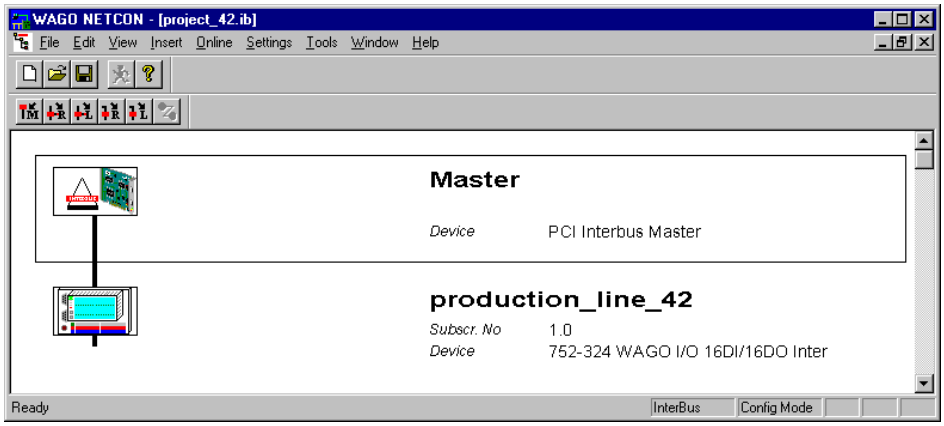



Fig. 7-6: Configuration p932x03e

### 5. Download the configuration

Download the project configuration to the interface PCB (Download)
*Menu path: Online – Download*

Following a warning message and the prompt “Do you really want to download?”, and the selection of a driver, the data is downloaded.

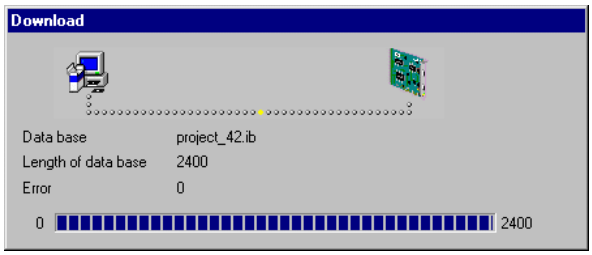



Fig. 7-7: Download p932x04e

### 6. System Diagnostic Tools within WAGO *NETCON*

All input and output signals can be easily monitored and/or set using the integrated “I/O monitor”.
*Menu path: Online – I/O Monitor...*

With the debug mode activated, WAGO *NETCON* logs fault messages received from devices connected to the INTERBUS network.
*Menu path: Online – Start Debug Mode...*

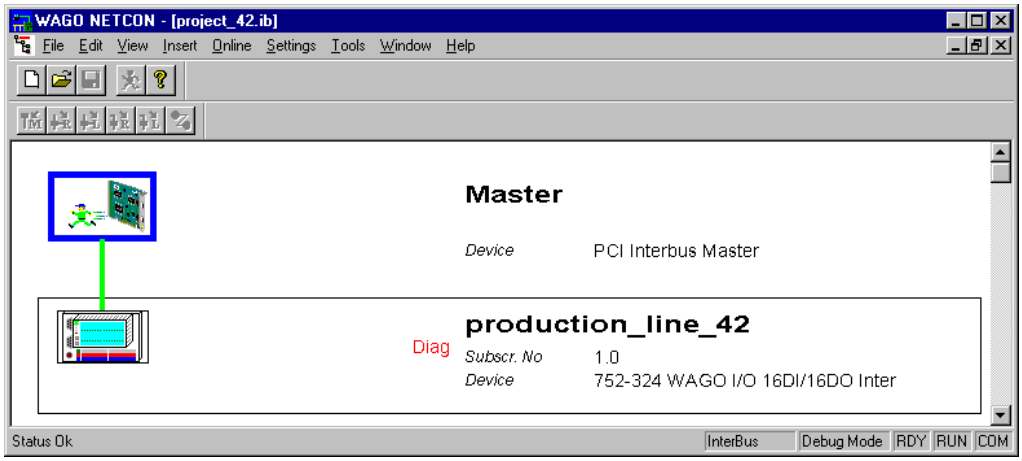



Fig. 7-8: Diagnostics, Overview p932x05e

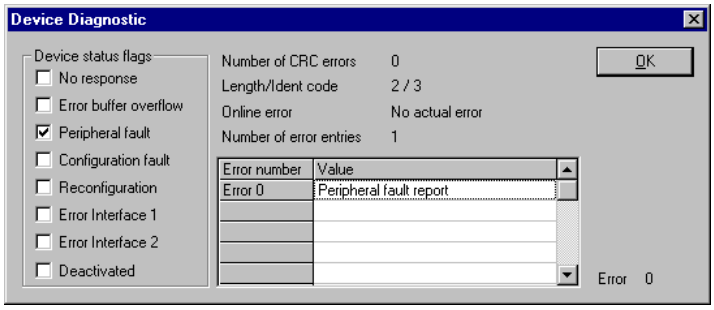



Fig. 7-9: Diagnostics, Device Diagnostics p932x06e

# 7.7 Configuration Example With CMD

The following example shows how to configure an I/O module using CMD. Reference the CMD manual for further description of this software.

### 1. Start CMD


Fig. 7-10: CMD icon p932x08x

### 2. Create a new project

Create a new project for your application.
*Menu path: File - New*

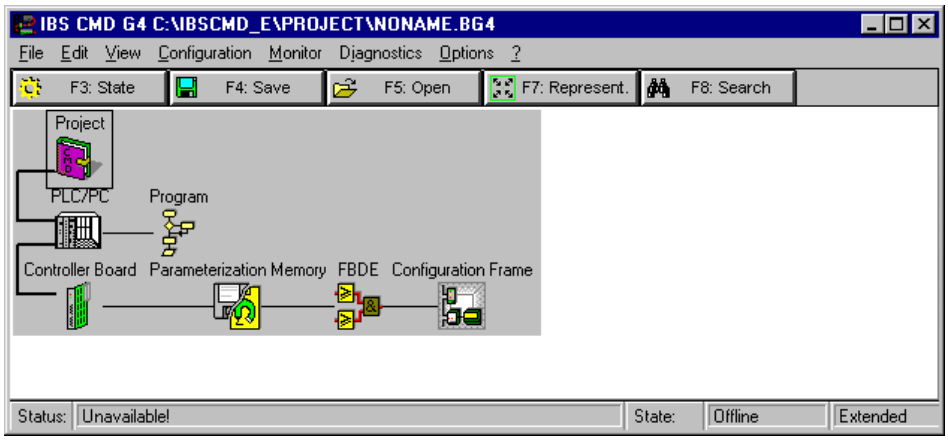



Fig. 7-11: CMD main window p932x09e

### 3. Select fieldbus controller board

Right-click on the controller board icon, select the menu item "*Type*...", and select the current controller board type.

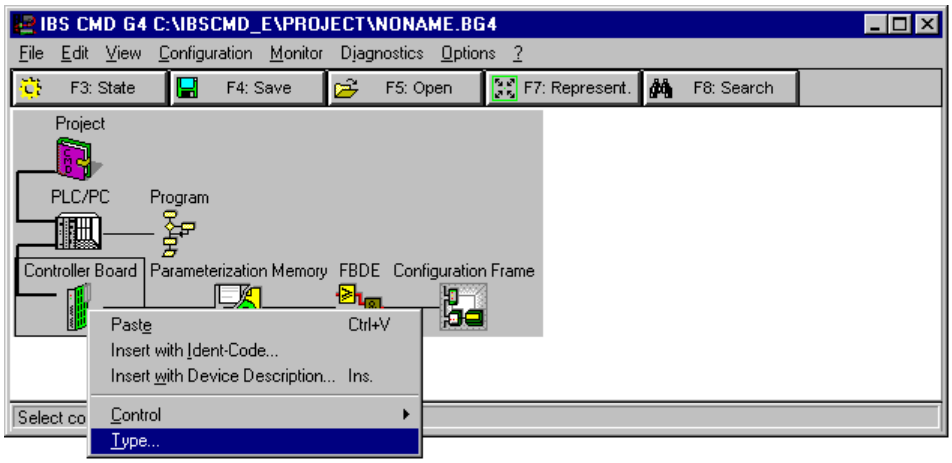



Fig. 7-12: Select controller board p932x10e

### 4. Add a slave remote bus device

The network structure can be automatically detected by right-clicking on the configuration frame icon, and selecting the menu item "*Read Again*". Perform a manual configuration if you wish to document the project with device specific icons and/or descriptors.

Right-click on the controller board icon and select the menu item "*Insert with ident code…*" to manually insert a device into the network configuration.

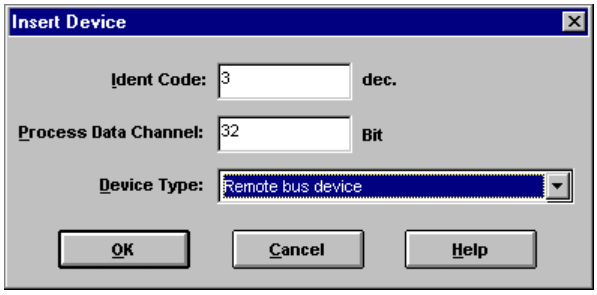



Fig. 7-13: Insert remote bus device p932x16e

Once inserted, further information relating to the device can be entered in the "*Insert Device Description*" dialog. An icon can be selected for the device by clicking the command button "*Icon…*"..

**Further information**
Ask WAGO for the icons of the WAGO devices. They are available on floppy disc or via the WAGO INTERNET webside.

http://www.wago.com

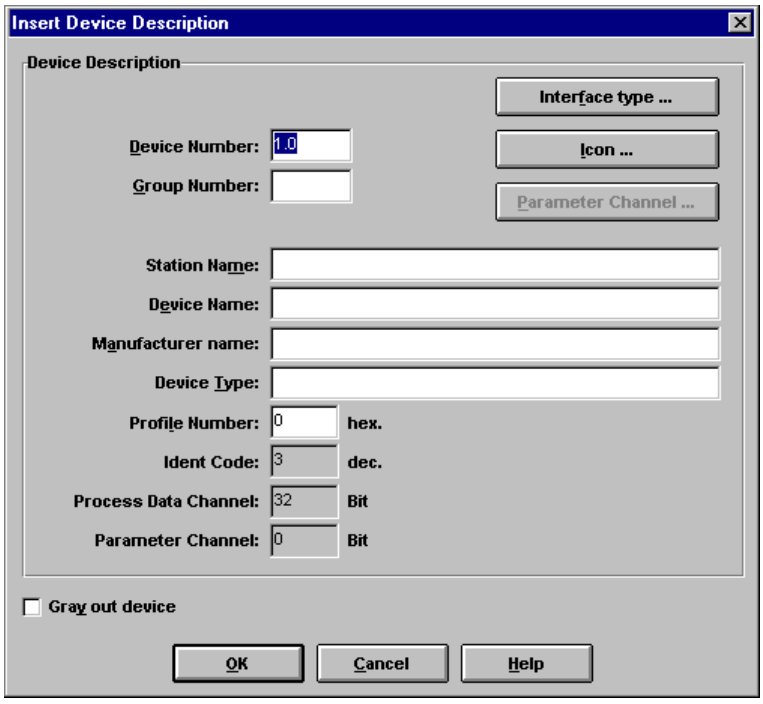



Fig. 7-14: Device description p932x13e

# 8 Accessories

| Accessories | Article No. | Pcs. per packing unit |
|---|---|---|
| Symbols for CMD configuration software (floppy disk) | 750-913 | 1 |
| Marking label 16 DI/16DO | 752-102 | 1 sheet (9 labels) |
| Replacement fuse F1 (TR 5 / 250 V / 6.3A T)<br>Micro-fuse according to IEC 127-3<br>**Note:** Use UL-Recognized fuse only | 752-180 | 5 |
| Felt tipped pen for non-smudge writing | 210-110 | 1 |
| Operating tool (screw driver)<br>- Blade (2.5x0.4) mm<br>- Blade (3.5x0.4) mm<br>- with part.insulated shank, blade (2.5x0.4) mm<br>- with part.insulated shank, blade (3.5x0.4) mm | <br>210-119<br>210-120<br>210-619<br>210-620 | <br>1<br>1<br>1<br>1 |

# 9 Glossary

**Actuator** Device driven by the I/O module.

**Base Module** Wiring level to connect the supply, the fieldbus conductors and the sensors and actuators.

**Electronic Module** Plug-in component from the WAGO-I/O-SYSTEM 752

**Fieldbus controller board**
[Master]
Bus master which, as a higher ranking unit, controls the data transmission on the bus. It interrogates the input and status values of the slave devices and transmits output and control data to them.
Processing unit for the interrogation of and access to the decentral fieldbus equipment. It is the fieldbus master which co-ordinates the bus traffic and transfers the data to a control system.

**Group** [Input / output group, connection group]
General grouping of I/O channels. With their 8 channels, outputs form a supply group.

**Input Interface** INTERBUS connection from an upstream bus slave. Electrically isolated interface.

**I/O addresses** [I/O register]
Input / output area(s) for the I/O data

**I/O data** Input / Output data

**I/O module** Any fieldbus device from the WAGO-I/O-SYSTEM 752 series consisting of a base module and an electronic module for the recording and output of digital signals.

**I/O point** Input / output point, signal input or output

**Master** Fieldbus controller board

**Output Interface** INTERBUS connection to a downstream bus slave.

**Sensor** [Generator, initiator]
Device interrogated by the I/O module.

**Slave** Bus slave addressed by a fieldbus master.

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