Manual

AUTOMATION

WAGO-I/O-SYSTEM 750

PROFIBUS DP/V1

750-333(/xxx-xxx)

Fieldbus coupler

Version 1.2.0

WAGO®

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Every conceivable measure has been taken to ensure the accuracy and completeness of this documentation. However, as errors can never be fully excluded, we always appreciate any information or suggestions for improving the documentation.

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We wish to point out that the software and hardware terms as well as the trademarks of companies used and/or mentioned in the present manual are generally protected by trademark or patent.

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1 Notes about this Documentation

Note

Always retain this documentation!
This documentation is part of the product. Therefore, retain the documentation during the entire service life of the product. Pass on the documentation to any subsequent user. In addition, ensure that any supplement to this documentation is included, if necessary.

1.1 Validity of this Documentation

This documentation is only applicable to the “PROFIBUS DP/V1” (750-333) and the variants listed in the table below.

Table 1: Variants

Item Number/Variant	Designation
750-333	PROFIBUS DP/V1
750-333/025-000	PROFIBUS DP/V1/T

Note

Documentation Validity for Variants
Unless otherwise indicated, the information given in this documentation applies to listed variants.

The product “PROFIBUS DP/V1” (750-333) shall only be installed and operated according to the instructions in this manual and the system description for the WAGO-I/O-SYSTEM 750.

NOTICE

Consider power layout of the WAGO-I/O-SYSTEM 750!
In addition to these operating instructions, you will also need the system description for the WAGO-I/O-SYSTEM 750, which can be downloaded at www.wago.com. There, you can obtain important information including information on electrical isolation, system power and supply specifications.

1.2 Copyright

1.3 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).

1.4 Number Notation

Table 2: Number Notation

Number code	Example	Note
Decimal	100	Normal notation
Hexadecimal	0x64	C notation
Binary	'100' '0110.0100'	In quotation marks, nibble separated with dots (.)

1.5 Font Conventions

Table 3: Font Conventions

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

2 Important Notes

This section includes an overall summary of the most important safety requirements and notes that are mentioned in each individual section. To protect your health and prevent damage to devices as well, it is imperative to read and carefully follow the safety guidelines.

2.1 Legal Bases

2.1.1 Subject to Changes

WAGO Kontakttechnik GmbH & Co. KG reserves the right to provide for any alterations or modifications that serve to increase the efficiency of technical progress. WAGO Kontakttechnik GmbH & Co. KG owns all rights arising from the granting of patents or from the legal protection of utility patents. Third-party products are always mentioned without any reference to patent rights. Thus, the existence of such rights cannot be excluded.

2.1.2 Personnel Qualifications

All sequences implemented on WAGO-I/O-SYSTEM 750 devices may only be carried out by electrical specialists with sufficient knowledge in automation. The specialists must be familiar with the current norms and guidelines for the devices and automated environments.

All changes to the coupler or controller should always be carried out by qualified personnel with sufficient skills in PLC programming.

2.1.3 Use of the WAGO-I/O-SYSTEM 750 in Compliance with Underlying Provisions

Fieldbus couplers, fieldbus controllers and I/O modules found in the modular WAGO-I/O-SYSTEM 750 receive digital and analog signals from sensors and transmit them to actuators or higher-level control systems. Using programmable controllers, the signals can also be (pre-) processed.

The devices have been developed for use in an environment that meets the IP20 protection class criteria. Protection against finger injury and solid impurities up to 12.5 mm diameter is assured; protection against water damage is not ensured. Unless otherwise specified, operation of the devices in wet and dusty environments is prohibited.

Operating the WAGO-I/O-SYSTEM 750 devices in home applications without further measures is only permitted if they meet the emission limits (emissions of interference) according to EN 61000-6-3. You will find the relevant information in the section “Device Description” > “Standards and Guidelines” in the manual for the used fieldbus coupler/controller.

Appropriate housing (per 94/9/EG) is required when operating the WAGO-I/O-SYSTEM 750 in hazardous environments. Please note that a prototype test certificate must be obtained that confirms the correct installation of the system in a housing or switch cabinet.

2.1.4 Technical Condition of Specified Devices

The devices to be supplied ex works are equipped with hardware and software configurations, which meet the individual application requirements. WAGO Kontakttechnik GmbH & Co. KG will be exempted from any liability in case of changes in hardware or software as well as to non-compliant usage of devices.

Please send your request for modified and new hardware or software configurations directly to WAGO Kontakttechnik GmbH & Co. KG.

2.2 Safety Advice (Precautions)

For installing and operating purposes of the relevant device to your system the following safety precautions shall be observed:

DANGER

Do not work on devices while energized!
All power sources to the device shall be switched off prior to performing any installation, repair or maintenance work.

DANGER

Install the device only in appropriate housings, cabinets or in electrical operation rooms!
The WAGO-I/O-SYSTEM 750 and its components are an open system. As such, install the system and its components exclusively in appropriate housings, cabinets or in electrical operation rooms. Allow access to such equipment and fixtures to authorized, qualified staff only by means of specific keys or tools.

NOTICE

Replace defective or damaged devices!
Replace defective or damaged device/module (e.g., in the event of deformed contacts), since the long-term functionality of device/module involved can no longer be ensured.

NOTICE

Protect the components against materials having seeping and insulating properties!
The components are not resistant to materials having seeping and insulating properties such as: aerosols, silicones and triglycerides (found in some hand creams). If you cannot exclude that such materials will appear in the component environment, then install the components in an enclosure being resistant to the above-mentioned materials. Clean tools and materials are imperative for handling devices/modules.

NOTICE

Clean only with permitted materials!
Clean soiled contacts using oil-free compressed air or with ethyl alcohol and leather cloths.

NOTICE

Do not use any contact spray!
Do not use any contact spray. The spray may impair contact area functionality in connection with contamination.

NOTICE

Do not reverse the polarity of connection lines!
Avoid reverse polarity of data and power supply lines, as this may damage the devices involved.

NOTICE

Avoid electrostatic discharge!
The devices are equipped with electronic components that may be destroyed by electrostatic discharge when touched. Please observe the safety precautions against electrostatic discharge per DIN EN 61340-5-1/-3. When handling the devices, please ensure that environmental factors (personnel, work space and packaging) are properly grounded.

3 System Description

The WAGO-I/O-SYSTEM 750 is a modular, fieldbus-independent input/output system (I/O system). The configuration described here consists of a fieldbus coupler/controller (1) and the modular I/O modules (2) for any signal shapes that form the fieldbus node together. The end module (3) completes the node and is required for correct operation of the fieldbus node.

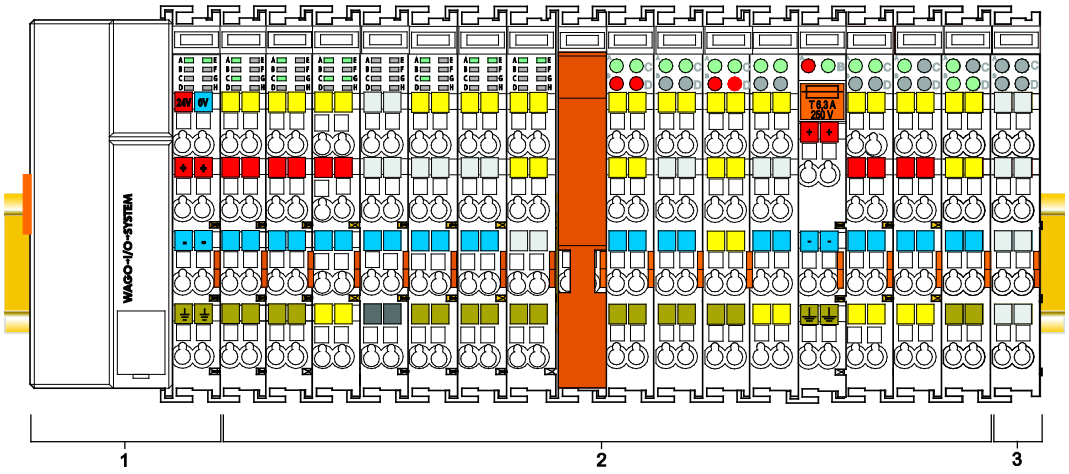

Figure 1: Fieldbus Node (Example)

Fieldbus couplers/controllers are available for different fieldbus systems.

The standard fieldbus couplers/controllers and extended ECO fieldbus couplers contain the fieldbus interface, electronics and a power supply terminal. The fieldbus interface forms the physical interface to the relevant fieldbus. The electronics process the data of the I/O modules and make it available for the fieldbus communication. The 24 V system supply and the 24 V field supply are fed in via the integrated power supply terminal.

The fieldbus coupler/controller exchanges process data with the respective control via the respective fieldbus. The programmable fieldbus controllers (PFC) allow implementation of additional PLC functions. WAGO-I/O-PRO is used to program the fieldbus controllers according to IEC 61131-3.

I/O modules for diverse digital and analog I/O signals as well as special functions can be connected to the fieldbus coupler/controller. The communication between the fieldbus coupler/controller and the I/O modules is carried out via an internal bus.

The components of the WAGO-I/O-SYSTEM 750 have clear termination points, light emitting diodes for status display, plug-in mini WSB tags and group marker cards for labeling.

The 1, 2 or 3 wire technology supplemented by a ground wire connection allows for direct sensor or actuator wiring.

3.1 Manufacturing Number

The serial number indicates the delivery status directly after production. This number is part of the labeling on the side of each component.
In addition, the serial number is printed on the cover cap of the configuration and programming interface of the fieldbus coupler/controller, so that it can also be read when installed.

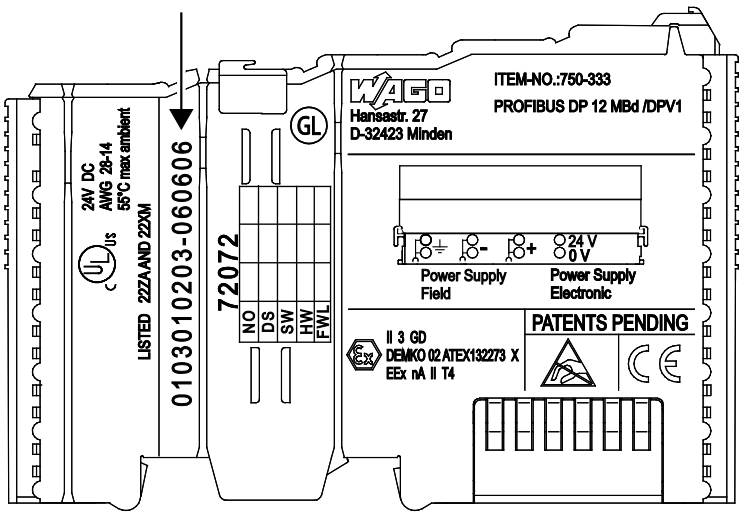

Figure 2: Labeling on the Side of a Component (Example)

Manufacturing number

01	03	01	02	03	-B060606
Calendar week	Year	Software version	Hardware version	Firmware loader version	Internal number

Figure 3: Example of a Manufacturing Number

The manufacturing number consists of the production week and year, the software version (if available), the hardware version of the component, the firmware loader (if available) and further internal information for WAGO Kontakttechnik GmbH & Co. KG.

3.2 Component Update

For the case of an update of one component, the lateral marking on each component contains a prepared matrix.

This matrix makes columns available for altogether three updates to the entry of the current update data, like production order number (NO; starting from calendar week 13/2004), date stamp (DS), software version (SW), hardware version (HW) and the firmware loader version (FWL, if available).

Current version data for		1. Update	2. Update	3. Update	
Production order no.	**NO**				← only starting from calendar week 13/2004
Date stamp	**DS**				
Software version	**SW**				
Hardware version	**HW**				
Firmware loader vers.	**FWL**				← only for fieldbus couplers/controllers

If the update of a component took place, the current version data are registered into the columns of the matrix.

Additionally with the update of a fieldbus coupler or controller also the cover of the configuration and programming interface of the fieldbus coupler or controller is imprinted with the current production order number.

The original manufacturing information on the device's housing remains unchanged.

3.3 Storage, Assembly and Transport

Whenever possible, the components are to be stored in their original packaging. Likewise, the original packaging provides optimal protection during transport.

When assembling or repacking the components, the contacts must not be soiled or damaged. The components must be stored and transported in appropriate containers/packaging. Thereby, the ESD information is to be regarded.

3.4 Assembly Guidelines/Standards

DIN 60204	Electrical equipping of machines
DIN EN 50178	Equipping of high-voltage systems with electronic components (replacement for VDE 0160)
EN 60439	Low voltage switchgear assemblies

3.5 Power Supply

3.5.1 Isolation

Within the fieldbus node, there are three electrically isolated potentials:

- Electrically isolated fieldbus interface via transformer
- Electronics of the fieldbus couplers/controllers and the I/O modules (internal bus)
- All I/O modules have an electrical isolation between the electronics (internal bus, logic) and the field electronics. Some digital and analog input modules have each channel electrically isolated, please see catalog.

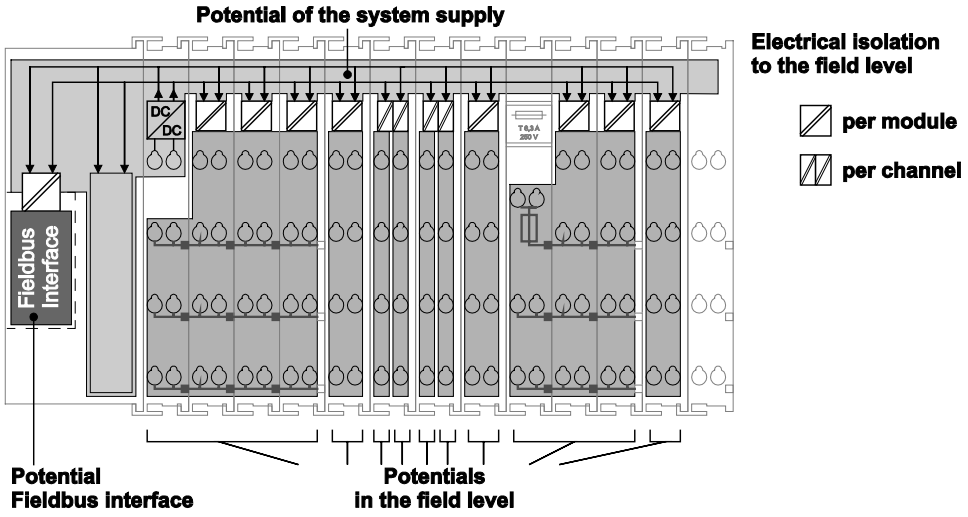

Figure 4: Isolation for Fieldbus Couplers/Controllers (Example)

3.5.2 System Supply

3.5.2.1 Connection

The WAGO-I/O-SYSTEM 750 requires a 24 V direct current system supply. The power supply is provided via the fieldbus coupler/controller and, if necessary, in addition via internal system supply modules 750-613. The power supply is reverse voltage protected.

NOTICE

Do not use an incorrect voltage/frequency!
The use of an incorrect supply voltage or frequency can cause severe damage to the components.

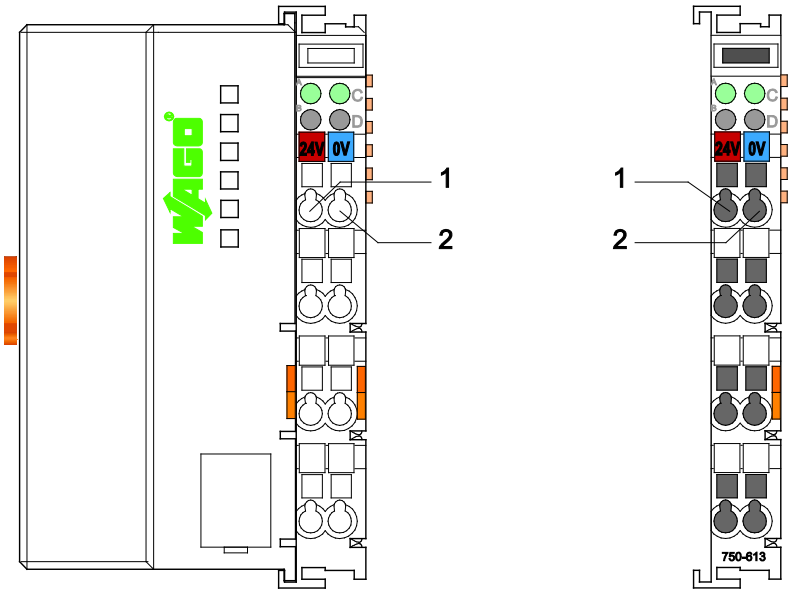

Figure 5: System Supply via Fieldbus Coupler/Controller (left) and via Internal System Supply Module (right)

Table 4: Legend for Figure “System Supply via Fieldbus Coupler/Controller (left) and via Internal System Supply Module (right)”

Position	Description
1	System supply DC 24 V (-25 % … +30 %)
2	System supply 0 V

The fed DC 24 V supplies all internal system components, e.g. fieldbus coupler/controller electronics, fieldbus interface and I/O modules via the internal bus (5 V system voltage). The 5 V system voltage is galvanically connected to the 24 V system supply.

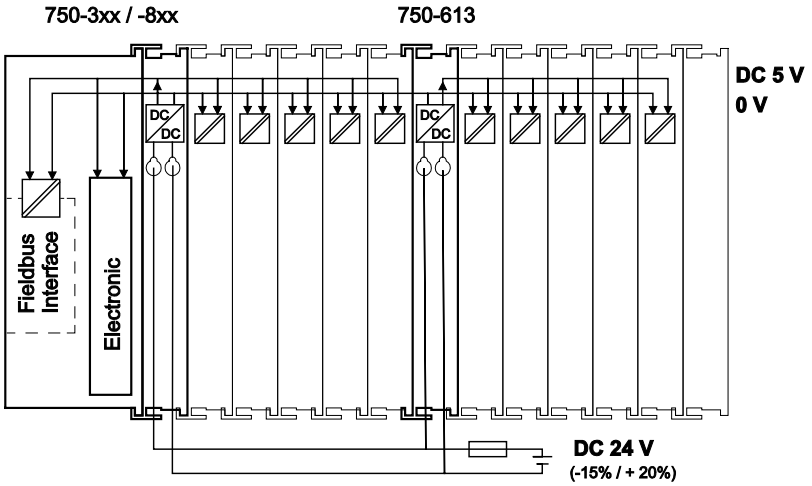

Figure 6: System Voltage for Standard Couplers/Controllers and Extended ECO Couplers

Note

Only reset the system simultaneously for all supply modules!
Reset the system by simultaneously switching the system supply at all supply modules (fieldbus coupler/controller and potential supply module with bus power supply) off and on again.

3.5.2.2 Dimensioning

Note

Recommendation
A stable power supply cannot always be assumed. Therefore, you should use regulated power supplies to ensure the quality of the supply voltage.

The supply capacity of the fieldbus coupler/controller or the internal system supply module can be taken from the technical data of the components.

Table 5: Alignment

Internal current consumption[*)]	Current consumption via system voltage (5 V for electronics of I/O modules and fieldbus coupler/controller).
Total current for I/O modules[*)]	Available current for the I/O modules. Provided by the bus power supply unit. See fieldbus coupler/controller and internal system supply module

[*)] See current catalog, manuals, Internet

Example:

Calculating the current consumption on the fieldbus coupler:

Internal current consumption of the coupler	350 mA at 5 V
Total current for I/O modules	1650 mA at 5 V
Sum $I_{(5\ V)\ total}$	**2000 mA at 5 V**

The internal current consumption is indicated in the technical data for each bus terminal. In order to determine the total requirement, add together the values of all I/O modules in the node.

Note

Please note the aggregate current for I/O modules. It may be necessary to supply potential!
When the sum of the internal current consumption for the I/O modules exceeds their aggregate current, you must use a supply module with bus power supply. Install it before the position where the permissible aggregate current would be exceeded.

Example:

Calculating the total current on a standard fieldbus coupler/controller:

A node configuration with 20 relay modules (750-517) and 30 digital input modules (750-405) should be attached to a fieldbus coupler/controller:

Internal current consumptions	20 × 90 mA = 1800 mA at 5 V
	+ 30 × 2 mA = 60 mA at 5 V
Sum of internal current consumptions	**1860 mA at 5 V**

However, the fieldbus coupler can only provide 1650 mA for the I/O modules. Consequently, an internal system supply module (750-613), e. g. in the middle of the node, should be added.

Note

Recommendation
Utilize the **smartDESIGNER** feature WAGO ProServe® software to configure fieldbus node assembly. You can test the configuration via the integrated plausibility check.

The maximum input current of the 24 V system supply is 500 mA. The exact electrical consumption ($I_{(V)}$) can be determined with the following formulas:

Fieldbus coupler or controller

$I_{(5\ V)\ total}$ = Sum of all the internal current consumption of the connected I/O modules + internal current consumption of the fieldbus coupler/controller

Internal system supply module

$I_{(5\ V)\ total}$ = Sum of all the internal current consumption of the connected I/O modules at internal system supply module

$$\text{Input current } I_{(24\ V)} = \frac{5\ V}{24\ V} \times \frac{I_{(5\ V)\ total}}{\eta}$$

$\eta = 0.87$
(87 % Efficiency of the power supply at nominal load 24 V)

Note

Activate all outputs when testing the current consumption!
If the electrical consumption of a power supply point for the 24 V system supply exceeds 500 mA, then the cause may be an improperly dimensioned node or a defect.
During the test, you must activate all outputs.

3.5.3 Field Supply

3.5.3.1 Connection

Sensors and actuators can be directly connected to the relevant channel of the I/O module in 1, 2, 3 or 4 conductor connection technology. The I/O module supplies power to the sensors and actuators. The input and output drivers of some I/O modules require the field side supply voltage.

The fieldbus coupler/controller provides field side power (DC 24 V). In this case it is a passive power supply without protection equipment.

Power supply modules with or without fuse holder and diagnostic capability are available for the power supply of other field potentials (DC 24 V, AC/DC 0 … 230 V, AC 120 V, AC 230 V). The power supply modules can also be used to set up various potential groups. The connections are connected in pairs to a power contact.

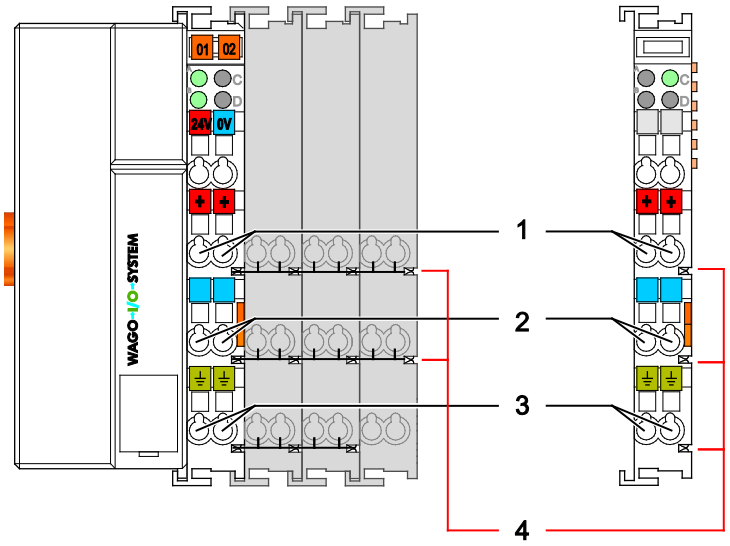

Figure 7: Field Supply for Standard Couplers/Controllers and Extended ECO Couplers

Table 6: Legend for Figure “Field Supply for Standard Couplers/Controllers and Extended ECO Couplers”

Field supply	
1	24 V (-15 % / +20 %)
2	0 V
3	Optional ground potential
Power jumper contacts	
4	Potential distribution to adjacent I/O modules

The field-side power supply is automatically derived from the power jumper contacts when snapping an I/O module.

The current load of the power contacts must not exceed 10 A on a continual basis.

By inserting an additional power supply module, the field supply via the power contacts is disrupted. From there a new power supply occurs which may also contain a new voltage potential.

Note

Re-establish the ground connection when the connection to the power jumper contacts is disrupted!
Some I/O modules have no or very few power contacts (depending on the I/O function). Due to this, the passing through of the relevant potential is disrupted. If you require a field supply via power jumper contacts for subsequent I/O modules, then you have to use a power supply module.
Note the data sheets of the I/O modules.

Note

Use a spacer module when setting up a node with different potentials!
In the case of a node setup with different potentials, e.g. the alteration from DC 24 V to AC 230 V, you should use a spacer module. The optical separation of the potentials acts as a warning to heed caution in the case of wiring and maintenance works. Thus, you can prevent the results of wiring errors.

3.5.3.2 Fusing

Internal fusing of the field supply is possible for various field voltages via an appropriate power supply module.

Table 7: Power Supply Modules

Order No.	Field Voltage
750-601	24 V DC, Supply/Fuse
750-609	230 V AC, Supply/Fuse
750-615	120 V AC, Supply/Fuse
750-617	24 V AC, Supply/Fuse
750-610	24 V DC, Supply/Fuse/Diagnosis
750-611	230 V AC, Supply/Fuse/Diagnosis
750-606	Supply Module 24 V DC, 1,0 A, Ex i
750-625/000-001	Supply Module 24 V DC, 1,0 A, Ex i (without diagnostics)

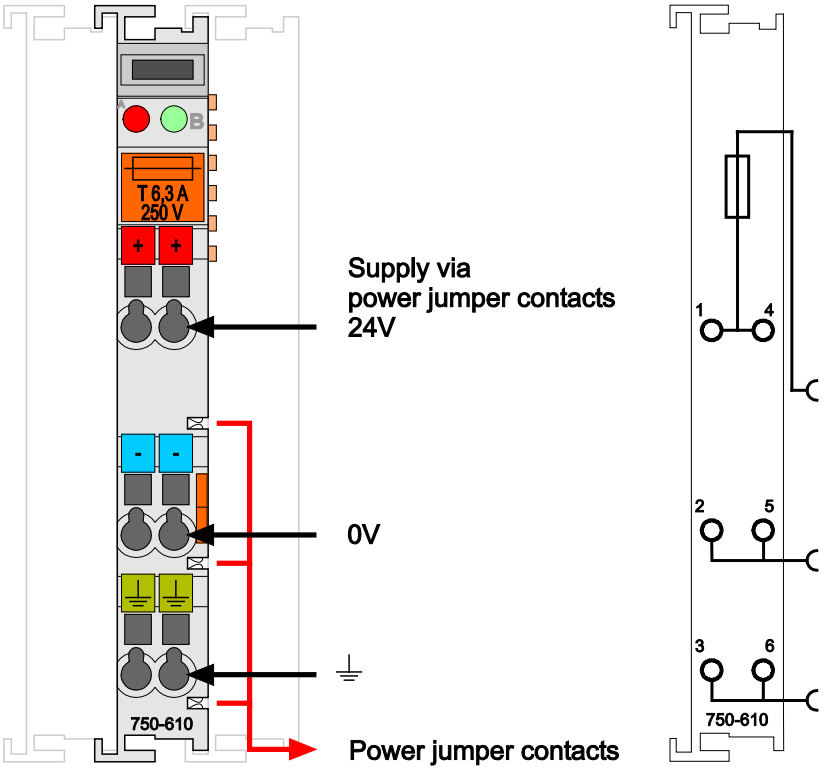

Figure 8: Supply Module with Fuse Carrier (Example 750-610)

NOTICE

Observe the maximum power dissipation and, if required, UL requirements!
In the case of power supply modules with fuse holders, you must only use fuses with a maximum dissipation of 1.6 W (IEC 127).
For UL approved systems only use UL approved fuses.

In order to insert or change a fuse, or to switch off the voltage in succeeding I/O modules, the fuse holder may be pulled out. In order to do this, use a screwdriver

for example, to reach into one of the slits (one on both sides) and pull out the holder.

Figure 9: Removing the Fuse Carrier

Lifting the cover to the side opens the fuse carrier.

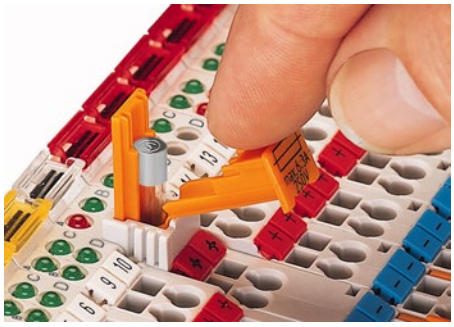

Figure 10: Opening the Fuse Carrier

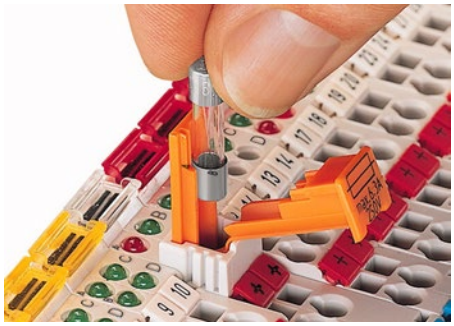

Figure 11: Changing the Fuse

After changing the fuse, the fuse carrier is pushed back into its original position.

Alternatively, fusing can be done externally. The fuse modules of the WAGO series 281 and 282 are suitable for this purpose.

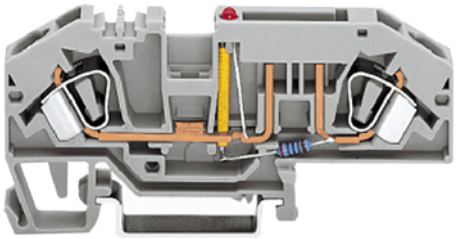

Figure 12: Fuse Modules for Automotive Fuses, Series 282

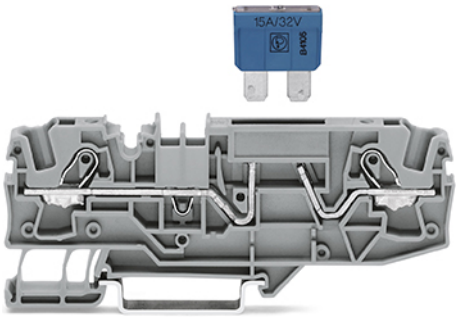

Figure 13: Fuse Modules for Automotive Fuses, Series 2006

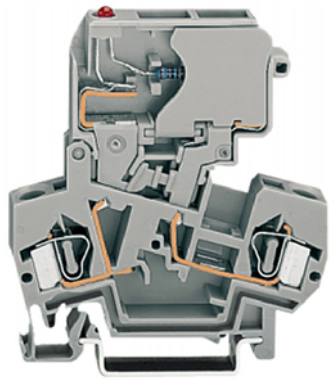

Figure 14: Fuse Modules with Pivotable Fuse Carrier, Series 281

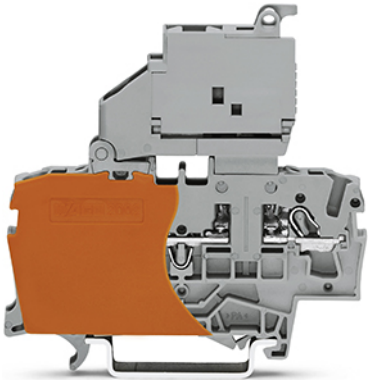

Figure 15: Fuse Modules with Pivotable Fuse Carrier, Series 2002

3.5.4 Supplementary Power Supply Regulations

The WAGO-I/O-SYSTEM 750 can also be used in shipbuilding or offshore and onshore areas of work (e. g. working platforms, loading plants). This is demonstrated by complying with the standards of influential classification companies such as Germanischer Lloyd and Lloyds Register.

Filter modules for 24 V supply are required for the certified operation of the system.

Table 8: Filter Modules for 24 V Supply

Order No.	Name	Description
750-626	Supply Filter	Filter module for system supply and field supply (24 V, 0 V), i. e. for fieldbus coupler/controller and bus power supply (750-613)
750-624	Supply Filter	Filter module for the 24 V field supply (750-602, 750-601, 750-610)

Therefore, the following power supply concept must be absolutely complied with.

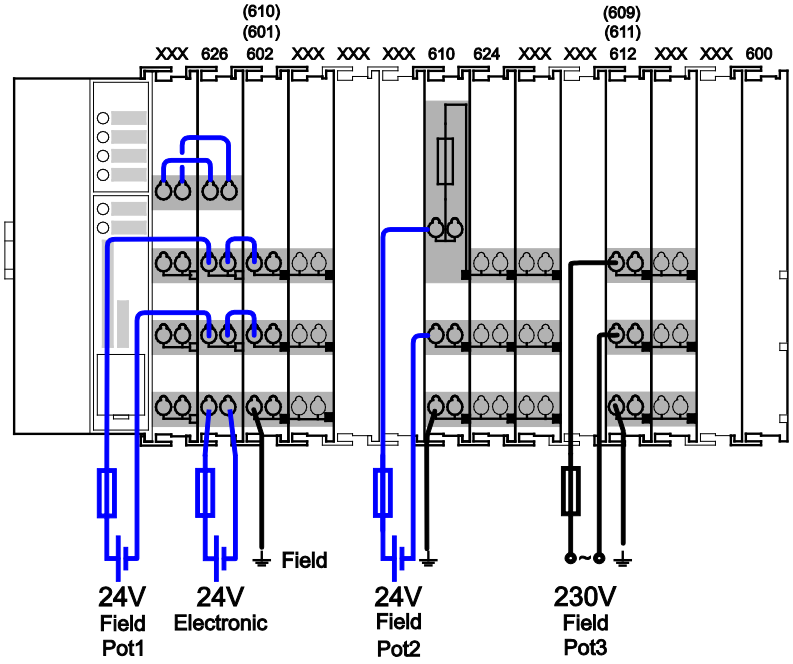

Figure 16: Power Supply Concept

Note

Use a supply module for equipotential bonding!
Use an additional 750-601/ 602/ 610 Supply Module behind the 750-626 Filter Module if you want to use the lower power jumper contact for equipotential bonding, e.g., between shielded connections and require an additional tap for this potential.

3.5.5 Supply Example

Note

The system supply and the field supply shall be separated!
You should separate the system supply and the field supply in order to ensure bus operation in the event of a short-circuit on the actuator side.

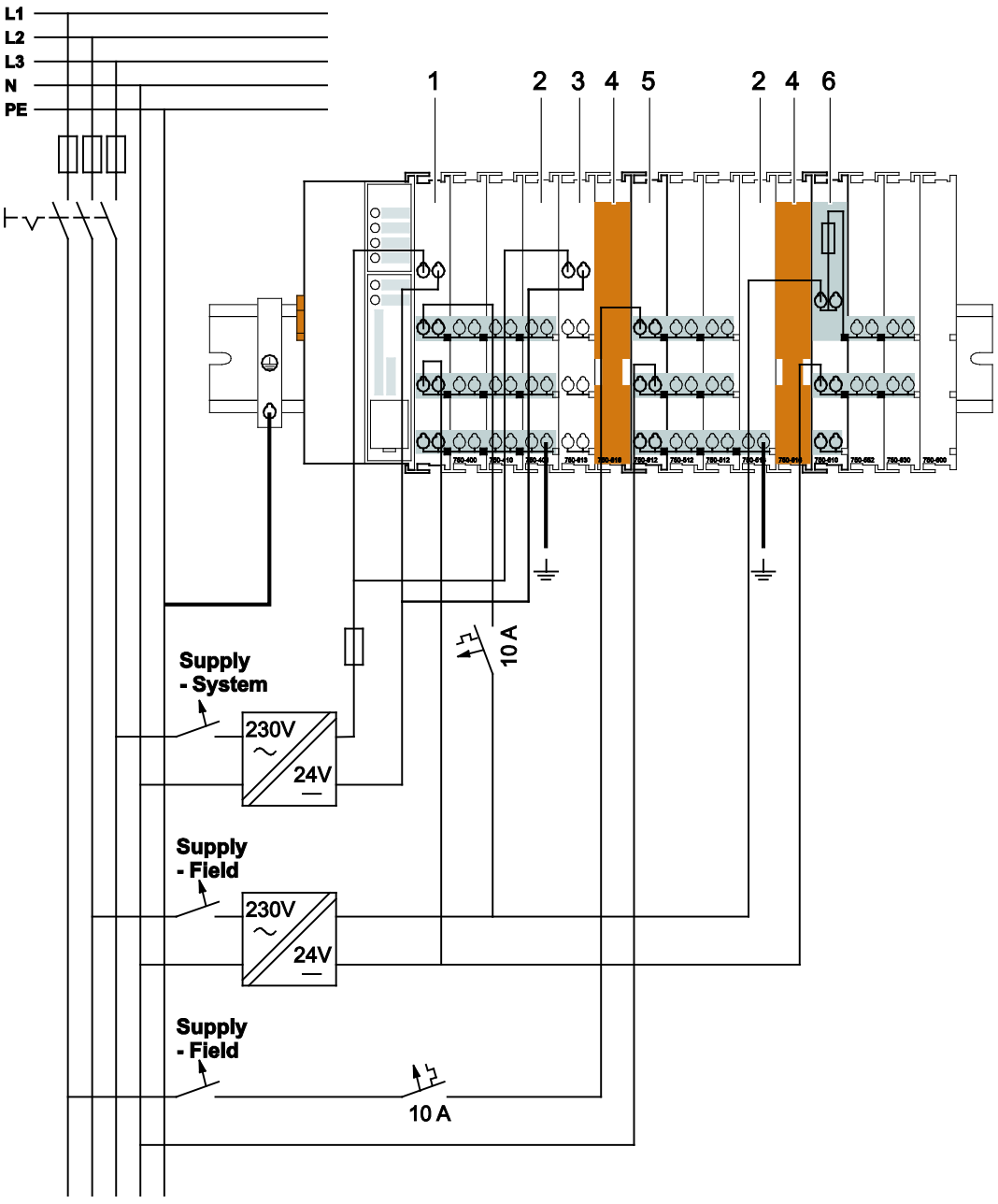

Figure 17: Supply Example for Standard Couplers/Controllers

Table 9: Legend for Figure “Supply Example for Fieldbus Coupler/Controller”

Pos.	Description
1	Power Supply on coupler via external Supply Module
2	Power Supply with optional ground
3	Internal System Supply Module
4	Separation module recommended
5	Supply Module passive
6	Supply Module with fuse carrier/diagnostics

3.5.6 Power Supply Unit

The WAGO-I/O-SYSTEM 750 requires a 24 VDC voltage (system supply).

Note

Recommendation
A stable power supply cannot always be assumed everywhere. Therefore, you should use regulated power supplies to ensure the quality of the supply voltage (see also table “WAGO power supply units”).

For brief voltage dips, a buffer (200 µF per 1 A load current) must be provided.

Note

Power failure time not acc. IEC 61131-2!
Note that the power failure time of 10 ms acc. IEC 61131-2 is not maintained in a maximum configuration.

The power demand must be determined individually depending on the entry point of the field supply. All loads through field devices and I/O modules must be taken into account. The field supply also impacts the I/O modules because the input and output drivers of some I/O modules require the voltage of the field supply.

Note

System and field supply must be isolated!
The system supply and field supply must be isolated to ensure bus operation in the event of short circuits on the actuator side.

Table 10: WAGO Power Supply Units (Selection)

WAGO Power Supply Unit	Description
787-612	Primary switched mode; DC 24 V; 2,5 A Input nominal voltage AC 230 V
787-622	Primary switched mode; DC 24 V; 5 A Input nominal voltage AC 230 V
787-632	Primary switched mode; DC 24 V; 10 A Input nominal voltage AC 230/115 V
 288-809 288-810 288-812 288-813	Rail-mounted modules with universal mounting carrier AC 115 V/DC 24 V; 0,5 A AC 230 V/DC 24 V; 0,5 A AC 230 V/DC 24 V; 2 A AC 115 V/DC 24 V; 2 A

3.6 Grounding

3.6.1 Grounding the DIN Rail

3.6.1.1 Framework Assembly

When setting up the framework, the carrier rail must be screwed together with the electrically conducting cabinet or housing frame. The framework or the housing must be grounded. The electrical connection is established via the screw. Thus, the carrier rail is grounded.

DANGER

Ensure sufficient grounding is provided!
You must take care to ensure the flawless electrical connection between the carrier rail and the frame or housing in order to guarantee sufficient grounding.

3.6.1.2 Insulated Assembly

Insulated assembly has been achieved when there is constructively no direct ohmic contact between the cabinet frame or machine parts and the carrier rail. Here, the earth ground must be set up via an electrical conductor in accordance with valid national safety regulations.

Note

Recommendation
The optimal setup is a metallic assembly plate with grounding connection which is electrically conductive linked to the carrier rail.

The separate grounding of the carrier rail can be easily set up with the aid of the WAGO ground wire terminals.

Table 11: WAGO Ground Wire Terminals

Order No.	Description
283-609	1-conductor ground (earth) terminal block make an automatic contact to the carrier rail; conductor cross section: 0.2 mm² … 16 mm² **Note**: Also order the end and intermediate plate (283-320).

3.6.2 Grounding Function

The grounding function increases the resistance against electro-magnetic interferences. Some components in the I/O system have a carrier rail contact that dissipates electro-magnetic interferences to the carrier rail.

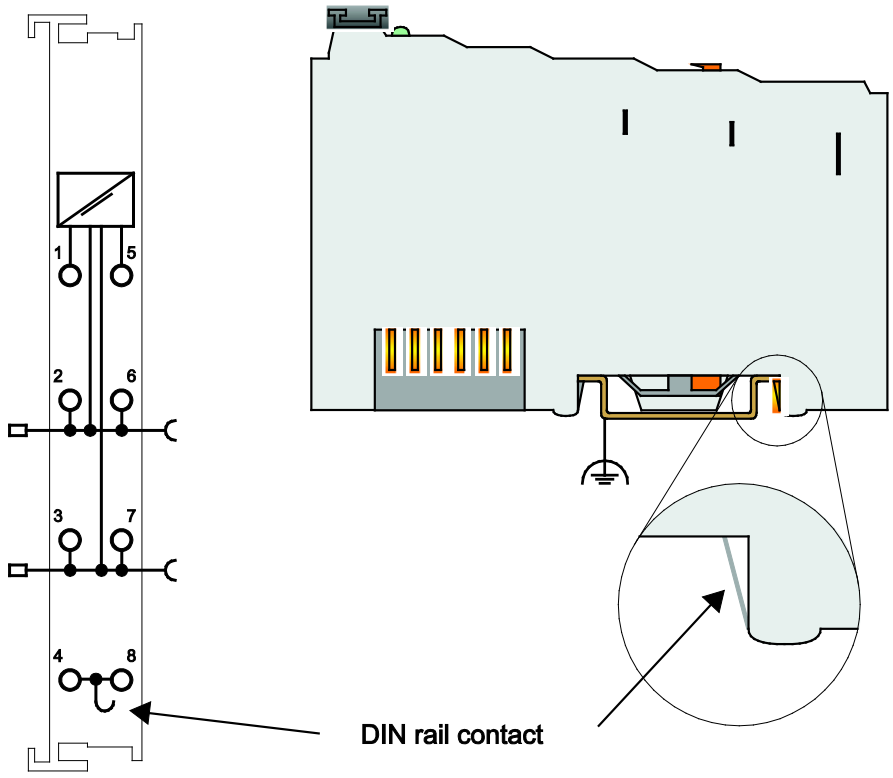

Figure 18: Carrier Rail Contact (Example)

DANGER

Ensure sufficient grounding is provided!
You must take care to ensure the direct electrical connection between the carrier rail contact and the carrier rail.
The carrier rail must be grounded.
For information on carrier rail properties, see section “Mounting” > … > “Carrier Rail Properties”.

The bottom CAGE CLAMP® connectors of the supply modules enable optional connection of a field-side functional ground. This potential is made available to the I/O module arranged on the right through the spring-loaded contact of the three power contacts. Some I/O modules are equipped with a knife-edge contact that taps this potential. This forms a potential group with regard to functional ground with the I/O module arranged on the left.

3.7 Shielding

3.7.1 General

Use of shielded cables reduces electromagnetic interference and thus increases signal quality. Measurement errors, data transmission errors and interference due to excessive voltage can be prevented.

Note

Connect the cable shield to the ground potential!
Integrated shielding is mandatory to meet the technical specifications in regards to measuring accuracy. Connect the cable shield and ground potential at the inlet to the cabinet or housing. This allows induced interference to dissipate and to be kept away from devices in the cabinet or housing.

Note

Improve shielding performance by placing the shield over a large area!
Higher shielding performance is achieved via low-impedance connection between shield and ground. For this purpose, connect the shield over a large surface area, e.g., WAGO shield connecting system. This is especially recommended for large-scale systems where equalizing current or high impulse-type currents caused by atmospheric discharge may occur.

Note

Keep data and signal lines away from sources of interference!
Route data and signal lines separately from all high voltage cables and other sources of high electromagnetic emission (e.g., frequency converter or drives).

3.7.2 Bus Cables

The shielding of the bus line is described in the respective configuration guidelines and standards of the bus system.

3.7.3 Signal Lines

I/O modules for analog signals and some interface I/O modules are equipped with shield clamps.

Note

Use shielded signal lines!
Only use shielded signal lines for analog signals and I/O modules which are equipped with shield clamps. Only then can you ensure that the accuracy and interference immunity specified for the respective I/O module can be achieved even in the presence of interference acting on the signal cable.

3.7.4 WAGO Shield Connecting System

The WAGO shield connecting system consists of shield clamping saddles, busbars and various mounting carriers. These components can be used to achieve many different configurations.

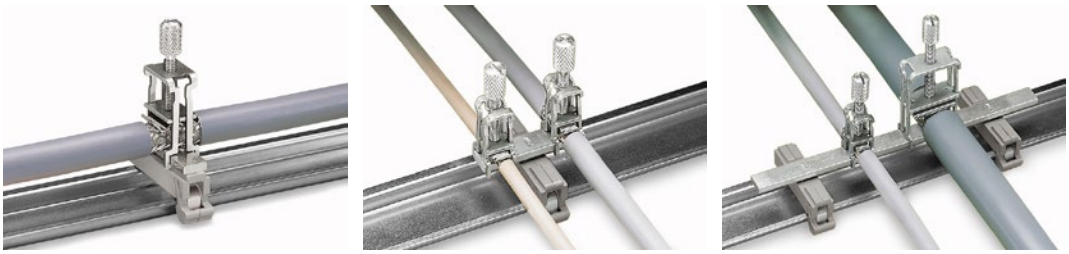

Figure 19: Examples of the WAGO Shield Connecting System

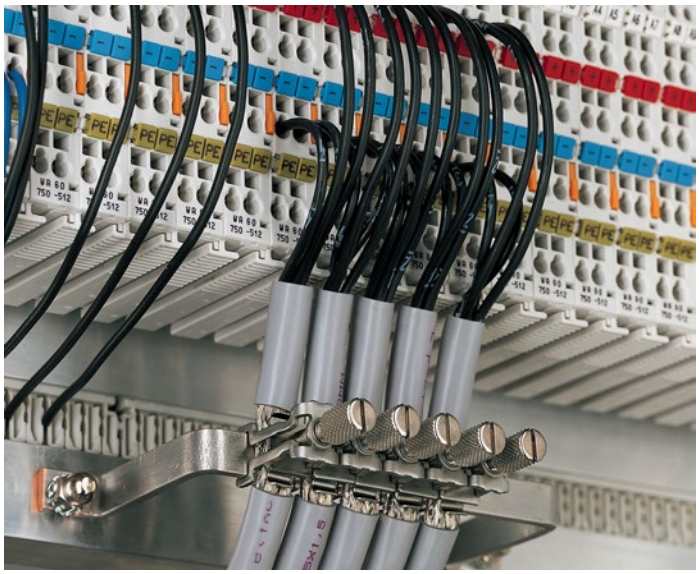

Figure 20: Application of the WAGO Shield Connecting System

4 Device Description

The 750-333 fieldbus coupler maps the peripheral data of all available I/O modules of the WAGO-I/O SYSTEM 750 on PROFIBUS DP.

In the initialization phase, the fieldbus coupler determines the physical structure of the node and creates a local process image with all inputs and outputs from the data that is obtained. In order to optimize addresses, the I/O modules with a bit width smaller than 8 can be grouped in one byte.

The physical structure of the fieldbus node may be individually adapted to the configuration of each system without changing the addressing of a global control application. This is done by parameterization of the fieldbus coupler and I/O modules accordingly with the aid of the planning environment (for instance, WAGO NETCON, COM PROFIBUS, SIMATIC Manager, Profi-Map, etc.).

The diagnostics concept is based on the identifier and channel-related diagnostics, as well as the module status and DP/V1 status messages according to EN 50170. Thus, there is no need for programming I/O modules for evaluating manufacturer-specific diagnostic data.

- Process data length
  Max. 244 bytes for input process image (128 bytes up to SW 02)
  Max. 244 bytes for output process image (128 bytes up to SW 02)
- Automatic recognition of the transmission speed on the PROFIBUS of 9.6 kbaud to 12 Mbaud.
- All I/O modules within the WAGO-I/O-SYSTEM 750/753 are supported
- Configuration modules can be parameterized as placeholders using or without using physical reserve modules (i. e. 753-1629).
- Configurable substitute values for each output channel in the event of failure
- D-Sub 9 pole bus connection

4.1 View

The view below shows the three parts of the device:

- The fieldbus connection is on the left side.
- LEDs for operation status, bus communication, error messages and diagnostics, as well as the service interface are in the middle area.
- The right side shows the power supply unit for the system supply and for the field supply of the attached I/O modules via power jumper contacts.
  LEDs show the status of the operating voltage for the system and field supply (jumper contacts).

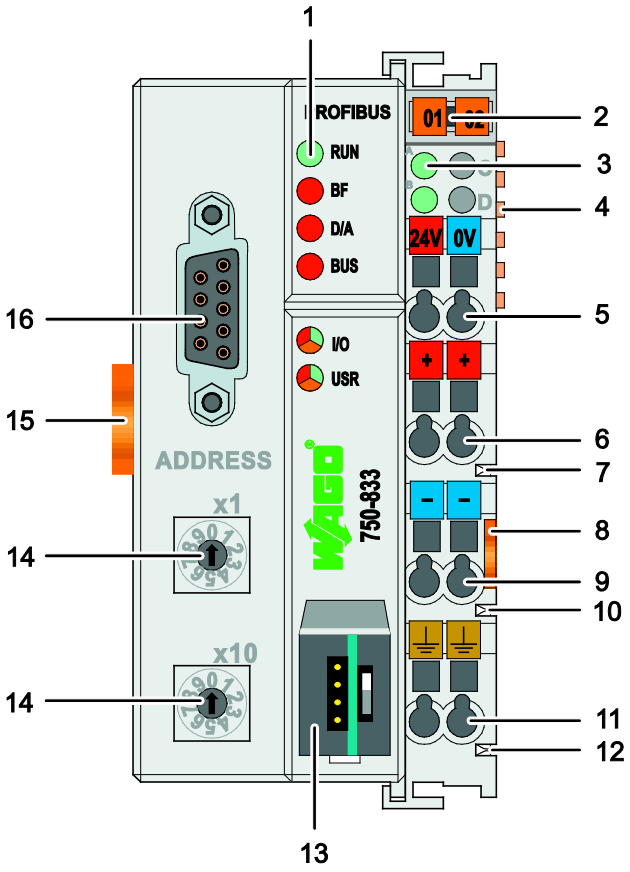

Figure 21: View Fieldbus Coupler PROFIBUS DP/V1

Table 12: Legend for figure “View Fieldbus Coupler PROFIBUS DP/V1”

Pos.	Desig-nation	Meaning	Details see Chapter:
1	RUN, BF, DIA, BUS, I/O	Status LEDs Fieldbus	“Device Description“ > “Display Elements“
2	---	Group marking carrier (retractable) with additional marking possibility on two miniature WSB markers	---
3	A, B or C	Status LED’s System/Field Supply	“Device Description” > “Display Elements”
4	---	Data Contacts	“Connect Devices” > “Data Contacts/Internal Bus”
5	24 V, 0 V	CAGE CLAMP® Connections System Supply	“Connect Devices” > “Connecting a conductor to the CAGE CLAMP®”
6	+	CAGE CLAMP® Connections Field Supply 24 VDC	“Connect Devices” > “Connecting a conductor to the CAGE CLAMP®”
7	---	Power Jumper Contact 24 VDC	“Connect Devices” > “Power Contacts/ Field Supply”
8	---	Unlocking Lug	“Mounting” > “Inserting and Removing Devices”
9	-	CAGE CLAMP® Connections Field Supply 0 V	“Connect Devices” > “Connecting a conductor to the CAGE CLAMP®”
10	---	Power Jumper Contact 0 V	“Connect Devices” > “Power Contacts/ Field Supply”
11	(Ground)	CAGE CLAMP® Connections Field Supply (Ground)	“Connect Devices” > “Connecting a conductor to the CAGE CLAMP®”
12	---	Power Jumper Contact (Ground)	“Connect Devices” > “Power Contacts/ Field Supply”
13	---	Service Interface (open flap)	“Device Description” > “Operating Elements”
14	---	Rotary encoder switch	“Device Description” > “Operating Elements”
15	---	Locking Disc	“Mounting” > “Inserting and Removing Devices”
16	---	RS-485 connection via a D-Sub9 connector	“Device Description” > “Connections“

4.2 Connectors

4.2.1 Device Supply

The device is powered via terminal blocks with CAGE CLAMP® connections.

The device supply generates the necessary voltage to power the electronics of the device and the internal electronics of the connected I/O modules.

The fieldbus interface is galvanically separated to the electrical potential of the device.

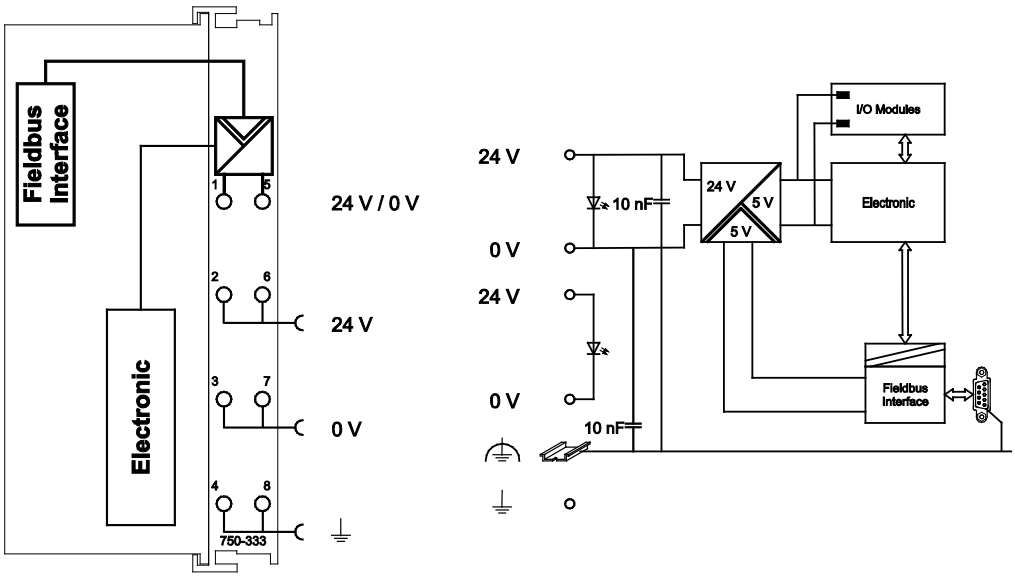

Figure 22: Device Supply

4.2.2 Fieldbus Connection

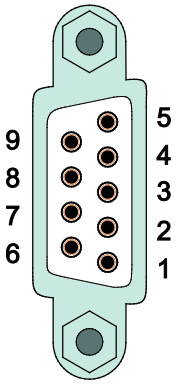

Figure 23: Pin assignment for D-Sub fieldbus connection (female)

The D-Sub connector for the RS-485 interface is wired as follows:

Table 13: Signal assignment of the RS-485 interface

Pin	Signal	1:1	PC connection	Description
1	-	--------	-	Not used
2	-	--------	-	Not used
3	RxD	--------	TxD-P	Transmit signal
4	RTS	--------	RTS	Request to send; logical Zero = ready for data receipt
5	GND	--------	GND	Signal and supply ground
6	Vcc	--------	-	Supply voltage
7	-	--------	-	Not used
8	RxD	--------	TxD-N	Transmit signal
9	-	--------	-	Not used

The connection point is lowered for mounting into an 80 mm-high switchgear cabinet after connector attachment.

4.3 Display Elements

The operating condition of the fieldbus coupler or the node is displayed with the help of illuminated indicators in the form of light-emitting diodes (LEDs).
The LED information is routed to the top of the case by light guides. In some cases, the LEDs are multi-colored (red, green or orange).

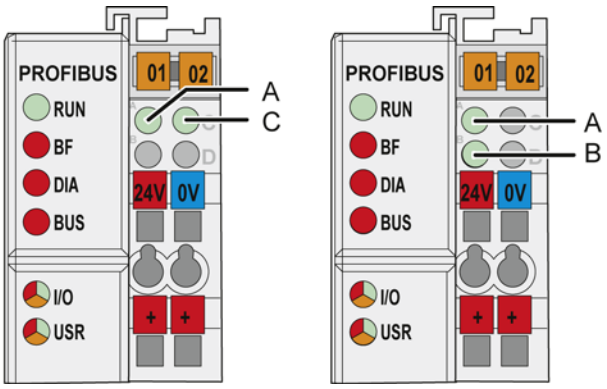

Figure 24: Display Elements (two manufacturing variations)

For the diagnostics of the different domains fieldbus, node and supply voltage, the LEDs can be divided into three groups:

Table 14: Display Elements Fieldbus Status

LED	Color	Meaning
RUN	green	Shows the user whether the fieldbus coupler/controller is functioning correctly.
BF	red	Indicates whether communication via the PROFIBUS is functioning.
DIA	red	Indicates external diagnostics. The signaling is not supported by all devices.
BUS	red	Indicates a PROFIBUS parameterization or configuration error.

Table 15: Display Elements Node Status

LED	Color	Meaning
I/O	red/green/ orange	Indicates the operation of the node and signals via a blink code faults encountered.

Table 16: Display Elements Supply Voltage

LED	Color	Meaning
A	green	Indicates the status of the operating voltage – system
B or C	green	Indicates the status of the operating voltage – power jumper contacts (LED is manufacturing dependent either on position B or C)

Information

More information about the LED Signaling
Read the detailed description for the evaluation of the displayed LED state in the section “Diagnostics” > … > “LED Signaling”.

4.4 Operating Elements

4.4.1 Service Interface

The service interface is located behind the flap.

It is used for the communication with the WAGO-I/O-*CHECK* and for downloading the firmware updates.

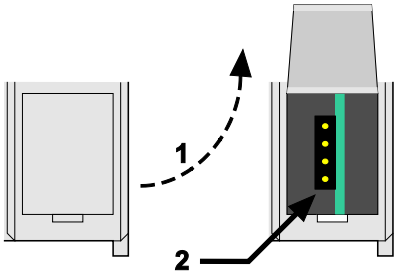

Figure 25: Service Interface (closed and opened flap)

Table 17: Legend for figure “Service Interface (closed and opened flap)”

Number	Description
1	Open closed
2	View Service Interface

NOTICE

Device must be de-energized!
To prevent damage to the device, unplug and plug in the communication cable only when the device is de-energized!

The connection to the 4-pin header under the cover flap can be realized via the communication cables with the item numbers750-920 and 750-923 or via the WAGO radio adapter with the item number 750-921.

4.4.2 Rotary Encoder Switch Station Address

Two decimal rotary encoder switches on the fieldbus coupler/controller are used to set the station address.

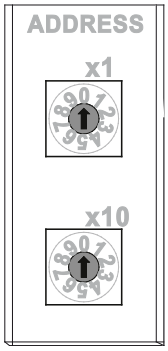

Figure 26: Rotary Encoder Switch Station Address

The “x1” switch determines the unit position of the address.
The “x10” switch determines the tens position of the address.
Valid station addresses for the fieldbus coupler fall between 0 and 99 and for the fieldbus controller between 1 and 99.

The fieldbus coupler/controller takes over the station address set in the initialization phase after switching on.

If the station address is changed during operation by a rotary coding switch, the change only takes effect after restarting the system.

4.5 Technical Data

4.5.1 Device Data

Table 18: Technical Data - Device

Width	50 mm
Height (from upper edge of DIN 35 rail)	65* mm (*from upper edge of DIN 35 rail)
Length	100 mm
Weight	195 g
Degree of protection	IP 20

4.5.2 System Data

Table 19: Technical Data - System

No. of I/O modules connected to Master	96 with repeater
Max. no. of I/O points	approx. 6000 (depends on master)
Transmission medium	Cu cable acc. to EN 50170
Max. length of fieldbus segment	100 m ... 1200 m (depends on baud rate/cable)
Baud rate	9.6 kbaud ... 12 Mbaud
Transmission time (10 couplers; 32 digital I/Os per coupler at 12 Mbaud)	typ. 1 ms max. 3.3 ms
Bus coupler connection	1 x D-Sub 9; socket
Protocols	DP/V0, DP/V1
Number of I/O modules	63
Max. input process image	244 Byte (128 Byte at SW02)
Max. output process image	244 Byte (128 Byte at SW02)
Configuration	via PC or controller

4.5.3 Supply

Table 20: Technical Data - Supply

Voltage Supply	24 VDC (-25 % ... +30 %)
Input current $_{max.}$ (24 V)	500 mA
Efficiency of the power supply	87 %
Internal current consumption (5 V)	200 mA at 5 V
Total current for I/O modules (5 V)	1800 mA at 5 V
Isolation	500 V system/supply
Voltage via power jumper contacts	DC 24 V (-25 % ... +30 %)
Current via power jumper contacts max.	max. DC 10 A
Current via PROFIBUS interface (D-Sub9, Pin 5 and 6)	max. 80 mA at 5 V

4.5.4 Accessories

Table 21: Technical Data – Accessories

Miniature WSB Quick marking system

4.5.5 Safe electrical Isolation

Table 22: Technical Data – Safe electrical Isolation

Air and creepage distance	Acc. to IEC 60664-1
Degree of pollution acc. to IEC 61131-2	2

4.5.6 Connection Type

Table 23: Technical Data – Field Wiring

Wire connection	CAGE CLAMP®
Cross section	0.08 mm² … 2.5 mm², AWG 28 … 14
Stripped lengths	8 mm … 9 mm / 0.33 in

Table 24: Technical Data – Power Jumper Contacts

Power jumper contacts	spring contact, self-cleaning
Voltage drop at I $_{max.}$	< 1 V/64 modules

Table 25: Technical Data – Data Contacts

Data contacts	Slide contact, hard gold plated, self-cleaning

4.5.7 Climatic Environmental Conditions

Table 26: Technical Data – Climatic Environmental Conditions

Operating temperature range	0 °C … 55 °C
Operating temperature range for components with extended temperature range (750-xxx/025-xxx)	-20 °C … +60 °C
Storage temperature range	-25 °C … +85 °C
Storage temperature range for components with extended temperature range (750-xxx/025-xxx)	-40 °C … +85 °C
Relative humidity	Max. 5 % … 95 % without condensation
Resistance to harmful substances	Acc. to IEC 60068-2-42 and IEC 60068-2-43
Maximum pollutant concentration at relative humidity < 75 %	$SO_2 \leq 25$ ppm $H_2S \leq 10$ ppm
Special conditions	Ensure that additional measures for components are taken, which are used in an environment involving: – dust, caustic vapors or gases – ionizing radiation

4.6 Approvals

Information

More information about approvals.
Detailed references to the approvals are listed in the document “Overview Approvals **WAGO-I/O-SYSTEM 750**”, which you can find via the internet under: www.wago.com > SERVICES > DOWNLOADS > Additional documentation and information on automation products > WAGO-I/O-SYSTEM 750 > System Description.

The following approvals have been granted to the basic version and all variations of 750-333 fieldbus couplers/controllers:

Conformity Marking

cULus UL508

Korea Certification MSIP-REM-W43-FBC750

The following Ex approvals have been granted to the basic version of 750-333 fieldbus coupler/controller and their variations 750-333/xxxx-xxxx:

TÜV 07 ATEX 554086 X

I M2 Ex d I Mb
II 3 G Ex nA IIC T4 Gc
II 3 D Ex tc IIIC T135°C Dc

Permissible ambient temperature range:

- Standard: 0 °C ≤ T_a ≤ +60 °C
- Variants with extended temperature range (750-xxx/025-xxx): -20 °C ≤ T_a ≤ +60 °C

IECEx TUN 09.0001 X

Ex d I Mb
Ex nA IIC T4 Gc
Ex tc IIIC T135°C Dc

Permissible ambient temperature range:

- Standard: 0 °C ≤ T_a ≤ +60 °C
- Variants with extended temperature range (750-xxx/025-xxx): -20 °C ≤ T_a ≤ +60 °C

The following Ex approvals have been granted to the basic version of 750-333 fieldbus coupler/controller:

Brasilian-Ex	TUEV 12.1297 X Ex nA IIC T4 Gc
	$_{C}UL_{US}$ ANSI/ISA 12.12.01 Class I, Div2 ABCD T4

The following ship approvals have been granted to 750-333 and 750-333 /025-000 fieldbus coupler/controller:

	ABS	BSH	BV	DNV	GL	KR	LR	NKK	PRS	RINA
750-333	x	x	x	x	x	x	x	x	x	x
/025-000		x			x					

ABS (American Bureau of Shipping)

Federal Maritime and Hydrographic Agency

BV (Bureau Veritas)

DNV (Det Norske Veritas) Class B

GL (Germanischer Lloyd) Cat. A, B, C, D (EMC 1)

KR (Korean Register of Shipping)

LR (Lloyd's Register) Env. 1, 2, 3, 4

NKK (Nippon Kaiji Kyokai)

PRS (Polski Rejestr Statków)

RINA (Registro Italiano Navale)

Information

For more information about the ship approvals:
Note the "Supplementary Power Supply Regulations" section for the ship approvals.

4.7 Standards and Guidelines

750-333 meets the following requirements on emission and immunity of interference:

EMC CE-Immunity to interference	acc. to EN 61000-6-2: 2005
EMC CE-Emission of interference	acc. to EN 61000-6-4: 2007
EMC marine applications-Immunity to interference	acc. to Germanischer Lloyd (2003)
EMC marine applications-Emission of interference	acc. to Germanischer Lloyd (2003)

5 Mounting

5.1 Installation Position

Along with horizontal and vertical installation, all other installation positions are allowed.

Note

Use an end stop in the case of vertical mounting!
In the case of vertical assembly, an end stop has to be mounted as an additional safeguard against slipping.
WAGO order no. 249-116 End stop for DIN 35 rail, 6 mm wide
WAGO order no. 249-117 End stop for DIN 35 rail, 10 mm wide

5.2 Overall Configuration

The maximum total length of a fieldbus node without fieldbus coupler/controller is 780 mm including end module. The width of the end module is 12 mm. When assembled, the I/O modules have a maximum length of 768 mm.

Examples:

- 64 I/O modules with a 12 mm width can be connected to a fieldbus coupler/controller.
- 32 I/O modules with a 24 mm width can be connected to a fieldbus coupler/controller.

Exception:

The number of connected I/O modules also depends on the type of fieldbus coupler/controller is used. For example, the maximum number of stackable I/O modules on one PROFIBUS DP/V1 fieldbus coupler/controller is 63 with no passive I/O modules and end module.

NOTICE

Observe maximum total length of a fieldbus node!
The maximum total length of a fieldbus node without fieldbus coupler/controller and without using a 750-628 I/O Module (coupler module for internal data bus extension) may not exceed 780 mm.
Also note the limitations of individual fieldbus couplers/controllers.

Note

Increase the total length using a coupler module for internal data bus extension!

You can increase the total length of a fieldbus node by using a 750-628 I/O Module (coupler module for internal data bus extension). For such a configuration, attach a 750-627 I/O Module (end module for internal data bus extension) after the last I/O module of a module assembly. Use an RJ-45 patch cable to connect the I/O module to the coupler module for internal data bus extension of another module block.

This allows you to segment a fieldbus node into a maximum of 11 blocks with maximum of 10 I/O modules for internal data bus extension.

The maximum cable length between two blocks is five meters.

More information is available in the manuals for the 750-627 and 750-628 I/O Modules.

5.3 Mounting onto Carrier Rail

5.3.1 Carrier Rail Properties

All system components can be snapped directly onto a carrier rail in accordance with the European standard EN 50022 (DIN 35).

NOTICE

Do not use any third-party carrier rails without approval by WAGO!
WAGO Kontakttechnik GmbH & Co. KG supplies standardized carrier rails that are optimal for use with the I/O system. If other carrier rails are used, then a technical inspection and approval of the rail by WAGO Kontakttechnik GmbH & Co. KG should take place.

Carrier rails have different mechanical and electrical properties. For the optimal system setup on a carrier rail, certain guidelines must be observed:

- The material must be non-corrosive.
- Most components have a contact to the carrier rail to ground electro-magnetic disturbances. In order to avoid corrosion, this tin-plated carrier rail contact must not form a galvanic cell with the material of the carrier rail which generates a differential voltage above 0.5 V (saline solution of 0.3 % at 20°C).
- The carrier rail must optimally support the EMC measures integrated into the system and the shielding of the I/O module connections.
- A sufficiently stable carrier rail should be selected and, if necessary, several mounting points (every 20 cm) should be used in order to prevent bending and twisting (torsion).
- The geometry of the carrier rail must not be altered in order to secure the safe hold of the components. In particular, when shortening or mounting the carrier rail, it must not be crushed or bent.
- The base of the I/O components extends into the profile of the carrier rail. For carrier rails with a height of 7.5 mm, mounting points are to be riveted under the node in the carrier rail (slotted head captive screws or blind rivets).
- The medal springs on the bottom of the housing must have low-impedance contact with the DIN rail (wide contact surface is possible).

5.3.2 WAGO DIN Rail

WAGO carrier rails meet the electrical and mechanical requirements shown in the table below.

Table 27: WAGO DIN Rail

Order number	Description
210-113 /-112	35 x 7.5; 1 mm; steel yellow chromated; slotted/unslotted
210-114 /-197	35 x 15; 1.5 mm; steel yellow chromated; slotted/unslotted
210-118	35 x 15; 2.3 mm; steel yellow chromated; unslotted
210-198	35 x 15; 2.3 mm; copper; unslotted
210-196	35 x 7.5; 1 mm; aluminum; unslotted

5.4 Spacing

The spacing between adjacent components, cable conduits, casing and frame sides must be maintained for the complete fieldbus node.

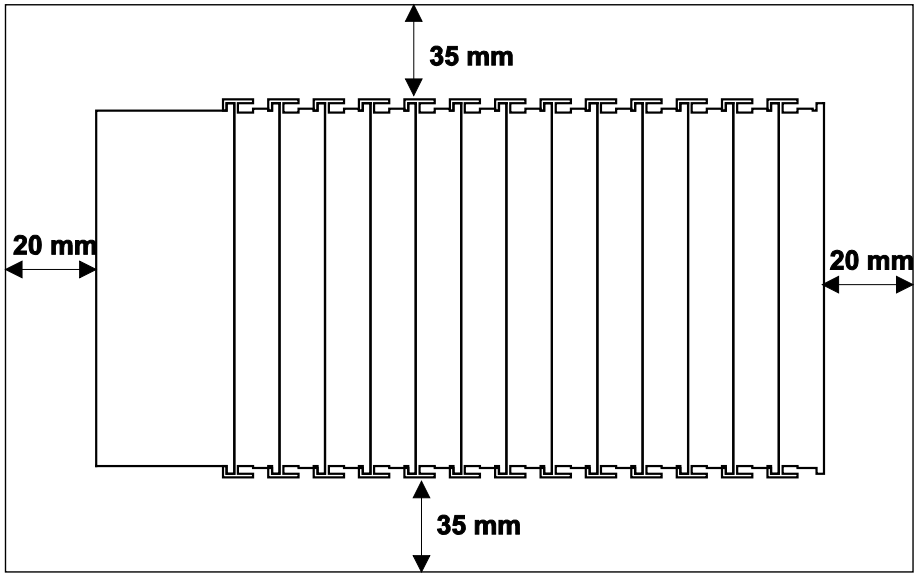

Figure 27: Spacing

The spacing creates room for heat transfer, installation or wiring. The spacing to cable conduits also prevents conducted electromagnetic interferences from influencing the operation.

5.5 Mounting Sequence

Fieldbus couplers/controllers and I/O modules of the WAGO-I/O-SYSTEM 750 are snapped directly on a carrier rail in accordance with the European standard EN 50022 (DIN 35).

The reliable positioning and connection is made using a tongue and groove system. Due to the automatic locking, the individual devices are securely seated on the rail after installation.

Starting with the fieldbus coupler/controller, the I/O modules are mounted adjacent to each other according to the project design. Errors in the design of the node in terms of the potential groups (connection via the power contacts) are recognized, as the I/O modules with power contacts (blade contacts) cannot be linked to I/O modules with fewer power contacts.

⚠ CAUTION

Risk of injury due to sharp-edged blade contacts!
The blade contacts are sharp-edged. Handle the I/O module carefully to prevent injury.

NOTICE

Insert I/O modules only from the proper direction!
All I/O modules feature grooves for power jumper contacts on the right side. For some I/O modules, the grooves are closed on the top. Therefore, I/O modules featuring a power jumper contact on the left side cannot be snapped from the top. This mechanical coding helps to avoid configuration errors, which may destroy the I/O modules. Therefore, insert I/O modules only from the right and from the top.

Note

Don't forget the bus end module!
Always plug a bus end module 750-600 onto the end of the fieldbus node! You must always use a bus end module at all fieldbus nodes with WAGO-I/O-SYSTEM 750 fieldbus couplers/controllers to guarantee proper data transfer.

5.6 Inserting and Removing Devices

NOTICE

Perform work on devices only if they are de-energized!
Working on energized devices can damage them. Therefore, turn off the power supply before working on the devices.

5.6.1 Inserting the Fieldbus Coupler/Controller

1. When replacing the fieldbus coupler/controller for an already available fieldbus coupler/controller, position the new fieldbus coupler/controller so that the tongue and groove joints to the subsequent I/O module are engaged.

2. Snap the fieldbus coupler/controller onto the carrier rail.

3. Use a screwdriver blade to turn the locking disc until the nose of the locking disc engages behind the carrier rail (see the following figure). This prevents the fieldbus coupler/controller from canting on the carrier rail.

With the fieldbus coupler/controller snapped in place, the electrical connections for the data contacts and power contacts (if any) to the possible subsequent I/O module are established.

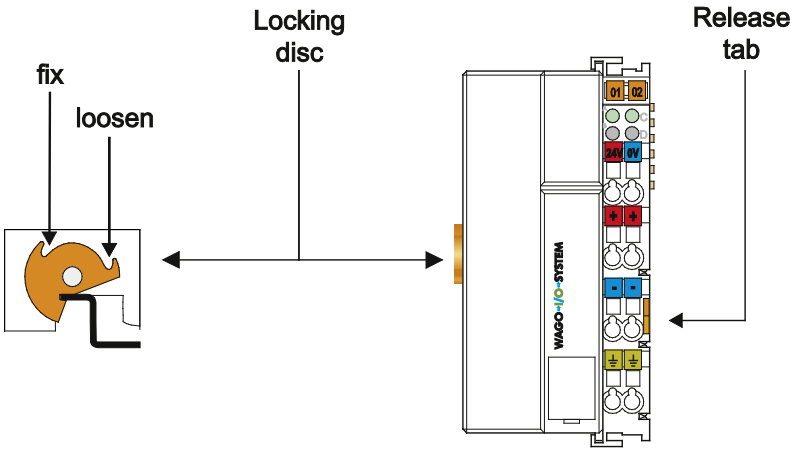

Figure 28: Release Tab Standard Fieldbus Coupler/Controller (Example)

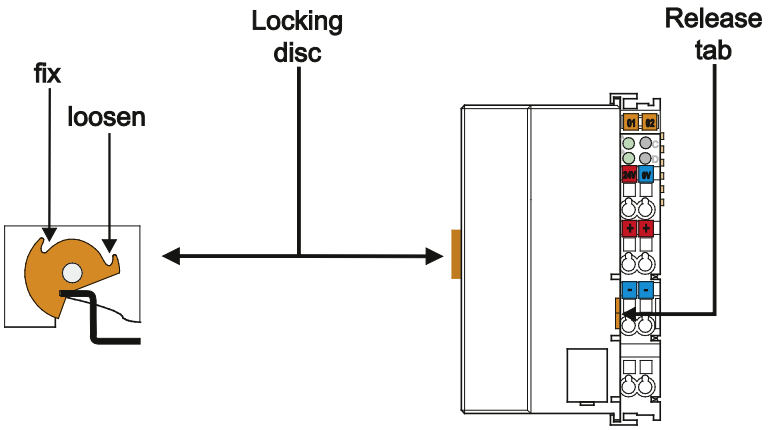

Figure 29: Release Tab of Extended ECO Fieldbus Coupler (Example)

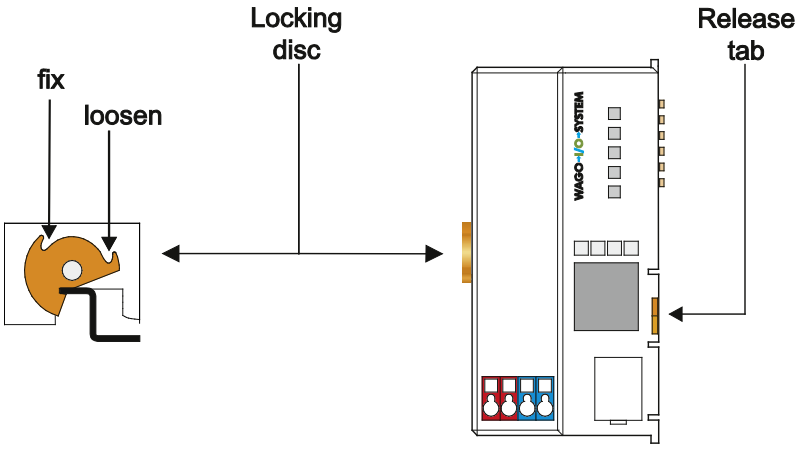

Figure 30: Release Tab ECO Coupler

5.6.2 Removing the Fieldbus Coupler/Controller

1. Use a screwdriver blade to turn the locking disc until the nose of the locking disc no longer engages behind the carrier rail.

2. Remove the fieldbus coupler/controller from the assembly by pulling the release tab.

Electrical connections for data or power contacts to adjacent I/O modules are disconnected when removing the fieldbus coupler/controller.

5.6.3 Inserting the I/O Module

1. Position the I/O module so that the tongue and groove joints to the fieldbus coupler/controller or to the previous or possibly subsequent I/O module are engaged.

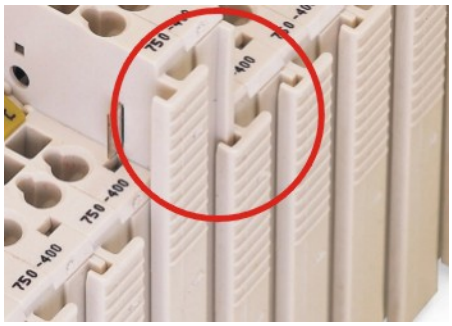

Figure 31: Insert I/O Module (Example)

2. Press the I/O module into the assembly until the I/O module snaps into the carrier rail.

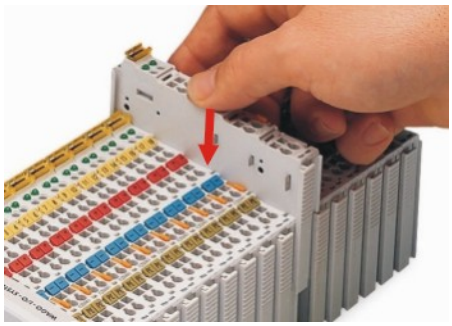

Figure 32: Snap the I/O Module into Place (Example)

With the I/O module snapped in place, the electrical connections for the data contacts and power jumper contacts (if any) to the fieldbus coupler/controller or to the previous or possibly subsequent I/O module are established.

5.6.4 Removing the I/O Module

1. Remove the I/O module from the assembly by pulling the release tab.

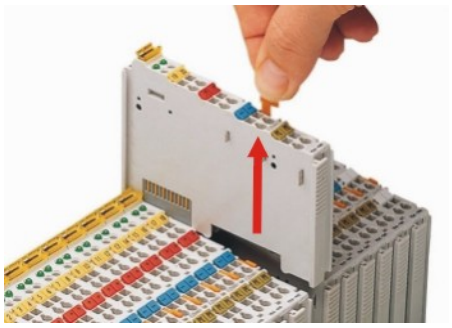

Figure 33: Removing the I/O Module (Example)

Electrical connections for data or power jumper contacts are disconnected when removing the I/O module.

6 Connect Devices

6.1 Data Contacts/Internal Bus

Communication between the fieldbus coupler/controller and the I/O modules as well as the system supply of the I/O modules is carried out via the internal bus. It is comprised of 6 data contacts, which are available as self-cleaning gold spring contacts.

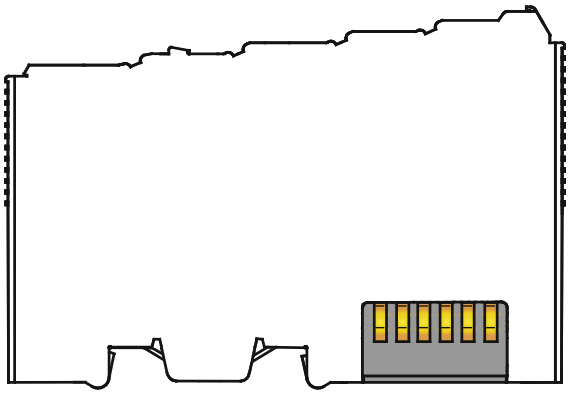

Figure 34: Data Contacts

NOTICE

Do not place the I/O modules on the gold spring contacts!
Do not place the I/O modules on the gold spring contacts in order to avoid soiling or scratching!

NOTICE

Ensure that the environment is well grounded!
The devices are equipped with electronic components that may be destroyed by electrostatic discharge. When handling the devices, ensure that the environment (persons, workplace and packing) is well grounded. Avoid touching conductive components, e.g. data contacts.

6.2 Power Contacts/Field Supply

⚠ CAUTION

Risk of injury due to sharp-edged blade contacts!
The blade contacts are sharp-edged. Handle the I/O module carefully to prevent injury.

Self-cleaning power jumper contacts used to supply the field side are located on the right side of most of the fieldbus couplers/controllers and on some of the I/O modules. These contacts come as touch-proof spring contacts. As fitting counterparts the I/O modules have male contacts on the left side.

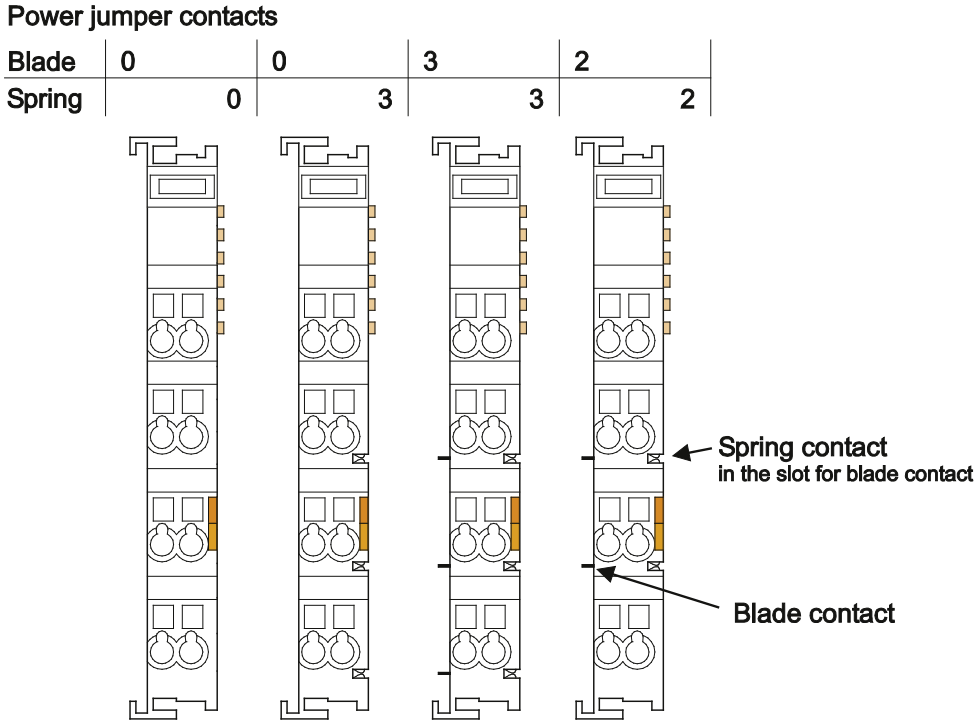

Figure 35: Example for the Arrangement of Power Contacts

Note

Field bus node configuration and test via smartDESIGNER
With the WAGO ProServe® Software smartDESIGNER, you can configure the structure of a field bus node. You can test the configuration via the integrated accuracy check.

6.3 Connecting a Conductor to the CAGE CLAMP®

The WAGO CAGE CLAMP® connection is appropriate for solid, stranded and finely stranded conductors.

Note

Only connect one conductor to each CAGE CLAMP®!
Only one conductor may be connected to each CAGE CLAMP®.
Do not connect more than one conductor at one single connection!

If more than one conductor must be routed to one connection, these must be connected in an up-circuit wiring assembly, for example using WAGO feed-through terminals.

Exception:
If it is unavoidable to jointly connect 2 conductors, then you must use a ferrule to join the wires together. The following ferrules can be used:

Length:	8 mm
Nominal cross section $_{max.}$:	1 mm^2 for 2 conductors with 0.5 mm^2 each
WAGO product:	216-103 or products with comparable properties

1. For opening the CAGE CLAMP® insert the actuating tool into the opening above the connection.
2. Insert the conductor into the corresponding connection opening.
3. For closing the CAGE CLAMP® simply remove the tool. The conductor is now clamped firmly in place.

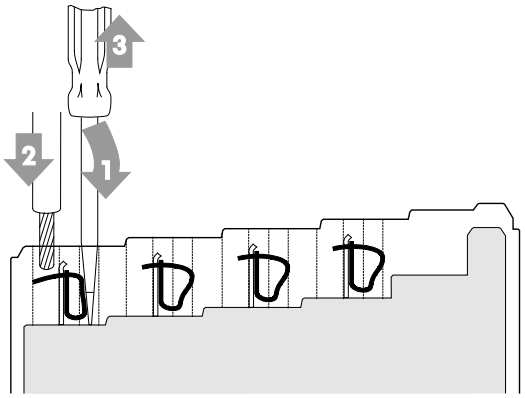

Figure 36: Connecting a Conductor to a CAGE CLAMP®

7 Function Description

7.1 Operating System

After master configuration and electrical installation of the fieldbus station, the system is operative.

The fieldbus coupler begins running up after switching on the power supply or after a reset.

Upon initialization, the fieldbus coupler determines the connected I/O modules and the current configuration. During this phase, the I/O LED flashes red.
After trouble-free startup, the fieldbus coupler enters “Fieldbus start” mode and the RUN LED flashes in green.
After bus data exchange, the I/O LED lights up green.
If an error occurs during start-up, the I/O LED flashes red and a flash code indicates the corresponding error message.

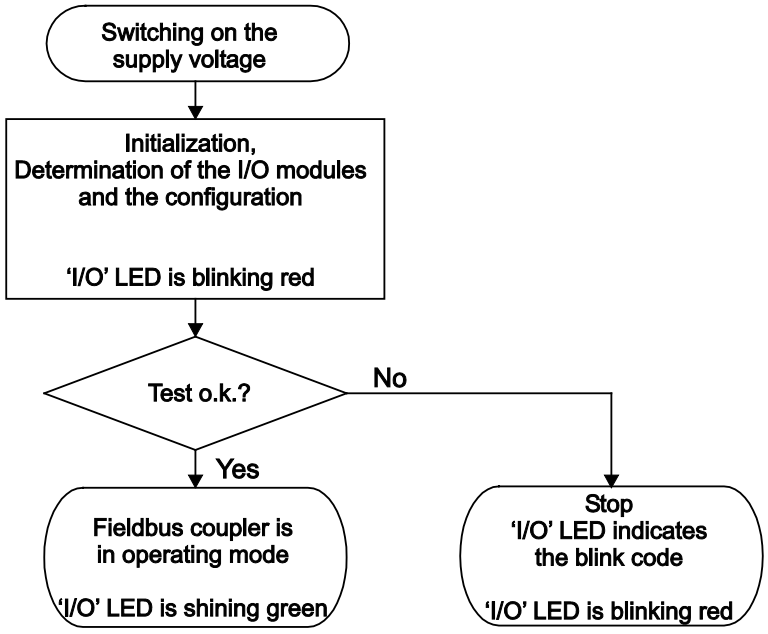

Figure 37: Operating System

Information

More information about the LED Signaling
Read the detailed description for the evaluation of the displayed LED state in the section “Diagnostics” > … > “LED Signaling”.

7.2 Process Data Architecture

7.2.1 Basic Structure

A node can consist of a mixed arrangement of analog and digital, system and special function modules.

For the configuration only I/O modules are taken into account, which exchange process data on the internal bus (K-Bus) with the fieldbus coupler (data width or bit width greater than 0).

The controller creates an internal local process image on the basis of the data width, the type of I/O module and the position of the module in the node. This process image is separated into input and output data range.

Information

Additional Information
For the number of input and output bits or bytes of the individual I/O modules, refer to the corresponding description of the I/O modules.

For both, the local input and output process image, the I/O module data is stored in the corresponding process image depending on the order in which the modules are connected to the coupler/controller.

7.2.1.1 Allocation of the Input and Output Data

The process data is exchanged via the PROFIBUS with the higher ranking controls (master). A maximum of 244 bytes (128 bytes up to SW 02) of data is transmitted from the master to the node. The fieldbus coupler/controller responds by returning a maximum of 244 bytes (128 bytes up to SW 02) input data to the master.

Modules are configured according to their physical arrangement when projecting the node, which can be taken over from a hardware catalogue of the configuration programs. The information covering the possible modules is contained in the GSD files.

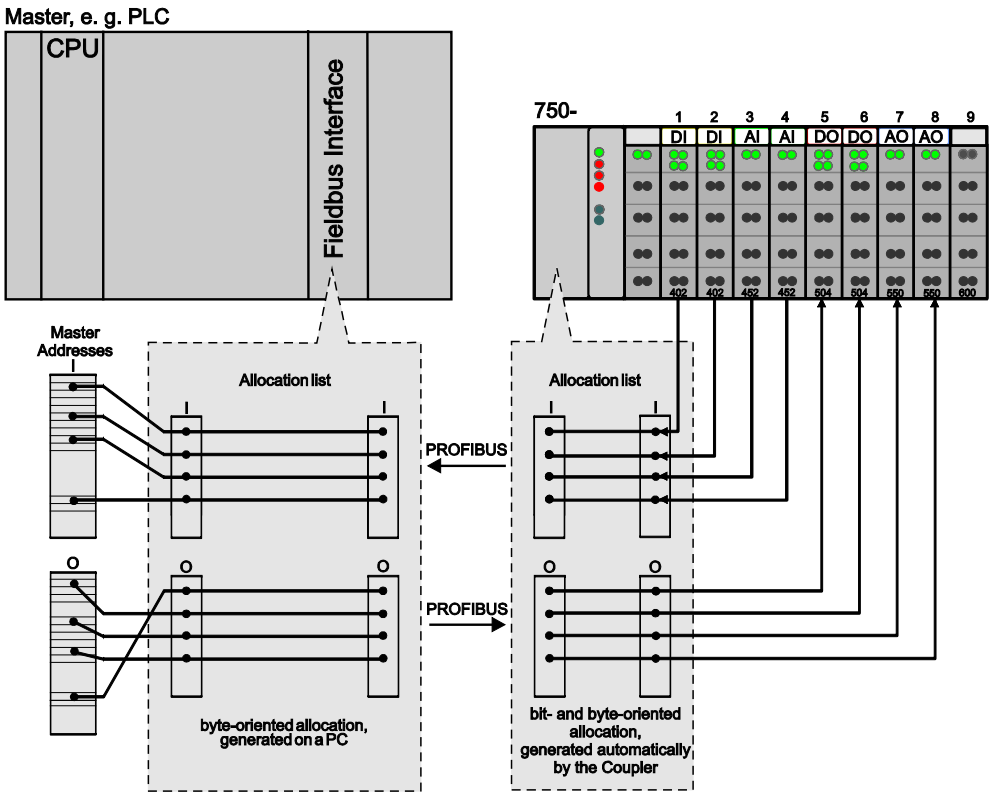

Fig. 38: Allocation of the input and output data

7.2.2 Configuration of process data for PROFIBUS DP

For some I/O modules (and their variants), the architecture of the process data depends on the fieldbus.

Based on the configuration of the PROFIBUS fieldbus coupler, the data bytes (D0 ... Dn) for the word and double-word-oriented modules are transmitted in a Motorola or Intel format via PROFIBUS.

Information

Additional Information:
For the fieldbus-specific process image of any WAGO I/O module, please refer to the section “PI Configuration”.

8 Commissioning

This section shows a step-by-step procedure for starting up exemplarily a WAGO fieldbus node.

8.1 Planning

The node is planned in accordance with the physical arrangement of fieldbus coupler/controller and I/O modules.

The fieldbus coupler/controller or process data channel is to be configured on the first slot.
The other slots are configured according to the physical arrangement of the I/O modules. Only I/O modules with process data are relevant. The supply modules without diagnostics, bus power supply module, field side connection module, separation module and end module are not used for configuration because they do not provide any process data.

Depending on the I/O module, there are 1 or 2 modules available in the hardware catalog.
The I/O modules appear as 750-xyz ..., e.g. 750-400 2 DI/24 V DC/3.0 ms.

For all digital I/O modules with a channel granularity of 2 and 4, the entry *750-xyz ... is listed.
When using these configuration modules, the fieldbus coupler/controller adds the binary information of the current I/O module to a byte previously opened with 750-xyz ....
The use of a “*” configuration module is only permitted when the information available is less than or identical to the remaining bits in the previously opened byte.
The digital I/O modules combined in one byte can be spatially separated from each other. There can be digital I/O modules of another signal type or byte-oriented I/O modules between the modules.

To configure the scope of the available peripheral devices individually and independently of the control program, it is possible to parameterize the I/O modules in the configuration table as “(optional) no plug fitted”.
In this manner, the process data still on the PROFIBUS DP can be filtered for the individual I/O module and not transmitted to the periphery or read by it.

8.2 GSD Files

With PROFIBUS DP, the devices' power features are defined by the manufacturer in a GSD file (General Station Description or device master data file) and made available to the user.

Structure, content and coding of this device master data are standardized, allowing configuration of any DP slaves via configuration devices from various manufacturers.

Information

More information on the GSD files
The “GSD files for PROFIBUS with installation program” (Item No. 750-910) can be downloaded on the website http://www.wago.com under Downloads.

1. Unpack the archive.
2. Double-click the "GSD_Setup_Vxx.exe" (xx = version) to launch the setup program.
3. Follow the instructions in the setup program for installing the GSD files.

The GSD files are read by the configuration software and the corresponding settings are transferred. Refer to the software user manuals for the required entries and handling steps.

8.3 Identifier Bytes

Both the process data channel of the fieldbus coupler and the connected I/O modules are configured.

The configuration results in a slot-based compilation of identifier bytes, usually one byte per slot.

This compilation determines the structure and scope of input and/or output data transferred during data exchange between the PROFIBUS master and fieldbus coupler.

The PROFIBUS master transmits the identifier byte arrangement via a configuration telegram for testing and possibly adjusting the target and actual configuration.

Input and/or output data up to 16 words can be written with the general identifier format, which occupies one identifier byte in the configuration telegram.

Table 28: Identifier bytes – configuration identifier in the general identifier format

Byte	Information							
	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
0								

Data length
0000_B: 1 Byte/Word
0001_B: 2 Bytes/Words
...
1111_B: 16 Bytes/Words

In-/output
00_B: Reserved for special identifier format
01_B: Input
10_B: Output
11_B: In-/Output

Organization
0_B: Byte
1_B: Word

Consistency
0_B: By byte/word
1_B: Over the total length

For process data lengths of 17 to max. 64 words, the special identifier format has to be used for the configuration. It includes min. 2 and max. 17 bytes in the configuration telegram.

Table 29: Identifier bytes – configuration identifier in the general identifier format (Header byte)

Byte	Information							
	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
0			0	0				

(Header byte)

Length of the manufacturer-specific data
0000_B: No manufacturer-specific data
0001_B
... Length of the manufacturer-specific data in bytes
1110_B
1111_B: No manufacturer-specific data follows

00_B: Special identifier format

Input and output
00_B: Empty location (no input or output available)
01_B: A length byte follows for inputs
10_B: A length byte follows for outputs
11_B: A length byte follows for inputs and outputs

Table 30: Identifier bytes – configuration identifier in the special identifier format (length byte)

Byte	Information							
	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
1/2								Length byte(s)

Data length
0000_B: 1 Byte/Word
0001_B: 2 Bytes/Words
...
1111_B: 16 Bytes/Words

Organization
0_B: Byte
1_B: Word

Consistency
0_B: By byte/word
1_B: Over the total length

Since the adoption of the DP/V1 specification, it is possible to add data type information to the process data that is described via the special identifier byte. This is done using the manufacturer specific data.

The data type coding in the following bytes is defined as follows:

Table 31: Identifier bytes – configuration identifier in the special identifier format (datatype byte)

Byte	Information							
	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
3/4								
…								
16/17								

Datatype byte(s)

1_D:	Boolean
2_D:	Integer8
3_D:	Integer16
4_D:	Integer32
5_D:	Unsigned8
6_D:	Unsigned16
7_D:	Unsigned32
8_D:	Float32
9_D:	VisibleString
10_D:	OctetString
11_D:	
…	see PI-Guideline 3512 V1.0 September 2006
31_D:	
32_D:	ArrayOfBoolean
33_D:	ArrayOfInteger8
34_D:	ArrayOfInteger16
35_D:	ArrayOfInteger32
36_D:	ArrayOfUnsigned8
37_D:	ArrayOfUnsigned16
38_D:	ArrayOfUnsigned32
39_D:	ArrayOfFloat32
40_D:	
…	see PI-Guideline 3512 V1.0 September 2006
79_D:	
80_D:	ArrayOfBoolean
81_D:	ArrayOfInteger8
82_D:	ArrayOfInteger16
83_D:	ArrayOfInteger32
84_D:	ArrayOfUnsigned8
85_D:	ArrayOfUnsigned16
86_D:	ArrayOfUnsigned32
87_D:	ArrayOfFloat32
88_D:	
…	see PI-Guideline 3512 V1.0 September 2006
109_D:	
110_D:	F message trailer with 4 octets
111_D:	F message trailer with 5 octets
112_D:	F message trailer with 6 octets
113_D:	
…	see PI-Guideline 3512 V1.0 September 2006
255_D:	

This identifier bytes are saved in the GSD file. When planning, the corresponding I/O module is selected by the article number in the hardware catalog of the configuration software.

To simplify the process, available configuration modules are combined in groups in the following table.

Table 32: Table Modules

Module	Description	Example
Module	Identifier byte according to the general identifier format for digital input or output I/O modules: One or two bytes are allocated in the respective process image. The information of the digital inputs and/or outputs of the respective I/O module are mapped to the least significant bits.	75x-400 2 DI/24 V DC/3.0 ms
	Identifier byte according to the general identifier format for analog input or output I/O modules: Only the user data required for operating the I/O module are mapped in the respective process image area (input process image and/or output process image).	75x-461 2 AI/RTD 75x-550 2 AO/0-10 V
*-Module	Identifier byte according to the special identifier format for digital input or output I/O modules: A byte previously allocated with “module” that is not completely occupied with digital information subsequent to configured “*-modules” is populated with the information of the digital inputs and/or outputs for the respective I/O module . A requirement is that all information of the respective I/O module can be accommodated in the byte that's already allocated.	*75x-400 2 DI/24 V DC/3.0 ms
RA module	Identifier byte according to the special identifier format for complex modules, particularly for analog inputs and outputs: Input and output information including control and status byte are mapped in the respective process image area. This way, the register structure of the respective I/O modules can be accessed when parameterization is done via cyclic process data exchange.	75x-461 2 AI/RTD RA 75x-550 2 AO/0-10 V RA

The arrangement and meaning of the module information in the process images depends on the following settings:

- Process of the configuration check on the part of the station proxy
  Parameter Station proxy: "Start-up if expected and actual configuration differ"
  Setting options: "disabled", "enabled"

- Physical existence of a configured I/O module
  Parameter Module slot: "I/O module is physical"
  Setting options: "plugged in", "(optional1) not plugged"

  - In the case of setting "(optionally) not plugged", the "Available I/O module" plays a role
    Cases: "Configured I/O module", "Reserve module"

- Depiction of diagnostics information in the process image
  Parameter Module slot: "Map diagnostics in input PAB"
  Setting options: "disable", "enable"

[1)] Applies to activating "Start-up if expected and actual configuration differ"

For reasons of clarity, the following combinations are defined for the first three settings:

Table 33: Parameters – Settings

Parameter / Settings	Start-up for preset configuration unlike actual configuration	I/O module is physical	Available I/O module
PK1	not relevant	plugged in	Configured I/O module
PK2	disabled	not plugged	No I/O module
PK3	enabled	optional not plugged	Configured I/O module
PK4	enabled	optional not plugged	Reserve module
PK5	not relevant	plugged in	Configured I/O module
PK6	disabled	not plugged	No I/O module
PK7	enabled	optional not plugged	Configured I/O module
PK8	enabled	optional not plugged	Reserve module

Note

More information about the identifier bytes
A description of the identifier bytes for the fieldbus coupler and I/O modules can be found in the "Identifier Bytes" chapter in the appendix.

8.4 PI Configuration

8.4.1 Application Example

The physical configuration of the node is determined by:
- The configuration of the planned I/O modules with the DP fieldbus coupler,
- The slot properties in the respective module parameters and
- The “Startup if expected and actual configuration differ” parameter set as part of the station parameterization.

The following application examples show the configuration of the node based on the parameter selected during the station parameterization.

Table 34: Planned station configuration

Slot			I/O module	Channel	DP module DP identification	Slot properties		DP master	
Pro-jec-ted	physical					Module is physi-cally	Diagnostics is mapped into the Input-PI	I-PI	O-PI
	(set-point ≠ actual)	!(set-point ≠ actual)							
1	1	1	750-333	-	750-333 No process data channel	-	-	-	-
2	2	2	75x-1405	0	75x-1405 16DI/24V DC [0x11]	Plug fitted	-	I 12.0	-
				1				I 12.1	-
				2				I 12.2	-
				…				…	…
				14				I 13.6	-
				15				I 13.7	-
3	3	3	75x-430	0	75x-430 8DI/24V DC/3.0ms [0x10]	Plug fitted	-	I 14.0	-
				1				I 14.1	-
				2				I 14.2	-
				…				…	…
				6				I 14.6	-
				7				I 14.7	-
4	4	4	75x-457	0	75x-457 4AI/+/-10V/SE [0x53]	Plug fitted	-	IW 16	-
				1				IW 18	-
				2				IW 20	-
				3				IW 22	-
5	5	5	75x-402	0	75x-402 4DI/24V DC/3.0ms [0x10]	Plug fitted	-	I 15.0	-
				1				I 15.1	-
				2				I 15.2	-
				3				I 15.3	-
6	6	-	75x-461	0	75x-461 2AI/RTD [0x51]	(optional) not plug fitted	-	IW 24	-
				1				IW 26	-
7	7	-	75x-425	0	*75x-425 2DI/24V DC/NAMUR [0x00]	(optional) not plug fitted	released	I 15.4	-
				1				I 15.5	-
				DIA 0				I 15.6	-
				DIA 1				I 15.7	-
8	8	6	75x-610	-	750-610 P-Einsp. 24V DC/DIA [0x00]	fitted	-	-	-
9	9	7	75x-1504	0	75x-1504 16DO/24V DC/0.5A [0x21]	fitted	-	-	Q 8.0
				1				-	Q 8.1
				2				-	Q 8.1
				…				…	…
				14				-	Q 9.6
				15				-	Q 9.7

Table 34: Planned station configuration

Slot			I/O module	Channel	DP module DP identification	Slot properties		DP master	
Pro-jected	physical					Module is physi-cally	Diagnostics is mapped into the Input-PI	I-PI	O-PI
	(set-point ≠ actual)	!(set-point ≠ actual)							
10	10	8	75x-537	0 / DIA 0	75x-537 8DO/8DIA-DI/DIA [0x30]	plugged	enabled	E 10.0	A 10.0
				1 / DIA 1				E 10.1	A 10.1
				2 / DIA 2				E 10.2	A 10.2
				…				…	…
				6 / DIA 6				E 10.6	A 10.6
				7 / DIA 7				E 10.7	A 10.7
11	11	-	75x-532	0	75x-532 4DO/24V DC/0.5A/DIA [0x20]	(optional) not plugged	disabled	-	A 11.0
				1				-	A 11.1
				2				-	A 11.2
				3				-	A 11.3
12	12	9	75x-557	0	75x-557 4AO/+/-10V [0x63]	fitted	-	-	AW 12
				1				-	AW 14
				2				-	AW 16
				3				-	AW 18
13	13	-	75x-472	0	75x-472 2AI/0-20mA/OVLP [0x51]	(optional) not plug fitted	-	EW 28	-
				1				EW 30	-
14	14	10	75x-511	0	75x-511 2DO/24V DC/PWM [0xF2]	fitted	-	EB 32	AB 22
								EB 33	AB 23
								EB 34	AB 24
				1				EB 35	AB 25
								EB 36	AB 26
								EB 37	AB 27
15	15	11	75x-630	0	75x-630 SSI-Interface RA [0xF2]	fitted	-	EB 38	AB 28
								…	…
								EB 43	AB 33
16	16	12	75x-508	0	*75x-508 2DO/24V DC/2.0A/DIA [0x00]	fitted	Locked	-	A 11.4
				1				-	A 11.5
17	17 / -	-	75x-637	0	75x-637 Encoder-Interface [0xF2]	(optional) not plug fitted	-	EB 44	AB 34
								…	…
								EB 49	AB 39

8.4.1.1 Physical station design with deactivated parameter “Startup if expected and actual configuration differ”

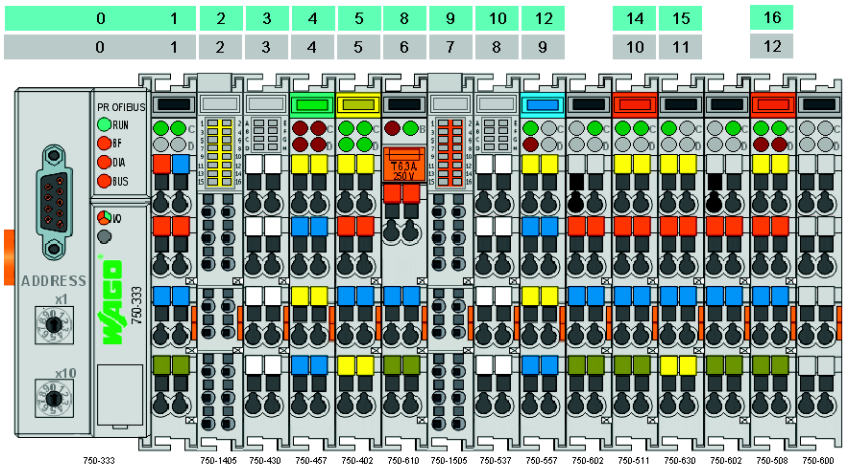

Figure 39: Physical station design with deactivated parameter “Startup if expected and actual configuration differ” (sample)

If the parameter “Startup when expected/actual configuration differ” is deactivated for the fieldbus coupler in the role as a station proxy, the parameter “I/O module is physical” on the part of the I/O modules receives the settings “plugged in” or “not plugged”.
To ensure the station powers up correctly, there cannot be any I/O modules configured as “not plugged” within the physical node.
Diagnostics of existing I/O modules are reported by their configured slot.
The numbers in gray above the node represent the physical DP I/O module slot.
The configured slots are in light blue.
Passive I/O modules – in this case, the 750-602 Supply Module and the 750-600 End Module – that provide no information on the PROFIBUS, are not considered for the slot assignment.

8.4.1.2 Physical station design with activated parameter “Startup if expected and actual configuration differ” 1

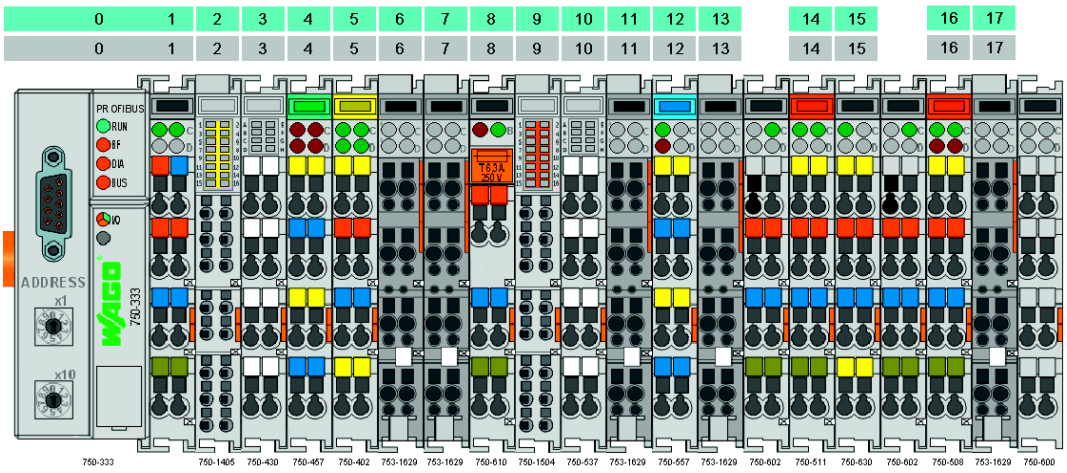

Figure 40: Physical station design with activated parameter “Startup if expected and actual configuration differ” 1 (sample)

If the parameter “Startup for preset configuration unlike actual configuration” is activated for the fieldbus coupler in the role as a station proxy, the parameter module slot “I/O module is physical” for the I/O modules receives the settings “plugged in” or “optional not plugged”. To ensure the station powers up correctly, there must be I/O modules configured as “optional not plugged” in the physical arrangement or be represented by a reserve module – in this case, 753-1629. Diagnostics of I/O modules that are not represented by a reserve module, or that must always be available, are reported by their configured slot.
The numbers in gray above the node represent the physical DP I/O module slot. The configured slots are in light blue.

8.4.1.3 Physical station design with activated parameter “Startup if expected and actual configuration differ” 2

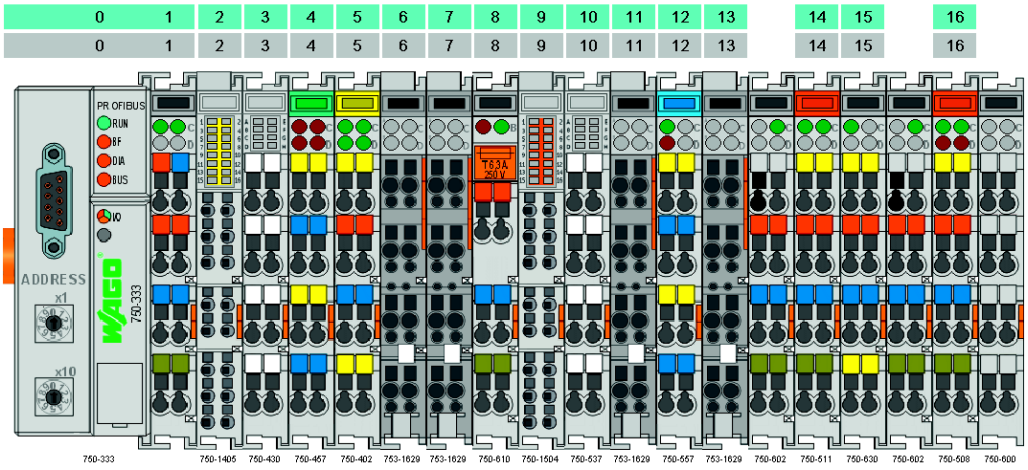

Figure 41: Physical station design with activated parameter “Startup if expected and actual configuration differ” 2 (sample)

If the parameter “Startup for preset configuration unlike actual configuration” is activated for the fieldbus coupler in the role as a station proxy, the parameter module slot “I/O module is physical” for the I/O modules receives the settings “plugged in” or “optional not plugged”. If I/O modules should have been configured as “optional not plugged” at the right end of the node and represented by an extra module, the physical arrangement of the extra modules – in this case on slot 17 – is optional.
The numbers in gray above the node represent the physical DP I/O module slot. The configured slots are in light blue.

Note

More information about the PI-configuration
An exact description of the PI-configuration for the fieldbus coupler and I/O modules can be found in the “PI-Configuration” chapter in the appendix.

8.5 Parameterization

Before data can be exchanged between the DP master and DP slave, parameterization is required in addition to the configuration.

The respective configuration tool of the DP master, e.g. SIMATIC HW Config, is used to set the extended user parameters (Extended User_Prm_Data) for the station proxy and the I/O modules based on the General Station Description (GSD file). The individual parameters are set via selectable textual descriptions.

8.5.1 Standard Parameterization

The standard parameterization includes information used to compare planned and installed I/O modules of a PROFIBUS station. Slot properties, diagnosis, substitute values and individual operational settings of the respective I/O module are optional. The scope of the standard parameterization has at least 3 bytes for digital I/O modules and complex I/O modules need at least 4 bytes of parameterization data. The following descriptions of the station and module parameters include the respective length of the standard parameter set.

8.5.2 Structured Parameterization

The structured parameterization allows the master to identify and process the parameters assigned to an I/O module throughout the station parameters. It contains structural information such as structure length, structure type and slot that precede the standard parameters of the fieldbus coupler as the station proxy and precede each planned I/O module. The scope of the parameterization data increases by 4 bytes each.

This type of parameterization is only required in conjunction with PROFIsafe modules. It is then only used if the F-Host application of a DPV1 master is available to the slave parameter set to evaluate the F parameters of a PROFIsafe device.

The descriptions of the station and module parameters include the respective length of the structured parameter set.

Note

More information about the parameters
An exact description of the parameters for the fieldbus coupler and I/O modules can be found in the “Parameters of the Fieldbus Coupler and I/O Modules” chapter in the appendix.

Note

GSD files
If structured parameterization of the 750-333 is required, use the GSD files 754_X3n.GSD.

8.5.3 Parameterization on demand

The DP/V0 parameter assignment message makes its specific parameter sets available before commencing cyclical active data exchange; this information is also provided to the fieldbus coupler and attached I/O modules.
The fieldbus coupler can have the role as a station proxy.

The user makes the settings based on the GSD file as part of planning and are made available to the station for each connection by the DP master. This ensures that each component is supplied with the configured parameter set before commencement of operations even in the event of a required exchange.

Based on the fact that the DP/V0 parameter assignment message can only have 244 bytes of information in total for the entire station (fieldbus coupler and up to 63 I/O modules), this type of parameterization is not well suited for very complex I/O modules.

With the approach of the parameterization on demand also referred to as iPar Server, the PROFIFUS and PROFINET user organization offers the opportunity to store complex parameter structures of I/O modules on the main controller during start-up, and if necessary, generally after replacement of a component to make it available again.

8.6 iPar Server

The iParameters are used to configure device functions of a safety device, for example the PROFIsafe I/O modules of the WAGO-I/O-SYSTEM 750/753. Based on current definitions, a manufacturer tool such as the WAGO parameterization tool “WAGO-Safety-Editor 75x” (short: SEDI) has to be used.

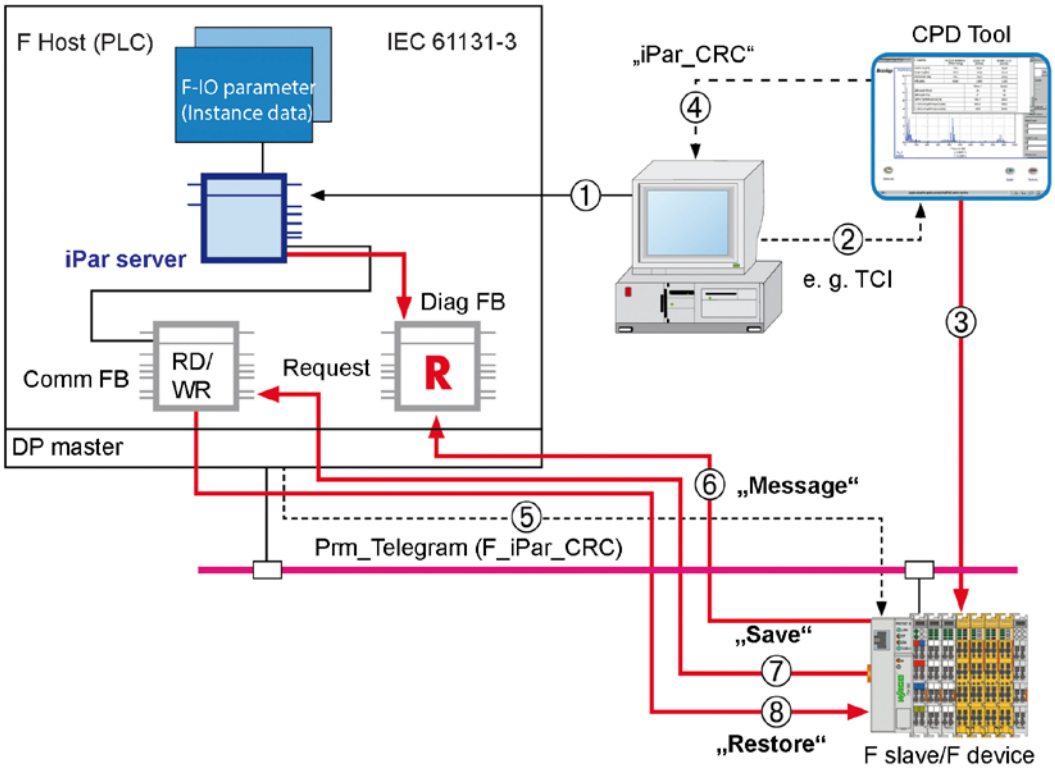

Figure 42: iPar server

Table 35: Legend for figure “iPar server”

No.	Meaning
1	Instantiation of the “iPar Server” function.
2	CDP Tool Start and parameter transfer (e.g., node address)
3	iParameterization and start-up, test and release
4	Transfer of iParameter backup (signature) to the host
5	During start-up, transfer of the signature to the F slave (Prm_Telegram)
6	Message to iPar server about diagnostic agent (alarm/status)
7	iPar server polls Diag FB and starts “Save” if required
8	iPar server polls Diag FB and starts “Restore” if required

It is often required during a repair to quickly replace a device without using additional manufacturer tools for parameterization of the device functions.

To meet this requirement, the iPar server is used that offers appropriate services for saving and restoring iParameters. The iPar server is available as a system function within the non-safety related part of the safe PLC.

Further details about using the iPar server in conjunction with the WAGO PROFIsafe I/O module are available in an application note.

Note

Use the application notes from WAGO!
An overview for using the PROFIsafe I/O module in combination with a safety PLC is summarized in an application note. This application note is available on the Internet at www.wago.com in the area “Service > Downloads > Application Notes...”.

9 Diagnostics

9.1 LED Signaling

For on-site diagnostics, the fieldbus coupler has several LEDs that indicate the operational status of the fieldbus coupler or the entire node (see following figure).

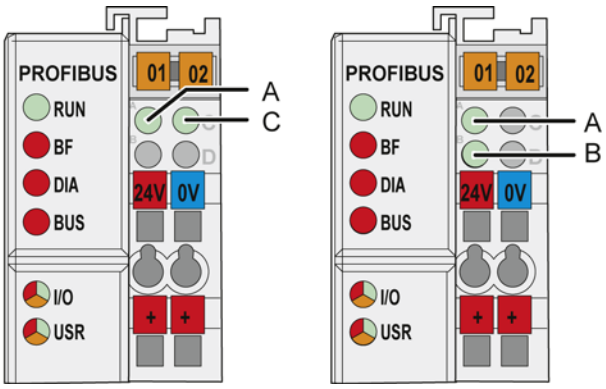

Figure 43: Display Elements (two manufacturing variations)

The diagnostics displays and their significance are explained in detail in the following section.

The LEDs are assigned in groups to the various diagnostics areas:

Table 36: LED Assignment for Diagnostics

Diagnostics area	LEDs
Fieldbus status	• RUN • BF • DIA • BUS
Node status	• I/O
Status Supply Voltage	• A (system supply) • B (field supply)

9.1.1 Evaluating Fieldbus Status

The operating mode for communication via PROFIBUS is signaled by the top LED group (“RUN”, “BF”, “DIA”, “BUS”).

Table 37: Diagnosis of fieldbus status – Explanation of LEDs

LED	Color	Explanation
RUN	green	indicates error-free and proper fieldbus initialization
BF	red	indicates active communication via PROFIBUS
DIA	red	indicates external diagnostics
BUS	red	indicates a parameterization or configuration error

Table 38: Diagnosis of fieldbus status – solution in event of error

RUN	BF	DIA	BUS	Explanation	Solution
Off	Off	Off	Off	No operating voltage to the coupler or a hardware fault is present.	Check the voltage supply to the fieldbus coupler. Replace the fieldbus coupler where required.
On	On	*	Off	PROFIBUS interface started; baud rate was not yet detected.	Check whether PROFIBUS is connected. Check to see whether the baud rate parameterized on the master is supported by the fieldbus coupler. Replace the fieldbus coupler, on account of a hardware fault.
On	Flashing	*	Off	Baud rate detected, station not yet parameterized and configured.	Check the configuration and the slave addresses. Check the slave addresses. Load the configuration and restart the fieldbus coupler by turning the power off and on again.
On	Flashing	On	Blink code	Slave has been parameterized or configured incorrectly.	Evaluate the blink code and correct the configuration accordingly.
On	Off	*	Off	The fieldbus coupler is in the process of exchanging data.	Error-free, productive exchange of data.
On	*	On	*	The fieldbus coupler is reporting a diagnostics process that is ready to run.	The data exchange is trouble free. Diagnostics information such as cable break on an analog input module is active.

* Irrelevant

9.1.2 Error Message via Blink Code of the BUS LED

Table 39: Error message via blink code of the BUS LED

Error argument	Error description	Remedy
Error code 1: Error in parameterization telegram		
1	Insufficient parameterization data. The GSD file is defective or the parameter data was entered improperly.	Contact WAGO Support.
2	Excessive parameterization data. The GSD file is defective or the parameter data was entered improperly.	Contact WAGO Support.
3	Parameterization data for the physical arrangement of the modules exceeds the maximum length of the parameterization telegram of 244 bytes.	Contact WAGO Support.
Error Code 2: Error in Parameterization Telegram		
n	Parameterization byte n faulty. The nth byte in the parameter telegram is faulty.	Contact WAGO Support.
Error code 3: Error in configuration telegram		
1	Insufficient configuration data.	Check the configuration; most likely, an I/O module has been inadvertently left out of the configuration. Load the configuration and restart the fieldbus coupler by turning the power off and on again.
2	Excessive configuration data.	Check the configuration; most likely, an I/O module has been configured but not connected. Load the configuration and restart the fieldbus coupler by turning the power off and on again.
Error Code 4: Error in Configuration Telegram		
n	Configuration byte (module) n faulty.	Check the nth module in the configurator. Load the configuration and restart the fieldbus coupler by turning the power off and on again.
Error Code 5: Faulty Data Length		
1	Maximum input data length exceeded (more than 128 bytes input data, more than 244 bytes starting from software version 03).	Switch off the power for the fieldbus coupler. Remove some of the modules from the node and switch on the power again.
2	Maximum output data length exceeded (more than 128 bytes output data, more than 244 bytes starting from software version 03).	Switch off the power for the fieldbus coupler. Remove some of the modules from the node and switch on the power again.
Error Code 6: Compilate Buffer Overflow		
1	Compilate buffer overflow for DP process image.	Contact WAGO Support.

9.1.3 Evaluating Node Status – I/O LED (Blink Code Table)

The communication status between fieldbus coupler/controller and the I/O modules is indicated by the I/O LED.

Table 40: Node Status Diagnostics – Solution in Event of Error

LED Status	Meaning	Solution
I/O		
green	The fieldbus node is operating correctly.	Normal operation.
orange flashing	Start of the firmware. 1 … 2 seconds of rapid flashing indicate start-up.	-
red	Coupler/controller hardware defect	Replace the fieldbus coupler/controller.
red flashing	Flashing with approx.. 10 Hz indicates the initialization of the internal bus or of a internal bus error.	Note the following flashing sequence.
red cyclical flashing	Up to three successive flashing sequences indicate internal data bus errors. There are short intervals between the sequences.	Evaluate the flashing sequences based on the following blink code table. The blinking indicates an error message comprised of an error code and error argument.
off	No data cycle on the internal bus.	The fieldbus coupler/controller supply is off.

Device boot-up occurs after turning on the power supply. The I/O LED flashes orange.

Then the bus is initialized. This is indicated by flashing red at 10 Hz for 1 … 2 seconds.

After a trouble-free initialization, the I/O LED is green.

In the event of an error, the I/O LED continues to blink red. Blink codes indicate detailed error messages. An error is indicated cyclically by up to 3 flashing sequences.

After elimination of the error, restart the node by turning the power supply of the device off and on again.

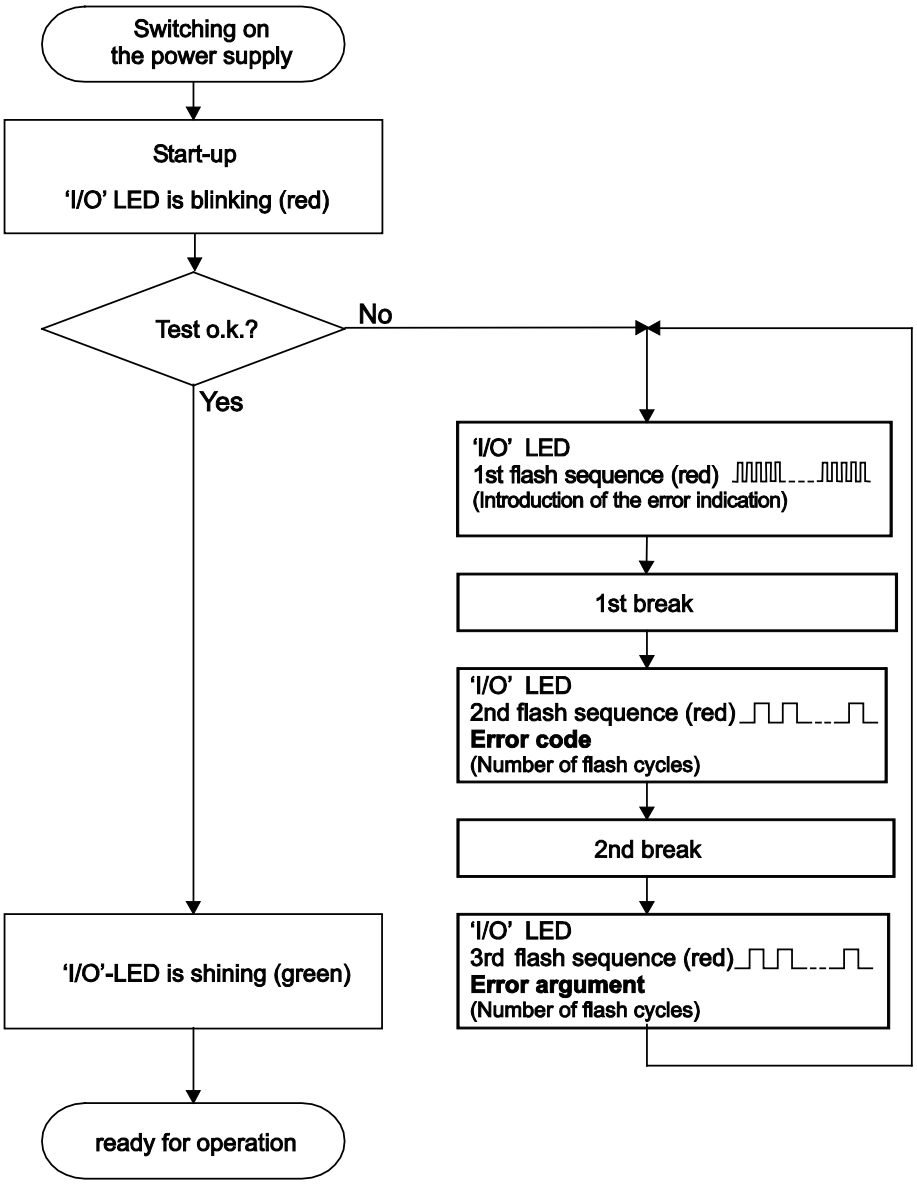

Figure 44: Node Status – I/O LED Signaling

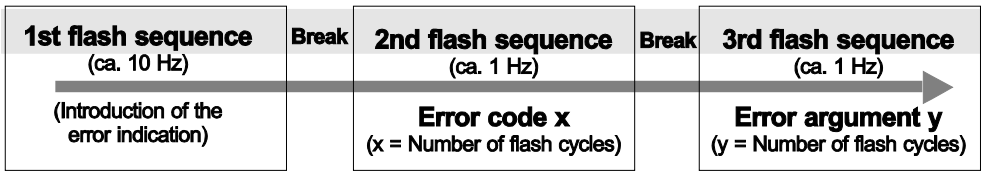

Figure 45: Error Message Coding

Example of a module error:

- The I/O LED starts the error display with the first flashing sequence (approx. 10 Hz).
- After the first break, the second flashing sequence starts (approx. 1 Hz): The I/O LED blinks four times.
  Error code 4 indicates “data error internal data bus”.

- After the second break, the third flashing sequence starts (approx. 1 Hz):
  The I/O LED blinks twelve times.
  Error argument 12 means that the internal data bus is interrupted behind the twelfth I/O module.

The thirteenth I/O module is either defective or has been pulled out of the assembly.

Table 41: Blink code- table for the I/O LED signaling, error code 1

Error code 1: "Hardware and configuration error"		
Error Argument	**Error Description**	**Solution**
-	Invalid check sum in the parameter area of the fieldbus controller.	1. Turn off the power supply for the node. 2. Replace the fieldbus controller. 3. Turn the power supply on again.
1	Overflow of the internal buffer memory for the attached I/O modules.	1. Turn off the power for the node. 2. Reduce the number of I/O modules. 3. Turn the power supply on again. 4. If the error persists, replace the fieldbus controller.
2	I/O module(s) with unknown data type	1. Determine the faulty I/O module by first turning off the power supply. 2. Plug the end module into the middle of the node. 3. Turn the power supply on again. 4. - LED continues to flash? - Turn off the power supply and plug the end module into the middle of the first half of the node (toward the fieldbus controller). - LED not flashing? - Turn off the power and plug the end module into the middle of the second half of the node (away from the fieldbus controller). 5. Turn the power supply on again. 6. Repeat the procedure described in step 4 while halving the step size until the faulty I/O module is detected. 7. Replace the faulty I/O module. 8. Inquire about a firmware update for the fieldbus controller.
3	Unknown module type of the Flash program memory	1. Turn off the power supply for the node. 2. Replace the fieldbus controller. 3. Turn the power supply on again.
4	Fault when writing in the Flash program memory.	1. Turn off the power supply for the node. 2. Replace the fieldbus controller. 3. Turn the power supply on again.
5	Fault when deleting the Flash memory.	1. Turn off the power supply for the node. 2. Replace the fieldbus controller. 3. Turn the power supply on again.
6	The I/O module configuration after AUTORESET differs from the configuration determined the last time the fieldbus controller was powered up.	1. Restart the fieldbus controller by turning the power supply off and on.
7	Fault when writing in the serial EEPROM.	1. Turn off the power supply for the node. 2. Replace the fieldbus controller. 3. Turn the power supply on again.

Table 41: Blink code- table for the I/O LED signaling, error code 1

Error code 1: “Hardware and configuration error”		
Error Argument	**Error Description**	**Solution**
8	Invalid hardware-firmware combination.	1. Turn off the power supply for the node. 2. Replace the fieldbus controller. 3. Turn the power supply on again.
9	Invalid check sum in the serial EEPROM.	1. Turn off the power supply for the node. 2. Replace the fieldbus controller. 3. Turn the power supply on again.
10	Serial EEPROM initialization error	1. Turn off the power supply for the node. 2. Replace the fieldbus controller. 3. Turn the power supply on again.
11	Fault when reading in the serial EEPROM.	1. Turn off the power supply for the node. 2. Replace the fieldbus controller. 3. Turn the power supply on again.
12	Timeout during access on the serial EEPROM	1. Turn off the power supply for the node. 2. Replace the fieldbus controller. 3. Turn the power supply on again.
14	Maximum number of gateway or mailbox modules exceeded	1. Turn off the power for the node. 2. Reduce the number of corresponding modules to a valid number. 3. Turn the power supply on again.

Table 42: Blink code table for the I/O LED signaling, error code 2

Error code 2: -not used-		
Error Argument	**Error Description**	**Solution**
-	Not used	-

Table 43: Blink code table for the I/O LED signaling, error code 3

Error code 3: “Protocol error, internal bus”		
Error Argument	**Error Description**	**Solution**
-	Internal data bus communication is faulty, defective module cannot be identified.	- Are passive power supply modules (750-613) located in the node? - 1. Check that these modules are supplied correctly with power. 2. Determine this by the state of the associated status LEDs. - Are all modules connected correctly or are there any 750-613 Modules in the node? - 1. Determine the faulty I/O module by turning off the power supply. 2. Plug the end module into the middle of the node. 3. Turn the power supply on again. 4. - LED continues to flash? - Turn off the power supply and plug the end module into the middle of the first half of the node (toward the fieldbus coupler). - LED not flashing? - Turn off the power and plug the end module into the middle of the second half of the node (away from the fieldbus coupler). 5. Turn the power supply on again. 6. Repeat the procedure described in step 4 while halving the step size until the faulty I/O module is detected. 7. Replace the faulty I/O module. 8. If there is only one I/O module on the fieldbus coupler and the LED is flashing, either the I/O module or fieldbus coupler is defective. Replace the I/O module with a pretested, properly functioning I/O module. If the LED no longer flashes, the replaced I/O module was faulty. Replace this I/O module. 9. If the LED continues to flash, the fieldbus coupler is faulty. Replace the fieldbus coupler.

Table 44: Blink code table for the I/O LED signaling, error code 4

Error code 4: “Physical error, internal bus”		
Error Argument	**Error Description**	**Solution**
-	Internal bus data transmission error or interruption of the internal data bus at the fieldbus coupler	1. Turn off the power supply to the node. 2. Plug the end module behind the fieldbus coupler. 3. Turn the power supply on. 4. Observe the error argument signaled. - Is no error argument indicated by the I/O LED? - 5. Replace the fieldbus coupler. - Is an error argument indicated by the I/O LED? - 5. Identify the faulty I/O module by turning off the power supply. 6. Plug the end module into the middle of the node. 7. Turn the power supply on again. 8. - LED continues to flash? - Turn off the power and plug the end module into the middle of the first half of the node (toward the fieldbus coupler). - LED not flashing? - Turn off the power and plug the end module into the middle of the second half of the node (away from the fieldbus coupler). 9. Turn the power supply on again. 10. Repeat the procedure described in step 6 while halving the step size until the faulty I/O module is detected. 11. Replace the faulty I/O module. 12. If there is only one I/O module on the fieldbus coupler and the LED is flashing, either the I/O module or fieldbus coupler is defective. Replace the I/O module with a pretested, properly functioning I/O module. If the LED no longer flashes, the replaced I/O module was faulty. Replace this I/O module. 13. If the LED continues to flash, the fieldbus coupler is faulty. Replace the fieldbus coupler.
n*	Interruption of the internal data bus behind the nth I/O module with process data	1. Turn off the power supply to the node. 2. Replace the (n+1) I/O module containing process data. 3. Turn the power supply on.

* The number of light pulses (n) indicates the position of the I/O module.
I/O modules without data are not counted (e.g., supply modules without diagnostics)

Table 45: Blink code table for the I/O LED signaling, error code 5

Error code 5: “Initialization error, internal bus”		
Error Argument	**Error Description**	**Solution**
n*	Error in register communication during internal bus initialization	1. Turn off the power supply to the node. 2. Replace the (n+1) I/O module containing process data. 3. Turn the power supply on.

* The number of light pulses (n) indicates the position of the I/O module.
I/O modules without data are not counted (e.g., supply modules without diagnostics)

Table 46: Blink code table for the 'I/O' LED signaling, error code 6

Error code 6: -not used-		
Error Argument	**Error Description**	**Solution**
-	Not used	

Table 47: Blink code table for the 'I/O' LED signaling, error code 7…8

Error code 7…8: -not used-		
Error Argument	**Error Description**	**Solution**
-	Not used	

Table 48: Blink code table for the I/O LED signaling, error code 9

Error code 9: "CPU Trap error"		
Error Argument	**Error Description**	**Solution**
1	Illegal Opcode	Fault in the program sequence. 1. Please contact the I/O Support.
2	Stack overflow	
3	Stack underflow	
4	NMI	

Table 49: Blink code table for I/O LED signaling, error code 10…11

Error code 10…11: -not used-		
Error argument	**Error description**	**Remedy**
-	not used	-

Table 50: Blink code table for I/O LED signaling, error code 12

Error code 12 "Initialization error, internal bus"		
Error Argument	**Error description**	**Remedy**
n*	Error with parameter communication during internal bus initialization	1. Switch off the power for the node. 2. Ensure that the nth module with process data is supplied with power at the field side. 3. Switch the power on.

* The number of light pulses (n) indicates the position of the I/O module.
I/O modules without data are not counted (e.g. supply modules without diagnostics)

9.1.4 Evaluating Power Supply Status

The power supply unit of the device has two green LEDs that indicate the status of the power supplies.
LED “A” indicates the 24 V supply of the coupler.
LED “B” or “C” reports the power available on the power jumper contacts for field side power.

Table 51: Power Supply Status Diagnostics – Solution in Event of Error

LED Status	Meaning	Solution
A		
Green	Operating voltage for the system is available.	-
Off	No power is available for the system	Check the power supply for the system (24 V and 0 V).
B or C		
Green	The operating voltage for power jumper contacts is available.	-
Off	No operating voltage is available for the power jumper contacts.	Check the power supply for the power jumper contacts (24 V and 0 V).

9.2 Error response

9.2.1 Fieldbus Failure

A fieldbus failure is indicated, for example, if the master is switched off or if the bus cable is interrupted. An error at the master can also result in a fieldbus failure.

A fieldbus failure is indicated by the red “BF” LED.

When the fieldbus fails, the fieldbus coupler can release the configurable substitute values of the I/O modules. A substitute value can be determined for each channel when configuring the inputs and outputs.

Table 52: Diagnosis of fieldbus failure

Substitute value strategy	value (bit-oriented) Digital Output Modules	value (byte-oriented) Analog Output Modules
Minimum value	0	0 or 4 mA, 0 V
Maximum value	1	20 mA, 10 V
Substitute value	0 or 1	0/4 ... 20 mA, -10 ... +10 V
Stop the internal bus	Response determine by the I/O module.	

The fieldbus coupler enters the values in the output process image. With I/O modules that have a byte- or word-oriented data width (e.g., pulse width module), the substitute value is determined using the value range.

As soon as the fieldbus is reactivated, the process data is transmitted again and the outputs of the node are set accordingly.

9.2.2 Internal Data Bus Failure

'I/O' LED indicates an internal bus failure.

'I/O' LED flashed red:
When an internal data bus failure occurs, the fieldbus coupler generates an error message (error code and error argument).
An internal data bus failure occurs, for example, if an I/O module is removed.
If the error occurs during operation, the output modules operate as they do during an internal data bus stop.
If the internal data bus error is resolved, the coupler starts up after turning the power off and on similar to that of a normal start-up. The process data is transmitted again and the outputs of the node are set accordingly.

9.3 Device Diagnostics

Device diagnostics of the fieldbus coupler includes max. 128 bytes (firmware version 14 or higher) and is made up of several diagnostic structures. In addition to the 6-byte standard diagnostics, the 7-byte including device status is always contained in the diagnostics frame.
The following diagnostics objects are optional:

- Identifier-related diagnostics
  (2 - 9 byte length depending on the parameterization of the station proxy and if necessary, by the number of configured I/O modules)

- Module status
  (5 - 20 byte length depending on the parameterization of the station proxy and if necessary, by the number of configured I/O modules)

- Channel-specific diagnostics
  (3 bytes per message, up to 38 messages depending on the parameterization of the station proxy and by the number of configured I/O modules)

- Status messages
  (8 bytes per message, up to 14 messages depending on the parameterization of the station proxy and by the corresponding I/O modules, as well as the number of channel-specific diagnostics present)

- iPar server notification
  (temporary 20 byte length, for I/O modules with iPar client functionality only, e.g. exclusively available for the F I/O modules 75x-661/000-003, 75x- 662/000-003, 75x-666/000-003 and 75x-667/000-003 with corresponding configuration or parameterization.)

Table 53: Diagnostics

	Designation	Length in the diagnostics frame	Additional information
PROFIBUS DP standard diagnostics	Station status 1	1 Byte	See EN 61158
	Station status 2	1 Byte	See EN 61158
	Station status 3	1 Byte	See EN 61158
	DP master address	1 Byte	Station address of the parameterization master.
	Manufacturer ID	2 Byte	ID number of the device assigned by the PNO.
PROFIBUS DP-extended diagnostic structures	Identifier-related diagnostics	2 – 9 Byte	Existence and length parameterizable in the diagnostic buffer.
	Device status	7 Byte	Always available in the diagnostic buffer.
	Module status	5 – 20 Byte	Existence and length parameterizable in the diagnostic buffer.
	Channel-specific diagnostics	each 3 Byte	Exist when the corresponding event occurs and the message was sent as part of the parameterization.
	Status messages	each 8 Byte	Exist when the corresponding event occurs and the message was sent as part of the parameterization.
	iPar server notification	20 Byte	Temporarily available in the diagnostic buffer when using individually parameterizable modules.

9.3.1 Station status 1 to 3

see IEC 61158

9.3.2 PROFIBUS DP Master Address

The byte contains the station address of the class 1 master that parameterized and configured the fieldbus coupler, and thus has read and written access to the process data in the station.

Table 54: PROFIBUS DP Master Address

Byte 3									0 … 125

9.3.3 Manufacturer ID

The manufacturer identification is located in byte 4 and 5 and contains a 16 bit code, intended for the identification of the device or the device class.

Byte 4	1	0	1	1	0	1	1	1
Byte 5	0	1	0	1	0	1	0	0

0xB754

9.3.4 Identifier-related diagnostics

The ID-based diagnostics is located in byte 6 and the bytes that follow depend on the length of the identifier-related diagnostics (LKD). The length depends on the number of I/O modules connected to the fieldbus coupler and includes 2 to 9 bytes. Up to 63 I/O modules can be connected to the fieldbus coupler in the role as a station proxy.

The identifier-related diagnostics consists of a header and bit array that provides the current status for each configured component.
A 0 indicates no error and a 1 indicates at least one pending error of the component or its signal channels. The bits are arranged by slot. Bit 1 is always assigned to the fieldbus coupler followed by the I/O modules in ascending order of their slots.

Table 55: Identifier-related diagnostics – structure

Byte-offset	Information								Meaning
	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	
0	**0**	**1**							**Header byte**
	Identifier-related diagnostics		Length of the identifier-related diagnostics incl. header (2-9 byte)						
1									**Diagnostics slot 1-8**
									Diagnostics 0B: not available 1B: available
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**Slot**
2									**Diagnostics slot 9-16**
	16	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**Slot**
…	…								
8									**Status module 61-64**
	64	**63**	**62**	**61**	**60**	**59**	**58**	**57**	**Slot**

The table below provides an example of a fieldbus coupler with 20 connected I/O modules. The number of the bytes is based on the diagnostic telegram (see table “Diagnostics”). There is diagnostic capability for the I/O modules on the 2nd, 3rd and 20th slot:

Table 56: Identifier-related diagnostics – sample

Byte	Information								Meaning
	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	
6	0	1	0	0	0	1	0	0	Header byte (9-byte module-related diagnostics incl. header)
7	0	0	0	0	1	1	0	0	Module diagnostics assignment: FBC fieldbus coupler IO I/O modules
8	0	0	0	0	0	0	0	0	
9	-	-	-	1	0	0	0	0	

Note

Interruption of the internal data bus

From firmware version 14 or higher, all slots of the identifier-related diagnostics with the exception of slot 1 (process data channel of the bus coupler) are set to error (1) when there is an interruption to the I/O module.

9.3.5 Device Status

The device status includes the required Overhead 7 byte and transmits device information about the internal status, internal data bus status or PROFIBUS DP status to the master or superior controller as required.

Table 57: Device status

Byte-offset	Information								Meaning
	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	
0	0	0							**Header byte**
	Alarm or status		Length of the module status incl. header (5-20 bytes)						
1	1	0	1	0	0	0	0	0	**Message type**
	Status	Status type = 32 (device status)							
2	0	0	0	0	0	0	0	0	**Slot**
	Slot of the station proxy (0)								
3	0	0	0	0	0	0	0	0	**Status specification**
							Status differentiation = 00_B (none)		
4									**Device status message**
	Device status source 00B: Internal status 01B: Internal data bus status 10B: PROFIBUS DP status 11B: reserved		Device status value						
5									**Device status argument**
6									**Extended device status argument**

9.3.5.1 Internal status messages and arguments

Table 58: Internal status messages and arguments

Device status		Description
Message	Argument	
0x00	0x00	No fault
0x01	0x00	EEPROM checksum error / checksum error in parameter range of FLASH memory
0x01	0x01	Overflow of inline code buffer
0x01	0x02	Unknown data type
0x01	0x03	Module type for flash program memory could not be determined / is incorrect
0x01	0x04	Fault when writing into the FLASH memory
0x01	0x05	Fault when deleting the FLASH memory
0x01	0x06	Changed I/O modules configuration determined after AUTORESET
0x01	0x07	Fault when writing into the serial EEPROM.
0x01	0x08	Invalid firmware
0x02	0x00	Incorrect table entry
0x07	N	Module at position n (n = 1...63) is not supported

9.3.5.2 Internal data bus messages and arguments

Table 59: Internal data bus messages and arguments

Device status		Description
Message	Argument	
0x43	0xFF	At least one module cannot interpret an internal bus command
0x44	0x00	A data fault or an internal data bus interruption exists after the controller
0x44	n	There is an internal data bus interruption after module n
0x45	n	Fault during register communication with module n

9.3.5.3 PROFIBUS DP status messages and arguments

Table 60: PROFIBUS-DP status messages and arguments

Device status		Description
Message	Argument	
0x81	0x01	Insufficient parameter data
0x81	0x02	Excessive parameter data
0x82	n	nth parameter byte faulty
0x83	0x01	Insufficient configuration data
0x83	0x02	Excessive configuration data
0x84	n	nth configuration byte (module) faulty
0x85	0x01	Maximum input data length exceeded
0x85	0x02	Maximum output data length exceeded
0x86	0x01	Overflow of the compilation buffer for the DP process map

9.3.6 Module status

The module status returns the status of the configured I/O modules on the respective slot. The bus coupler can be populated with up to 63 modules, so that

the module status can extend over the **l**ength of the **m**odule **s**tatus (**LMS**, 5-20 bytes) from byte (**LKD**+5+7) to byte (**LKD**+5+7+**LMS**) including header depending on the parameterization of the station proxy.

The module status is structured as follows:

Table 61: Module status

Byte-offset	Information								Meaning
	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	
0	0	0							**Header byte**
	Alarm or status		Length of the module status incl. header (5-20 bytes)						
1	1	0	0	0	0	0	1	0	**Message type**
	Status	Status type = 2 (device status)							
2	0	0	0	0	0	0	0	0	**Slot**
	Slot of the station proxy (0)								
3	0	0	0	0	0	0	0	0	**Status specification**
							Status differentiation = 00B (none)		
4									**Status module 1-4**
									00B: Data valid 01B: Data invalid 10B: Incorrect I/O module 11B: No I/O module
	4		3		2		1		**Slot**
5									**Status module 5-8**
	8		7		6		5		**Slot**
20									**Status module 61-64**
	64		63		62		61		**Slot**

Note

Interruption of the I/O module
All slots of the module status with the exception of slot 1 (process data channel of the bus coupler) are set to I/O module (3) when there is an interruption to the I/O module.

9.3.7 Channel-specific diagnostics

The channel-specific diagnostics detail the identifier-related diagnostics or module status.

For each faulty slot, one structure is added to the diagnostics frame per diagnosis. This consists of:

- A header byte,
- A byte that provides the channel type and number
- A byte the contains the error number and channel organization.

Table 62: Channel-specific diagnostics

Byte-offset	Information								Meaning
	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	
0	1	0							**Header byte**
	Channel-specific diagnostics		Slot (2-64)						
1									**Signal channel properties**
	Type of signal: 00B: not specified 01B: Input 10B: Output 11B: Input/output		Signal channel (0-15)						
2	0	0	0	0	0	0	0	0	**Signal channel properties**
	Slot of the station proxy (0)								
3	0	0	0	0	0	0	0	0	**Status specification**
	Type of channel: 000B: no assignment 001B: 1 Bit 010B: 2 Bit 011B: 4 Bit 100B: 1 Byte 101B: 1 Word 110B: 2 Words 111B: reserved		Error number						

9.3.7.1 Error Types of I/O Modules with Diagnostics Capability

The error numbers 0 to 9 refer to standardized error desriptions. The WAGO specific error are arranged from error number 17 and up.

Table 63: Error types of I/O modules with diagnostics capability

Error number		Meaning
STANDARDIZED	0	Not specified
	1	Short circuit
	2	Low voltage
	3	Overvoltage
	4	Overload
	5	Overtemperature
	6	Line break
	7	Upper limit value exceeded
	8	Lower limit value exceeded
	9	Error
	10 ... 15	Reserved
WAGO SPECIFIC	16	Reserved
	17	Field voltage fault
	18	Fuse fault
	19	Reserved
	20	Reserved
	21	Reserved
	22	Sampling error
	23	Warning
	24	The register of the I/O module, which is referenced by the type of signal and the signal channel, contains a diagnostics message
	25	Failsafe tripping
	26	External error
	27	Short circuit acc. to VCC
	28	Short circuit acc. to GND
	29	Bus error
	30	Discrepancy time exceeded
	31	Module fault

9.3.7.2 I/O Module Fault Cases

Table 64: I/O module fault cases

Item number	Type of channel	Error type	Meaning
75x-418, 75x-419, 75x-425, 75x-507, 75x-508, 75x-522, 750-523, 75x-532, 75x-537	'001	1.1010'	External fault (broken wire, overload or short circuit, manual operation)
75x-506	'001	0.0001' 0.0010' 0.0110' 0.1001'	Short circuit Low voltage Line break Error
75x-460, 75x-461, 75x-481, 75x-469, 75x-487	'101	0.0110' 0.1000' 1.1111'	Line break Value has fallen below lower limit value Module fault
75x-450, 75x-451, 75x-464	'101	0.0001' 0.0110' 1.1111'	Short circuit Line break Module fault
75x-450, 75x-451, 75x-453, 75x-454, 75x-455, 75x-456, 75x-457, 75x-459, 75x-462, 75x-466, 75x-474, 75x-476, 75x-478, 75x-479, 75x-480, 75x-482, 75x-483, 75x-484, 75x-485, 75x-492, 75x-493	'101	0.0111' 0.1000' 1.1111'	Upper limit value exceeded Value has fallen below lower limit value Module fault
75x-491	'101	0.0011' 0.0111' 1.1111'	Overvoltage Upper limit value exceeded Module fault
75x-494, 75x-495	'000	0.1001'	Error
75x-553, 75x-555, 75x-557, 75x-559, 75x-560	'101	0.1001'	Fault (short circuit, I/O module fault)
75x-562	'101	0.0010' 0.0100' 0.0101' 0.0111' 0.1000' 1.1010' 1.1111'	Low voltage Overload Overtemperature Upper limit value exceeded Value has fallen below lower limit value External fault (short circuit, I/O module fault) Module fault
75x-563	'101	0.0010' 0.0101' 0.0111' 0.1000' 1.0001' 1.1010' 1.1111'	Low voltage Overtemperature Upper limit value exceeded Value has fallen below lower limit value Field voltage fault External fault (short circuit, I/O module fault) Module fault
750-606	'001	1.0001' 0.0010' 1.1010'	Field voltage fault Low voltage External error

Table 64: I/O module fault cases

Item number	Type of channel	Error type	Meaning
750-610, 750-611	'001	1.0001' 1.0010'	Field voltage fault Fuse fault
75x-630	'110	0.1001' 1.0110' 1.1010' 1.1111'	Error Sampling error External fault (input fault) Module fault
75x-633 75x-635	'110	0.1001' 1.1111'	Error Module fault
75x-637	'000	0.1001' 1.1111'	Error Module fault
75x-639	'110	0.1001' 0.0111' 0.1000'	Error Upper limit value exceeded Value has fallen below lower limit value
75x-641	'000	0.1001' 1.0110' 1.1101'	Error Sampling fault (frame error) Bus error
75x-643	'000	0.1001' 1.0001'	Error Field voltage fault
75x-645	'000	0.1001' 1.1010'	Error External error
75x-642, 75x-650, 75x-651, 75x-652 75x-653	'110 ('000)	0.0111' 1.1111'	Upper limit value exceeded (reception buffer overflow) Module fault
75x-655	'000	1.0001' 0.1001' 1.1101'	Field voltage fault Error Bus error (AS interface flags offer more information)
75x-657	'000	0.0001' 0.0010' 0.0110' 0.1001' 1.0001'	Short circuit Low voltage Line break Error Warning
750-660/000-001, 753-661/000-002, 753-662/000-002, 750-665/000-001, 753-667/000-002	'001 ('000)	1.1000' 1.1111'	The register of the I/O module, which is referenced by the type of signal and the signal channel, contains a diagnostics message. Details are available in the I/O module documentation. Module fault

9.3.8 Status Messages

The fieldbus coupler provides the status message diagnostic object in the event that complex I/O modules can check their parameterization data independently or if complex I/O modules are capable of providing extended diagnostic information. In addition, all messages in conjunction with the iPar server are encoded in the form of a status message.

A status message is structured as follows:

Table 65: Status messages

Byte-offset	Information								Meaning
	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	
0	0	0	0	0	1	0	0	0	**Header byte**
	Alarm or status		Length of the status message incl. header						
1	1	0	0	0	0	0	0	1	**Message type**
	Sta-tus	Status type = 1 (status message)							
2									**Slot**
	Slot of the reporting I/O module (value range 2 - 64)								
3	0	0	0	0	0	0	0	0	**Status specification**
							Status differentiation = 00_B (none)		
4									**Value (LB)**
	Error or status value (LB), due to compatibility, available for earlier firmware versions								
5									**Channel information**
	Type of channel: 00B: Input 01B: Output 10B: Module 11B: reserved		Channel number (value range 0 - 63)						
4									**Value (HB)**
5	Error or status value (HB)								
4									**Value (LB)**
5	Error or status value (LB)								

9.3.8.1 PROFIsafe Parameterization Fault

Table 66: PROFIsafe parameterization fault

PROFIsafe parameterization fault		
Item number	**Fault number**	**Meaning**
750-660/000-001 750-665/000-001 753-662/000-002 753-667/000-002 75x-661/000-003 75x-662/000-003 75x-666/000-003 75x-667/000-003	64dez (0x0040)	Differing F_Dest_Add
	65dez (0x0041)	Invalid F_Dest_Add
	66dez (0x0042)	Invalid F_Source_Add
	67dez (0x0043)	Invalid F_WD_Time
	68dez (0x0044)	Not supported F_SIL
	69dez (0x0045)	Incorrect F_CRC_Length
	70dez (0x0046)	Incorrect F_Par_Version
	71dez (0x0047)	Invalid F_CRC1
75x-661/000-003 75x-662/000-003 75x-666/000-003 75x-667/000-003	73dez (0x0049)	Error when uploading the iParam.
	74dez (0x004A)	Error when downloading the iParam.
	75dez (0x004B)	Invalid iParam. from iPar server
	76dez (0x004C)	Not supported F_Block_ID

See PROFIsafe manuals or the GSD file for more information about the error messages.

9.3.8.2 WAGO-specific error messages

Table 67: WAGO-specific error messages

PROFIsafe Parameterization Fault		
Item number	**Fault number**	**Meaning**
75x-464, 75x-482, 75x-484, 75x-562, 75x-563, 75x-644, 75x-652, 75x-655, 75x-657, 75x-670, 75x-671, 75x-672, 75x-673	16dez (0x0010)	Parameterization fault
75x-657	98dez (0x0062)	Segmentation faulty
	101dez (0x0065)	Mailbox length Port 1 invalid
	104dez (0x0068)	Mailbox length Port 2 invalid
	107dez (0x006B)	Mailbox length Port 3 invalid
	110dez (0x006E)	Mailbox length Port 4 invalid
75x-661/000-003, 75x-662/000-003, 75x-666/000-003, 75x-667/000-003	257dez (0x0101)	Sequence error iParam. Upload
	259dez (0x0103)	Sequence error iParam. Download
75x-661/000-003, 75x-662/000-003, 75x-666/000-003, 75x-667/000-003	512dez (0x0200)	F-module has invalid i_Parameter
	513dez (0x0201)	Short circuit
	514dez (0x0202)	Low voltage
	515dez (0x0203)	Overvoltage PWR
	516dez (0x0204)	Overload
	517dez (0x0205)	Overtemperature
	518dez (0x0206)	Line break
	521dez (0x0209)	Internal fault
	523dez (0x020B)	Short circuit on T1
	524dez (0x020C)	Short circuit on T2
	528dez (0x0210)	Unsupported F-Prm length
	537dez (0x0219)	Safety-related shutdown
	539dez (0x021B)	Short circuit acc. to VCC
	540dez (0x021C)	Short circuit acc. to GND
	541dez (0x021D)	Wiring error
	542dez (0x021E)	Discrepancy time exceeded
	544dez (0x0220)	Low voltage PWR

See PROFIsafe manuals or the GSD file for more information about the error messages.

9.3.9 iPar server notification

Table 68: iPar server notification

Byte-offset	Information								Meaning
	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	
0	0	0	0	1	0	1	0	0	**Headerbyte**
	Alarm or status		Length of the iPar server notification incl. header (20 Byte)						
1	1	0	0	0	0	0	0	1	**Message type**
	Sta-tus	Status type = 7 (iPar server notification)							
2									**Slot**
	Slot of the reporting I/O module (value range 2 - 64)								
3	0	0	0	0	0	0	0	0	**Status specification**
							Status differentiation = 00_B (none)		
4	0	0	0	0	0	0	0	1	**Service Request Version**
	Version 1								
5	0	0	0	0	0	0	0	0	**Reserved**
	Preset with 0								
6	0	0	0	0					**Message Counter**
					Value range 1- 15 with overflow from 15 to 1				
7	0	0	0		0	0			**Service Request Typ**
	Reserved, present with 000B			Transmission mode 0B: Non-segmented transmission 1B: Segmented transmission	Reserved, preset with 00B		00B: Reserved 01B: Save (upload) 10B: reserved 11B: Restore (download)		
8	0	0	0	0	0	0	0	0	**Maximum segment size**
	Byte 3, Preset with 0								
9	0	0	0	0	0	0	0	0	**Maximum segment size**
	Byte 2, Preset with 0								
10	0	0	0	0	0	0	0	0	**Maximum segment size**
	Byte 1, Preset with 0								
11	0	0	0	0	0	0	0	0	**Maximum segment size**
	Byte 0, module dependent, identical to the entry in Byteoffset 19								
12	0	0	0	0	0	0	0	0	**Data block number for transmission of iParameters**
	Byte 3, unused, preset with 0								

Table 68: iPar server notification

Byte-offset	Information								Meaning
	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	
13	0	0	0	0	0	0	0	0	**Data block number for transmission of iParameters**
	Byte 2, unused, Preset with 0								
14	0	0	0	0	0	0	0	0	**Data block number for transmission of iParameters**
	Byte 1, unused, Preset with 0								
15	0	0	1	1	1	1	1	1	**Data block number for transmission of iParameters**
	Byte 0, Data block number 63								
16	0	0	0	0	0	0	0	0	**Overall length of the iParameter set**
	Byte 3, unused, Preset with 0								
17	0	0	0	0	0	0	0	0	**Overall length of the iParameter set**
	Byte 2, unused, Preset with 0								
18	0	0	0	0	0	0	0	0	**Overall length of the iParameter set**
	Byte 1, unused, Preset with 0								
19									**Overall length of the iParameter set**
	Byte 0, module dependent, see Byteoffset 11								

9.4 Acyclic Communication according to DP/V1

In addition to cyclic data communication (PROFIBUS DP standard in compliance with IEC 61158), PROFIBUS DP also offers acyclic communication services as an option. These acyclic services can be performed parallel to cyclic data transfer. In process engineering applications, the optional services allow industrial devices to be operated using PROFIBUS-DP. Standard field devices and devices that require these optional extensions can be operated on the same bus. The data blocks are addressed via the slot number and the data block number (index) of the module. The meaning of the slots and indices can be set according to the device specifications. This way, the user can either access the data or the parameter sets within a field device. To distinguish between a standard DP and an acyclic DP/V1 device, some keywords have been added to the GSD file.

Acyclic communication is no longer possible once cyclic data exchange has been interrupted. In the parameter assignment message, the Class 1 master activates the acyclic communication service of the device. In the Data_Exchange, the Class 1 Master that parameterized and configured a slave can use the acyclic service of the slave. Acyclic communication is no longer possible when exiting cyclic data communication.

For the extended services, a distinction is made between Master Class 1 / Slave Functions (MSAC1) and Master Class 2 / Slave Functions (MSAC2).

The use of an MSAC2 connection requires prior establishment (initiate) and subsequent suspension (abort) of the communication channel. Among other things, this action serves to monitor the MSAC2 connection. An MSAC1 connection is monitored by the always required MSCY0 connection.

The bus coupler supports the following acyclic services according to IEC61158-3:

Table 69: MSAC1 service

MSAC1 service	Requester	Responder
MSAC1_Read		**X**
MSAC1_Write		**X**

Table 70: MSAC2 service

MSAC2 service	Requester	Responder
MSAC2_Initiate		**X**
MSAC2_Abort	**X**	**X**
MSAC2_Read		**X**
MSAC2_Write		**X**

The MSAC1 services can be used when the DP/V1 operation has been activated in the parameter data and the cyclic MSCY0 connection is established. The MSAC1 connection is closed when the DP data exchange is left. In the event of cyclic or acyclic connection failures, both communication channels will be closed.

The MSAC2_Initiate service is used to open an acyclic MSAC2 connection. Once the connection has been established, it will be monitored by the C2 master. When failures occur, both the master and the slave can close the connection via MSAC2_Abort. The bus coupler is able to manage one MSAC2 connection.

9.4.1 Data Areas

Addressing the data areas, which can be written with MSAC1/2_Write or read with MSAC1/2_Read, is done via an index and the module number (Slot_Number) included in the configuration table. The modules begin at 0, i.e. the data areas of the bus coupler (basic device unit) can be accessed via slot number 0.

The value range of the index addressing is between 0 and 254. The existence of the individual data blocks (indices) depends on the module. The user data length of a MSAC1/2_Read and MSAC1/2_Write telegram cannot exceed 240 bytes. However, the actual lengths of the individual data areas depend on the modules (Index 255 CALL).

Note

Read and write access to index entries

All indices that concern register content of complex I/O modules are read only by default. Writing register data for purposes of the parameterization of the I/O module, e.g. the baud rate for the serial interfaces 750-650, 750-651 and 750-653 is only possible for modules with the order number extension 750-???/003-000. In this case, the user-specific registers R32 and R47 are enabled for write access with password. The write protection on registers R32 – R47 is removed by writing the value 0x1235 in register R31. Writing any other value to register R31 restores the write protection.

Acyclic writing of process data from e.g. digital or analog output modules is only possible with sole access via an MSAC2 connection. When establishing a MSAC1 connection, the output information from cyclic DP data exchange or the PFC runtime system is overwritten.

It is important to note that valid write requests in the register structure are also then confirmed if the write protection feature has not been enabled. In this case, the data to be written is not accepted by the complex I/O module. Acceptance only occurs when write protection is reset.

9.4.1.1 Fieldbus coupler, slots 0 and 1

Table 71: Fieldbus coupler, slots 0 and 1

Index	Meaning	Service primitives / Data length [Byte]
00_D ... 07_D	Reserved for expansions	
08_D	Configured module setup	MSAC1/2_Read / 2 … 65
09_D	Physical module setup	MSAC1/2_Read / 2 … 65
10_D ... 99_D	Reserved for expansions	
128_D	Reserved	
129_D	Reserved for expansions	
130_D	Fieldbus input image	MSAC1/2_Read / 1 ... 240
131_D	Fieldbus input image	MSAC1/2_Read / 1 ... (244 –240)
132_D	Fieldbus output image	MSAC1/2_Read / 1 ... 240 MSAC1/2_Write / 1 ... 240
133_D	Fieldbus output image	MSAC1/2_Read / 1 ... (244-240) MSAC1/2_Write / 1 ... (244-240)
134_D ... 139_D	Reserved	
140_D ... 253_D	Reserved for expansions	
254_D	Enabling of active data exchange [1)]	MSAC1/2_Write / 2 (0x55, 0xAA)

[1)] For setting “enabled” of the station proxy– parameter “Startup via DP/V1 channel”

9.4.1.2 Complex I/O Modules, Slots 1 - 63

Table 72: Complex I/O Modules, Slots 1 - 63

Index	Meaning
'xx00.0000'	Table register 0
...	...
'xx11.1010'	Table register 58
'xx11.1011'	All table registers
'xx11.1100'	Diagnostics data of the channel
'xx11.1101'	Input data of the channel
'xx11.1110'	Output data of the channel
'00xx.xxxx'	Table 0 / channel 0
'01xx.xxxx'	Table 1 / channel 1
'10xx.xxxx'	Table 2 / channel 2
'11xx.xxxx'	Table 3 / channel 3

9.4.1.3 Digital I/O Modules, Slots 1 - 63

Table 73: Digital I/O Modules, Slots 1 - 63

Index	Meaning
'xxx0.0000'	Channel 1
...	...
'xxx0.1111'	Channel 16
'000x.xxxx'	Diagnostics of the channel
'001x.xxxx'	Input information of the channel
'010x.xxxx'	Output information of the channel
'101x.xxxx' '1010.0000'	Input information of the module
'110x.xxxx' '1100.0000'	Output information of the module

The error message “invalid index” is returned when accessing data areas that are not available in the module.

Examples:

- Accessing indices of an I/O module that is not physically connected.
- Accessing the data areas of the third channel while using a 2-channel I/O module.
- Requesting the input data of an output module.
- Requesting the output data of an input module.
- Requesting of the diagnostics data of an I/O module that has no diagnostics information.

The error message “invalid slot“ is generated when addressing modules that are neither physically nor virtually (projected as not being plugged) available.

When reading from indices (MSAC1/2_Read), the length of information to be read can be set to the maximum PDF length of 240 bytes. The fieldbus coupler/controller returns the actual amount of information of the respective index.

When writing to indices (MSAC1/2_Write), the maximum possible length of information to be written to the respective index must not be exceeded. Otherwise, the fieldbus coupler/controller responds with the error message “invalid length when writing”.

Coding Error Messages

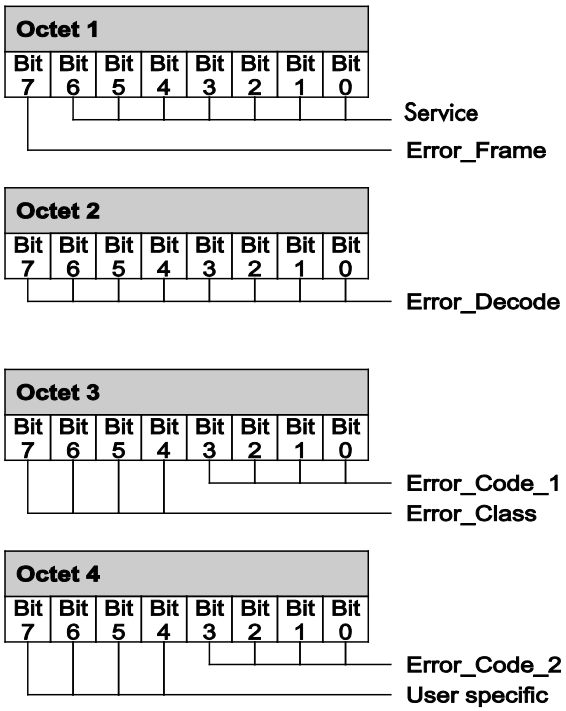

Figure 46: Coding Error Messages

Table 74: Meaning of the Octet 2 error messages

Octet 2			
Error Decode	**Meaning**		
0 ... 127	Reserved		
128*)	PROFIBUS DP/V1*)		
129 ... 254	Reserved		
255	PROFIBUS FMS		

*) Error codes returned by the bus coupler.

Table 75: Meaning of the Octet 3 error messages

Oktet 3			
Error_Class	**Meaning**	**Error_Code_1**	**Meaning**
0 - 9	Reserved		
10	Application errors	0	Read error
		1	Write error
		2	Module failure
		3 ... 7	Reserved
		8	Version conflict
		9	Feature not supported
		10 ... 15	User specific

Table 75: Meaning of the Octet 3 error messages

Oktet 3			
Error_Class	**Meaning**	**Error_Code_1**	**Meaning**
11*)	Access error*)	0*)	Invalid index
		1*)	Write length error
		2*)	Invalid slot
		3*)	Type conflict
		4	Invalid area
		5*)	State conflict
		6*)	Access denied
		7	Invalid range
		8	Invalid parameter
		9	Invalid type
		10 ... 15	User specific
12*)	Resource error*)	0	Read constrain conflict
		1	Write constrain conflict
		2*)	Resource busy
		3	Resource unavailable
		4 ... 7	Reserved
		8 ... 15	User specific
13 ... 15	User specific		

*) Error codes returned by the fieldbus coupler/controller.

Table 76: Meaning of the Octet 4 error messages

Octet 4			
Error_Class	**Meaning**	**Error_Code_2**	**Meaning**
0 ... 15	Reserved	0 ... 15	User specific

Note

Listing of all I/O modules with possible indices

A list of all I/O modules with possible indices is available in the “Acyclic Communication According to DP/V1” chapter in the appendix.

10 Fieldbus Communication

10.1 PROFIBUS

10.1.1 Description

PROFIBUS was developed as an open fieldbus. It was standardized in DIN 19 245 and then later merged into the European standard EN 50 170, Vol. 2.

PROFIBUS DP (Decentralized Peripheral) is a version of PROFIBUS that is configured to meet the demands of a quick, efficient data exchange between a controller (PLC/PC) and decentralized (local) peripheral devices.

The devices can include sensors and actuators as well as digital or analog input and output modules.

A DP system consists of a DP master and up to 125 slaves:

Master: A DP master exchanges data with the DP slaves via PROFIBUS DP and monitors the data traffic. It transmits data between the superior controller and the decentralized peripheral.

Slave: The DP slaves form the link to the field. They prepare the input data of the peripheral for communication to the master and output the output data from the master to the peripheral.

The PROFIBUS uses the master-slave mode of operation for data transmission. The master reads the input data cyclically from the slaves and writes the output data to the slaves. Among other things, PROFIBUS DP/V1 also supports acyclic data exchange. PROFIBUS DP uses a transfer rate of 9.6 kBaud up to 12 MBaud.

Characteristics of PROFIBUS DP:

- Short response times
- High interference resistance
- Master and slave diagnostics
- Individual slaves can be disconnected or switched off without disrupting the ongoing bus operation.
- The complete configuration is stored in the DP master.
- Each slave has a manufacturer-specific identifier, which is assigned through the PNO.
- The slaves are described in the generic station description (GSD file). This file is imported to the configuration software and facilitates the slave configuration.

Information

PROFIBUS User Organization
The PROFIBUS User Organization makes documents about PROFIBUS available on its web site:
- Technical descriptions
- Directives
www.profibus.com

10.1.2 Cabling

On PROFIBUS with RS-485 transmission technology, all devices are connected in a linear topology. The bus line consists of a twisted and shielded core pair.

The fieldbus cable is specified as cable type A in EN 50 170 and must exhibit certain performance parameters. The cable type B also described in EN 50 170 is obsolete and should no longer be used.

Table 77: Technical data, bus line

Parameter	Value
Wave impedance	135 ... 165 Ω
Effective capacitance	< 30 pF/m
Loop resistance	110 Ω/km
Core diameter *)	> 0.64 mm
Core cross-section *)	> 0.34 mm^2

*) The core cross-sections used must correspond to the connection options on the bus connector.

The maximum cable lengths result with cable type A for a bus segment depending on the transfer rate.

Table 78: Transfer rate

Transfer rate		max. fieldbus segment length
9.6 / 19.2 / 45.45 / 93.75	kBaud	1200 m
187.5	kBaud	1000 m
500	kBaud	400 m
1500	kBaud	200 m
3000 / 6000 / 12000	kBaud	100 m

The 750-960, 750-970 fieldbus connectors offered by WAGO make it possible to connect the coming and going data cable to the connector directly. In this way, branch lines are avoided and the bus connector can plug in and unplug at any time without having to interrupt data traffic to the bus. A reversible bus terminator is integrated in these connectors. Due to the capacitive load of the bus node and the generated line reflection, connectors with integrated length inductances should be used. This is essential for transfer rates of > 1.5 Mbaud.

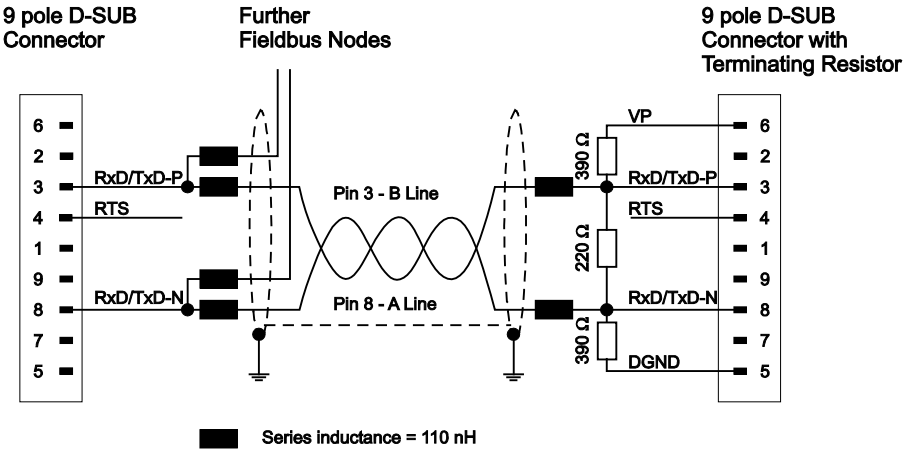

Figure 47: Bus connection

NOTICE

Install bus connection

When connecting the nodes, make sure that the data lines are not reversed.
The bus connection at the start and end of the bus line must be installed. The bus connection needs the supply voltage VP from the device. Therefore, ensure that the slave device, to which the bus connection is installed, is always supplied with power.
Due to the integrated length inductances in the connectors, installing connectors without attached field devices should be avoided because the lacking capacity of the device can cause transfer errors.

To achieve high interference immunity of the system against electromagnetic interference, a shielded PROFIBUS cable must be used. The shield should be on both ends if possible and the connection low resistance via large-area shield clamps with protective ground. In addition, it is important for the cable to be routed separately from all high-voltage cables if possible. For data rates ≥ 1.5 Mbit/s, branch lines must be avoided.

Information

PROFIBUS User Organization

The PNO makes other documents available on the Internet to its employees. For example, information about cable specifications is available in “Technical Guideline 2.111, PROFIBUS DP/FMS Installation Guidelines”.
http://www.profibus.com

Note

Shield Connecting System

WAGO offers the shield connecting system for optimal connection between fieldbus cable shielding and functional ground.

11 I/O Modules

11.1 Overview

For modular applications with the WAGO-I/O-SYSTEM 750/753, different types of I/O modules are available

- Digital Input Modules
- Digital Output Modules
- Analog Input Modules
- Analog Output Modules
- Specialty Modules
- System Modules

For detailed information on the I/O modules and the module variations, refer to the manuals for the I/O modules.

You will find these manuals on the WAGO web pages under www.wago.com.

Information

More Information about the WAGO-I/O-SYSTEM
Current information on the modular WAGO-I/O-SYSTEM is available in the Internet under: www.wago.com.

12 Use in Hazardous Environments

The **WAGO-I/O-SYSTEM 750** (electrical equipment) is designed for use in Zone 2 hazardous areas.

The following sections include both the general identification of components (devices) and the installation regulations to be observed. The individual subsections of the “Installation Regulations” section must be taken into account if the I/O module has the required approval or is subject to the range of application of the ATEX directive.

12.1 Marking Configuration Examples

12.1.1 Marking for Europe According to ATEX and IEC-Ex

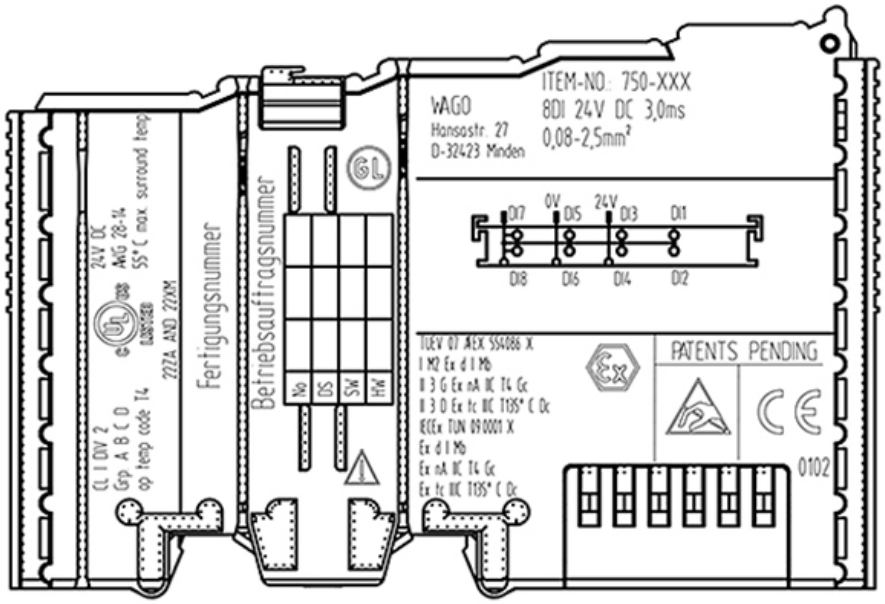

Figure 48: Side Marking Example for Approved I/O Modules According to ATEX and IECEx

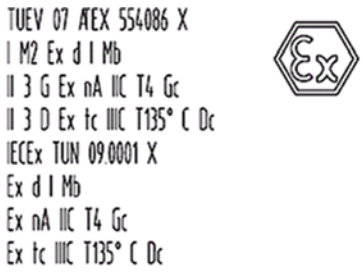

Figure 49: Text Detail – Marking Example for Approved I/O Modules According to ATEX and IECEx.

Table 79: Description of Marking Example for Approved I/O Modules According to ATEX and IECEx

Printing on Text	Description
TÜV 07 ATEX 554086 X IECEx TUN 09.0001 X	Approving authority and certificate numbers
Dust	
II	Equipment group: All except mining
3D	Category 3 (Zone 22)
Ex	Explosion protection mark
tc Dc	Type of protection and equipment protection level (EPL):protection by enclosure
IIIC	Explosion group of dust
T 135°C	Max. surface temperature of the enclosure (without a dust layer)
Mining	
I	Equipment group: Mining
M2	Category: High level of protection
Ex	Explosion protection mark
d Mb	Type of protection and equipment protection level (EPL): Flameproof enclosure
I	Explosion group for electrical equipment for mines susceptible to firedamp
Gases	
II	Equipment group: All except mining
3G	Category 3 (Zone 2)
Ex	Explosion protection mark
nA Gc	Type of protection and equipment protection level (EPL): Non-sparking equipment
nC Gc	Type of protection and equipment protection level (EPL): Sparking apparatus with protected contacts. A device which is so constructed that the external atmosphere cannot gain access to the interior
IIC	Explosion group of gas and vapours
T4	Temperature class: Max. surface temperature 135°C

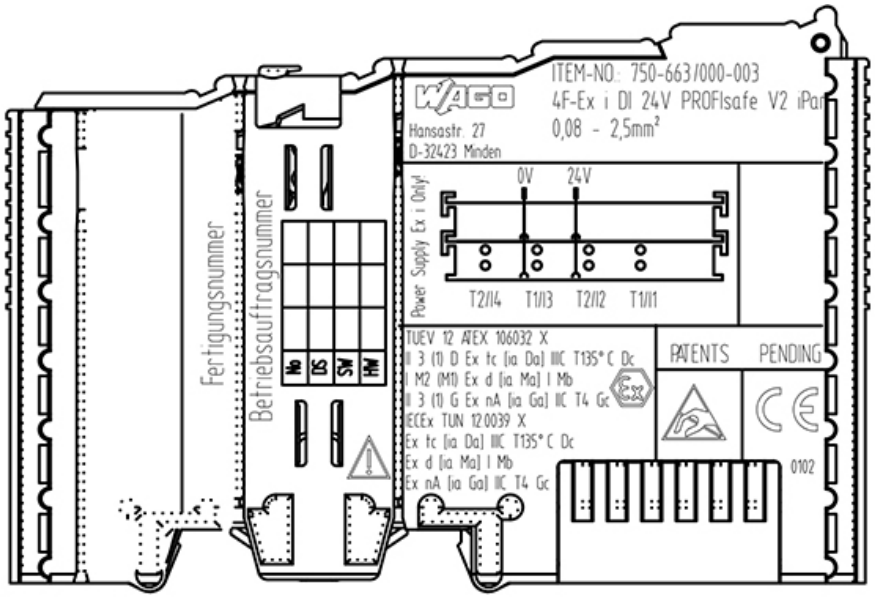

Figure 50: Side Marking Example for Approved Ex i I/O Modules According to ATEX and IECEx.

TUEV 12 ATEX 106032 X
II 3 (1) D Ex tc [ia Da] IIIC T135° C Dc
I M2 (M1) Ex d [ia Ma] I Mb
II 3 (1) G Ex nA [ia Ga] IIC T4 Gc
IECEx TUN 12.0039 X
Ex tc [ia Da] IIIC T135° C Dc
Ex d [ia Ma] I Mb
Ex nA [ia Ga] IIC T4 Gc

Figure 51: Text Detail – Marking Example for Approved Ex i I/O Modules According to ATEX and IECEx.

Table 80: Description of Marking Example for Approved Ex i I/O Modules According to ATEX and IECEx

Inscription Text	Description
TÜV 07 ATEX 554086 X IECEx TUN 09.0001X TÜV 12 ATEX 106032 X IECEx TUN 12.0039 X	Approving authority and certificate numbers
Dust	
II	Equipment group: All except mining
3(1)D	Category 3 (Zone 22) equipment containing a safety device for a category 1 (Zone 20) equipment
3(2)D	Category 3 (Zone 22) equipment containing a safety device for a category 2 (Zone 21) equipment
Ex	Explosion protection mark
tc Dc	Type of protection and equipment protection level (EPL): protection by enclosure
[ia Da]	Type of protection and equipment protection level (EPL): associated apparatus with intrinsic safety circuits for use in Zone 20
[ib Db]	Type of protection and equipment protection level (EPL): associated apparatus with intrinsic safety circuits for use in Zone 21
IIIC	Explosion group of dust
T 135°C	Max. surface temperature of the enclosure (without a dust layer)
Mining	
I	Equipment Group: Mining
M2 (M1)	Category: High level of protection with electrical circuits which present a very high level of protection
Ex d Mb	Explosion protection mark with Type of protection and equipment protection level (EPL): Flameproof enclosure
[ia Ma]	Type of protection and equipment protection level (EPL): associated apparatus with intrinsic safety electrical circuits
I	Explosion group for electrical equipment for mines susceptible to firedamp

Table 80: Description of Marking Example for Approved Ex i I/O Modules According to ATEX and IECEx

Gases	
II	Equipment group: All except mining
3(1)G	Category 3 (Zone 2) equipment containing a safety device for a category 1 (Zone 0) equipment
3(2)G	Category 3 (Zone 2) equipment containing a safety device for a category 2 (Zone 1) equipment
Ex	Explosion protection mark
nA Gc	Type of protection and equipment protection level (EPL): Non-sparking equipment
[ia Ga]	Type of protection and equipment protection level (EPL): associated apparatus with intrinsic safety circuits for use in Zone 0
[ia Gb]	Type of protection and equipment protection level (EPL): associated apparatus with intrinsic safety circuits for use in Zone 1
IIC	Explosion group of gas and vapours
T4	Temperature class: Max. surface temperature 135°C

12.1.2 Marking for America According to NEC 500

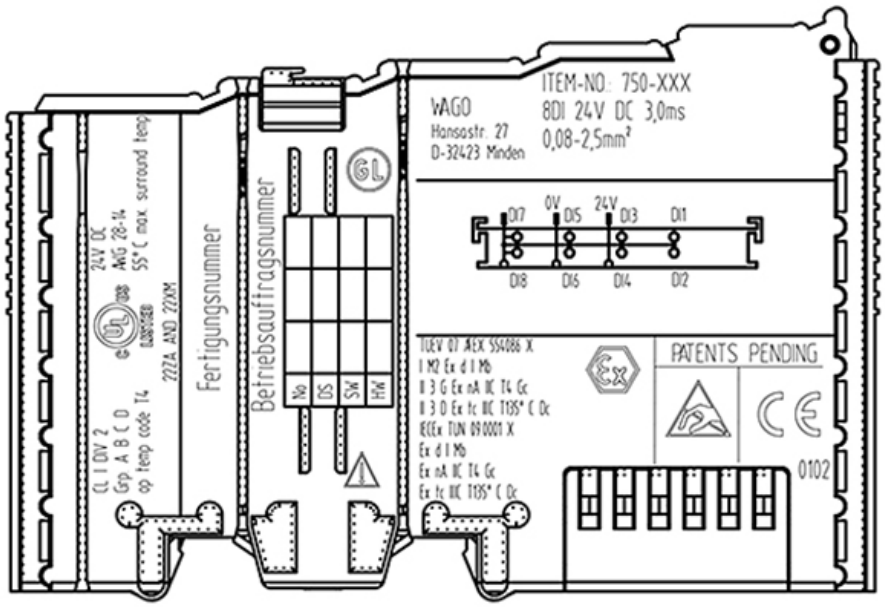

Figure 52: Side Marking Example for I/O Modules According to NEC 500

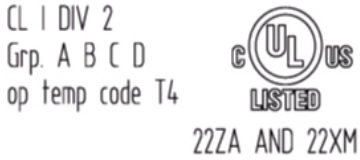

Figure 53: Text Detail – Marking Example for Approved I/O Modules According to NEC 500

Table 81: Description of Marking Example for Approved I/O Modules According to NEC 500

Printing on Text	Description
CL I	Explosion protection group (condition of use category)
DIV 2	Area of application
Grp. ABCD	Explosion group (gas group)
Op temp code T4	Temperature class

12.2 Installation Regulations

For the installation and operation of electrical equipment in hazardous areas, the valid national and international rules and regulations which are applicable at the installation location must be carefully followed.

12.2.1 Special Conditions for Safe Use (ATEX Certificate TÜV 07 ATEX 554086 X)

1. For use as Gc- or Dc-apparatus (in zone 2 or 22) the Field bus Independent I/O Modules WAGO-I/O-SYSTEM 750-*** shall be erected in an enclosure that fulfils the requirements of the applicable standards (see the marking) EN 60079-0, EN 60079-11, EN 60079-15 and EN 60079-31.
   For use as group I electrical apparatus M2 the apparatus shall be erected in an enclosure that ensures a sufficient protection according to EN 60079-0 and EN 60079-1 and the degree of protection IP64.
   The compliance of these requirements and the correct installation into an enclosure or a control cabinet of the devices shall be certified by an ExNB.
2. Measures have to be taken outside of the device that the rating voltage is not being exceeded of more than 40 % because of transient disturbances.
3. Dip-switches, binary-switches and potentiometers, connected to the module may only be actuated when explosive atmosphere can be excluded.
4. The connecting and disconnecting of the non-intrinsically safe circuits is only permitted during installation, for maintenance or for repair purposes. The temporal coincidence of explosion hazardous atmosphere and installation, maintenance resp. repair purposes shall be excluded.
   This is although and in particular valid for the interfaces “Memory-Card”, “USB”, “Fieldbus connection”, “Configuration and programming interface”, “antenna socket”, “D-Sub”, “DVI-port” and the “Ethernet interface”. These interfaces are not energy limited or intrinsically safe circuits. An operating of those circuits is in the behalf of the operator.
5. For the types 750-606, 750-625/000-001, 750-487/003-000, 750-484 and 750-633 the following shall be considered: The Interface circuits shall be limited to overvoltage category I/II/III (non mains/mains circuits) as defined in EN 60664-1.
6. For replaceable fuses the following shall be considered: Do not remove or replace the fuse when the apparatus is energized.
7. The following warnings shall be placed nearby the unit:
   WARNING – DO NOT REMOVE OR REPLACE FUSE WHEN ENERGIZED
   WARNING – DO NOT SEPARATE WHEN ENERGIZED
   WARNING – SEPARATE ONLY IN A NON-HAZARDOUS AREA

12.2.2 Special Conditions for Safe Use (ATEX Certificate TÜV 12 ATEX 106032 X)

1. For use as Gc- or Dc-apparatus (in zone 2 or 22) the Field bus Independent I/O Modules WAGO-I/O-SYSTEM 750-*** Ex i shall be erected in an enclosure that fulfils the requirements of the applicable standards (see the marking) EN 60079-0, EN 60079-11, EN 60079-15 and EN 60079-31.
   For use as group I electrical apparatus M2 the apparatus shall be erected in an enclosure that ensures a sufficient protection according to EN 60079-0 and EN 60079-1 and the degree of protection IP64.
   The compliance of these requirements and the correct installation into an enclosure or a control cabinet of the devices shall be certified by an ExNB.
2. Measures have to be taken outside of the device that the rating voltage is not being exceeded of more than 40 % because of transient disturbances.
3. The connecting and disconnecting of the non-intrinsically safe circuits is only permitted during installation, for maintenance or for repair purposes. The temporal coincidence of explosion hazardous atmosphere and installation, maintenance resp. repair purposes shall be excluded.
4. For the type the following shall be considered: The Interface circuits shall be limited to overvoltage category I/II/III (non mains/mains circuits) as defined in EN 60664-1.

12.2.3 Special Conditions for Safe Use (IEC-Ex Certificate TUN 09.0001 X)

1. For use as Gc- or Dc-apparatus (in zone 2 or 22) the Field bus Independent I/O Modules WAGO-I/O-SYSTEM 750-*** shall be erected in an enclosure that fulfils the requirements of the applicable standards (see the marking) IEC 60079-0, IEC 60079-11, IEC 60079-15 and IEC 60079-31.
   For use as group I electrical apparatus M2 the apparatus shall be erected in an enclosure that ensures a sufficient protection according to IEC 60079-0 and IEC 60079-1 and the degree of protection IP64.
   The compliance of these requirements and the correct installation into an enclosure or a control cabinet of the devices shall be certified by an ExCB.
2. Measures have to be taken outside of the device that the rating voltage is not being exceeded of more than 40 % because of transient disturbances.
3. DIP-switches, binary-switches and potentiometers, connected to the module may only be actuated when explosive atmosphere can be excluded.
4. The connecting and disconnecting of the non-intrinsically safe circuits is only permitted during installation, for maintenance or for repair purposes. The temporal coincidence of explosion hazardous atmosphere and installation, maintenance resp. repair purposes shall be excluded.
   This is although and in particular valid for the interfaces “Memory-Card”, “USB”, “Fieldbus connection”, “Configuration and programming interface”, “antenna socket”, “D-Sub”, “DVI-port” and the “Ethernet interface”. These interfaces are not energy limited or intrinsically safe circuits. An operating of those circuits is in the behalf of the operator.
5. For the types 750-606, 750-625/000-001, 750-487/003-000, 750-484 and 750-633 the following shall be considered: The Interface circuits shall be limited to overvoltage category I/II/III (non mains/mains circuits) as defined in IEC 60664-1.
6. For replaceable fuses the following shall be considered: Do not remove or replace the fuse when the apparatus is energized.
7. The following warnings shall be placed nearby the unit:
   WARNING – DO NOT REMOVE OR REPLACE FUSE WHEN ENERGIZED
   WARNING – DO NOT SEPARATE WHEN ENERGIZED
   WARNING – SEPARATE ONLY IN A NON-HAZARDOUS AREA

12.2.4 Special Conditions for Safe Use (IEC-Ex Certificate IECEx TUN 12.0039 X)

1. For use as Gc- or Dc-apparatus (in zone 2 or 22) the Field bus independent I/O Modules WAGO-I/O-SYSTEM 750-*** Ex i shall be erected in an enclosure that fulfils the requirements of the applicable standards (see the marking) IEC 60079-0, IEC 60079-11, IEC 60079-15, IEC 60079-31.
   For use as group I electrical apparatus M2 the apparatus shall be erected in an enclosure that ensures a sufficient protection according to IEC 60079-0 and IEC 60079-1 and the degree of protection IP64.
   The compliance of these requirements and the correct installation into an enclosure or a control cabinet of the devices shall be certified by an ExCB.
2. Measures have to be taken outside of the device that the rating voltage is not being exceeded of more than 40 % because of transient disturbances.
3. The connecting and disconnecting of the non-intrinsically safe circuits is only permitted during installation, for maintenance or for repair purposes. The temporal coincidence of explosion hazardous atmosphere and installation, maintenance resp. repair purposes shall be excluded.
4. For the type the following shall be considered: The Interface circuits shall be limited to overvoltage category I/II/III (non mains/mains circuits) as defined in IEC 60664-1.

12.2.5 Special Conditions for Safe Use according to ANSI/ISA 12.12.01

A. “This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D or non-hazardous locations only.”
B. “This equipment is to be fitted within tool-secured enclosures only.”
C. “WARNING Explosion hazard - substitution of components may impair suitability for Class I, Div. 2.”
D. “WARNING – Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous” has to be placed near each operator accessible connector and fuse holder.
E. When a fuse is provided, the following information shall be provided: “A switch suitable for the location where the equipment is installed shall be provided to remove the power from the fuse.”
F. For devices with EtherCAT/Ethernet connectors “Only for use in LAN, not for connection to telecommunication circuits.”
G. “WARNING - Use Module 750-642 only with antenna module 758-910.”
H. For Couplers/Controllers and Economy bus modules only: The instructions shall contain the following: “The configuration interface Service connector is for temporary connection only. Do not connect or disconnect unless the area is known to be non-hazardous. Connection or disconnection in an explosive atmosphere could result in an explosion.”
I. Modules containing fuses only: “WARNING - Devices containing fuses must not be fitted into circuits subject to over loads, e.g. motor circuits.”
J. Modules containing SD card reader sockets only: “WARNING - Do not connect or disconnect SD-Card while circuit is live unless the area is known to be free of ignitable concentrations of flammable gases or vapors.”

Information

Additional Information
Proof of certification is available on request.
Also take note of the information given on the operating and assembly instructions.
The manual, containing these special conditions for safe use, must be readily available to the user.

13 Appendix

13.1 Configuration Identifiers

13.1.1 Fieldbus Coupler

Table 82: Configuration Identifiers Fieldbus Coupler

Order No.	Description	Module
750-333	No PI Channel	0x00
750-333	2 Byte PI Channel	0xB1

13.1.2 Digital Input Modules

Table 83: Configuration Identifiers Digital Input Modules

Order No.	Description	Module	*-Module
75x-400	2DI/24V DC/3.0ms	0x10	0x00
75x-401	2DI/24V DC/0.2ms	0x10	0x00
75x-402	4DI/24V DC/3.0ms	0x10	0x00
75x-403	4DI/24V DC/0.2ms	0x10	0x00
75x-405	2DI/230V AC/10ms	0x10	0x00
75x-406	2DI/120V AC/10ms	0x10	0x00
75x-408	4DI/24V DC/3.0ms	0x10	0x00
75x-409	4DI/24V DC/0.2ms	0x10	0x00
75x-410	2DI/24V DC/3.0ms	0x10	0x00
75x-411	2DI/24V DC/0.2ms	0x10	0x00
75x-412	2DI/48V DC/3.0ms	0x10	0x00
75x-413	2DI/48V DC/0.2ms	0x10	0x00
75x-414	4DI/5V DC/0.2ms	0x10	0x00
75x-415	4DI/24V AC/DC/20ms	0x10	0x00
75x-416	2DI/120-230V AC	0x10	0x00
75x-418	2DI/24V DC/DIA/ACK	0x30	0x00
75x-419	2DI/24V DC/DIA	0x10	0x00
75x-421	2DI/24V DC/DIA	0x10	0x00
75x-422	4 DI/24V DC	0x10	0x00
75x-423	4DI/24V AC/DC/50ms	0x10	0x00
75x-424	4DI/24V DC	0x10	0x00
75x-425	2DI/24V DC/NAMUR	0x10	0x00
75x-427	2DI/110V DC	0x10	0x00
75x-428	4DI/42V AC/DC	0x10	0x00
75x-429	2DI/60V DC/3.0ms	0x10	0x00
75x-430	8DI/24V DC/3.0ms	0x10	-

Table 83: Configuration Identifiers Digital Input Modules

Order No.	Description	Module	*-Module
75x-431	8DI/24V DC/0.2ms	0x10	-
75x-432	4DI/24V DC/3.0ms	0x10	0x00
75x-433	4DI/24V DC/0.2ms	0x10	0x00
75x-434	8DI/5(12)V DC/0.2ms	0x10	-
75x-435	1DI/24V DC Ex i	0x10	0x00
75x-436	8DI/24V DC/3.0ms	0x10	-
75x-437	8DI/24V DC/0.2ms	0x10	-
75x-438	2DI/24V DC Ex i	0x10	0x00
75x-440	4DI/120-230V AC	0x10	0x00
750-1400	16DI/24V DC/3.0ms	0x11	-
750-1402	16DI/24V DC/3.0ms	0x11	-
75x-1405	16DI/24V DC/3.0ms	0x11	-
75x-1406	16DI/24V DC/0.2ms	0x11	-
75x-1407	16DI/24V DC/3.0ms	0x11	-
75x-1408	16DI/24V DC/0.2ms	0x11	-
75x-1415	8DI/24V DC/3.0 ms	0x10	-
75x-1416	8DI/24V DC/0.2 ms	0x10	-
75x-1417	8DI/24V DC/3.0 ms	0x10	-
75x-1418	8DI/24V DC/0.2 ms	0x10	-
75x-1420	4DI/24V DC/3.0 ms	0x10	0x00
75x-1421	4DI/24V DC/0.2 ms	0x10	0x00
75x-1422	4DI/24V DC/3.0 ms	0x10	0x00
75x-1423	4DI/24V DC/0.2 ms	0x10	0x00
75x-4dd	2DI	0x10	0x00
75x-4dd	2DI/DIA	0x10	0x00
75x-4dd	4DI	0x10	0x00
75x-4dd	8DI	0x10	-
75x-4dd	16DI	0x11	-

13.1.3 Digital Output Modules

Table 84: Configuration Identifiers Digital Output Modules

Order No.	Description	Module	*-Module
75x-501	2DO/24V DC/0.5A	0x20	0x00
75x-502	2DO/24V DC/2.0A	0x20	0x00
75x-504	4DO/24V DC/0.5A	0x20	0x00
75x-506	2DO/4 DIA-DI/DIA	0x30	-
75x-506	2DO/24V DC/0.5A/DIA	0x20	0x00
75x-507	2DO/2DIA-DI/DIA	0x30	-
75x-507	2DO/24V DC/2.0A/DIA	0x20	0x00
75x-508	2DO/2DIA-DI/DIA	0x30	-
75x-508	2DO/24V DC/2.0A/DIA	0x20	0x00
75x-509	2DO/230V AC/0.3A	0x20	0x00
75x-512	2DO Relay/250V AC	0x20	0x00
75x-513	2DO Relay/250V AC	0x20	0x00
75x-514	2DO Relay/125V AC	0x20	0x00
75x-516	4DO/24 VDC/0.5A	0x20	0x00
75x-517	2DO Relay/230V AC	0x20	0x00
75x-519	4DO/5V DC/20mA	0x20	0x00
75x-522	2DO/2DIA-DI/DIA	0x30	-
75x-522	2DO/230V AC/0.5A/DIA	0x20	0x00
750-523	1DO/2DIA-DI/DIA	0x30	-
750-523	1DO/230V AC/16A/DIA	0x20	0x00
75x-530	8DO/24V DC/0.5A	0x20	-
75x-531	4DO/24V DC/0.5A	0x20	0x00
75x-532	4DO/4DIA-DI/DIA	0x30	-
75x-532	4DO/24V DC/0.5A/DIA	0x20	0x00
75x-534	8DO/12V DC/1A	0x20	-
75x-535	2DO/24V DC/0.5A Ex i	0x20	0x00
75x-536	8DO/24V DC/0.5A	0x20	-
75x-537	8DO/8DIA-DI/DIA	0x30	-
75x-537	8DO/24V DC/0.5A/DIA	0x20	-
750-1500	16DO/24V DC/0.5A	0x21	-
750-1501	16DO/24V DC/0.5A	0x21	-
750-1502	8DI/DO/24V DC	0x30	-
75x-1504	16DO/24V DC/0.5A	0x21	-
75x-1505	16DO/24V DC/0.5A	0x21	-
75x-1506	8DI/DO/24V DC	0x30	-
75x-1515	8DO/24V DC/0.5A	0x20	-
75x-1516	8DO/24V DC/0.5A	0x20	-
75x-5dd	2DO	0x20	0x00
75x-5dd	2DO/2DIA-DI/DIA	0x30	-
75x-5dd	2DO/2DIA	0x20	0x00
75x-5dd	2DO/4DIA-DI/DIA	0x30	-
75x-5dd	2DO/4DIA	0x20	0x00
75x-5dd	4DO	0x20	0x00
75x-5dd	4DO/4DIA-DI/DIA	0x30	-
75x-5dd	4DO/DIA	0x20	0x00
75x-5dd	8DO	0x20	-
75x-5dd	8DO/8DIA-DI/DIA	0x30	-
75x-5dd	8DO/DIA	0x20	-

Table 84: Configuration Identifiers Digital Output Modules

Order No.	Description	Module	*-Module
75x-5dd	8DI/8DO	0x30	-
75x-5dd	16DO	0x21	-
Buerkert 8644 monost.	2DO	0x20	0x00
Buerkert 8644 monost.	3DO	0x20	0x00
Buerkert 8644 monost.	4DO	0x20	0x00
Buerkert 8644 bistab.	4DO	0x20	0x00
Buerkert 8644 monost.	8DO V1	0x20, 0x00, 0x00,0x00	-
Buerkert 8644 monost.	8DO V2	0x20	-
Buerkert 8644 monost.	16DO V2	0x21	-

13.1.4 Power Supply Modules

Table 85: Configuration Identifiers Power Supply Modules

Order No.	Description	Module	*-Module
750-606	Supply. 24V DC/DIA/Ex i	0x00	-
750-606	Dia. to I-PI	0x10	0x00
750-610	Supply 24V DC/DIA	0x00	-
750-610	Dia. to I-PI	0x10	0x00
750-611	Supply. 230V AC/DIA	0x00	-
750-611	Dia. to I-PI	0x10	0x00

13.1.5 Analog Input Modules

Table 86: Configuration Identifiers Analog Input Modules

Order No.	Description	Module	RA-Module
75x-450	4AI/RTD	0x53	0xF5
75x-451	8AI/RTD	0x57	0xFB
75x-452	2AI/0-20mA/diff.	0x51	0xF2
75x-453	4AI/0-20mA/SE	0x53	0xF5
75x-454	2AI/4-20mA/diff.	0x51	0xF2
75x-455	4AI/4-20mA/SE	0x53	0xF5
75x-456	2AI/+/-10V/diff.	0x51	0xF2
75x-457	4AI/+/-10V/SE	0x53	0xF5
75x-459	4AI/0-10V/SE	0x53	0xF5
75x-460	4AI/RTD	0x53	0xF5
75x-461	2AI/RTD	0x51	0xF2
75x-462	2AI/TC	0x51	0xF2
75x-463	4AI/RTD	0x53	0xF5
75x-464	4AI/RTD	0x53	0xF5
75x-464	4AI/NTC	0x53	0xF5
75x-464	2AI/RTD	0x51	0xF2
75x-465	2AI/0-20mA/SE	0x51	0xF2
75x-466	2AI/4-20mA/SE	0x51	0xF2
75x-467	2AI/0-10V/SE	0x51	0xF2
75x-468	4AI/0-10V/SE	0x53	0xF5
75x-469	2AI/TC/OCM	0x51	0xF2
75x-470	2AI/0-20mA/SE/OVLP	0x51	0xF2
75x-472	2AI/0-20mA/OVLP	0x51	0xF2
75x-473	2AI/4-20mA/SE/OVLP	0x51	0xF2
75x-474	2AI/4-20mA/OVLP	0x51	0xF2
75x-475	2AI/0-1A AC/DC/diff.	0x51	0xF2
75x-476	2AI/+/-10V/SE	0x51	0xF2
75x-477	2AI/0-10V AC/DC/diff.	0x51	0xF2
75x-478	2AI/0-10V/SE	0x51	0xF2
75x-479	2AI/+/-10V/diff.	0x51	0xF2
75x-480	2AI/0-20mA/diff.	0x51	0xF2
75x-481	2AI/RTD Ex i	0x51	0xF2
75x-482	2AI/4-20mA/SE	0x51	0xF2
75x-482	2AI/4-20mA/SE 1x2 HV	0x44,0x8B,0x03, 0x08,0x03,0x08	-
75x-482	2AI/4-20mA/SE 2x2 HV	0x44,0x93,0x03, 0x27,0x03,0x27	-
75x-482	2AI/4-20mA/SE 3x2 HV	0x44,0x9B,0x03, 0x27,0x03,0x27	-
75x-482	2AI/4-20mA/SE 4x2 HV	0x44,0xA3,0x03, 0x27,0x03,0x27	-
75x-482	2AI/SE/Cyclic Mailbox	0xC2,0x8B,0x8B, 0x0A,0x0A	-
75x-483	2AI/0-30V DC/diff.	0x51	0xF2
75x-484	2AI/4-20mA/SE/Ex i	0x51	0xF2
75x-484	2AI/4-20mA/SE/Ex i 1x2 HV	0x44,0x8B,0x03, 0x08,0x03,0x08	-
75x-484	2AI/4-20mA/SE/Ex i 2x2 HV	0x44,0x93,0x03, 0x27,0x03,0x27	-

Table 86: Configuration Identifiers Analog Input Modules

Order No.	Description	Module	RA-Module
75x-484	2AI/4-20mA/SE/Ex i 3x2 HV	0x44,0x9B,0x03, 0x27,0x03,0x27	-
75x-484	2AI/4-20mA/SE/Ex i 4x2 HV	0x44,0xA3,0x03, 0x27,0x03,0x27	-
75x-484	2AI/Ex i/Cyclic Mailbox	0xC2,0x8B,0x8B, 0x0A,0x0A	-
75x-485	2AI/4-20mA Ex i	0x51	0xF2
75x-487	2AI/TC/OCM/Ex i	0x51	0xF2
75x-491	1AI/DMS Bridge	0x51	0xF2
75x-492	2AI/4-20mA/diff.	0x51	0xF2
75x-493	3AI/3-Phase Measurement	0xF5	-
75x-494	3AI/3-Phase Measurement	0xFB	-
75x-495	3AI/3-Phase Measurement	0xFB	-
75x-4aa	2AI	0x51	0xF2
75x-4aa	4AI	0x53	0xF5

13.1.6 Analog Output Modules

Table 87: Configuration Identifiers Analog Output Modules

Order No.	Description	Module	RA-Module
75x-550	2AO/0-10V	0x61	0xF2
75x-552	2AO/0-20mA	0x61	0xF2
75x-553	4AO/0-20mA	0x63	0xF5
75x-554	2AO/4-20mA	0x61	0xF2
75x-555	4AO/4-20mA	0x63	0xF5
75x-556	2AO/+/-10V	0x61	0xF2
75x-557	4AO/+/-10V	0x63	0xF5
75x-559	4AO/0-10V	0x63	0xF5
75x-560	2AO/0-10V/100mW	0x61	0xF2
75x-562	2AO/0/+/-10V/16Bit	0x61	0xF2
75x-563	2AO/0/4-20mA/16Bit	0x61	0xF2
75x-585	2AO/4-20 mA/Ex i	0x61	0xF2
75x-5aa	2AO	0x61	0xF2
75x-5aa	4AO	0x63	0xF5

13.1.7 Special Modules

Table 88: Configuration Identifiers Special Modules

Order No	Description	Module	RA-Module
75x-404	U/D-Counter	0xF2	
75x-511	2 DO/24 V DC/PWM	0xF2	
75x-630	SSI-Interface	0x93	0xF2
75x-631	Encoder-Interface	0xB5	
75x-633	U/D-Counter /Ex i	0xF2	
75x-634	Encoder-Interface	0xB5	
75x-635	Dig. Impuls-Interface	0xB3	
75x-636	DC-Drive 24V DC/5A	0xF2	
75x-637	Encoder-Interface	0xF2	
75x-638	U/D-Counter	0xF2	
75x-641	DALI/DSI-Master	0xB5	
75x-642	ENOCEAN RF-Module	0xB3	
75x-643	MP-Bus-Master	0xB7	
75x-644	Bluetooth 12 Byte PA	0xC2, 0x8B, 0x8B, 0x0A, 0x0A	
75x-644	Bluetooth 24 Byte PA	0xC2, 0x97, 0x97, 0x0A, 0x0A	
75x-644	Bluetooth 48 Byte PA	0xC2, 0xAF, 0xAF, 0x0A, 0x0A	
75x-645	2AI/2DO/VIB	0xF5	
75x-650	RS232C-Intf. 5 Byte	0xB5	
75x-650	RS232C-Intf. 3 Byte	0xB3	
75x-651	TTY-Interface 5 Byte	0xB5	
75x-651	TTY-Interface 3 Byte	0xB3	
75x-652	Serial Interface 8 Byte	0xB7	
75x-652	Serial Interface 24 Byte	0xC2, 0x97, 0x97, 0x0A, 0x0A	
75x-652	RS485-Interface 48 Byte	0xC2, 0xAF, 0xAF, 0x0A, 0x0A	
75x-653	RS485-Interface 5 Byte	0xB5	
75x-653	RS485-Interface 3 Byte	0xB3	
75x-654	Data Exchange Module	0xF1	0xF2
75x-655	ASI-Master 12 Byte PA	0xC2, 0x8B, 0x8B, 0x0A, 0x0A	
75x-655	ASI-Master 20 Byte PA	0xC2, 0x93, 0x93, 0x0A, 0x0A	
75x-655	ASI-Master 24 Byte PA	0xC2, 0x97, 0x97, 0x0A, 0x0A	
75x-655	ASI-Master 32 Byte PA	0xC2, 0x9F, 0x9F, 0x0A, 0x0A	
75x-655	ASI-Master 40 Byte PA	0xC2, 0xA7, 0xA7, 0x0A, 0x0A	
75x-655	ASI-Master 48 Byte PA	0xC2, 0xAF, 0xAF, 0x0A, 0x0A	
75x-657	IOL-M SIO-Mode	0xB1	-
75x-657	IOL-M 4 Byte PA	0xB3	-
75x-657	IOL-M 6 Byte PA	0xB5	-
75x-657	IOL-M 8 Byte PA	0xB7	-
75x-657	IOL-M 10 Byte PA	0xB9	-
75x-657	IOL-M 14 Byte PA	0xBD	-
75x-657	IOL-M 18 Byte PA	0xF8	-
75x-657	IOL-M 22 Byte PA	0xFA	-
75x-660	8FDI/24V DC	0xC4, 0x84, 0x84, 0x05, 0x6E, 0x05, 0x6E	-
75x-661	4FDI/24V DC 4FDI iPar-Server	0xC4, 0x84, 0x84, 0x05, 0x6E, 0x05, 0x6E	-
75x-662	8FDI/24V DC 8FDI iPar-Server	0xC4, 0x84, 0x84, 0x05, 0x6E, 0x05, 0x6E	-

Table 88: Configuration Identifiers Special Modules

Order No	Description	Module	RA-Module
75x-665	4FDO 0.5A/4FDI 24V DC	0xC4, 0x84, 0x84, 0x05, 0x6E, 0x05, 0x6E	-
75x-666	4FDI/2FDO 24V/10A DC 4FDI/2FDO iPar-Server	0xC4, 0x84, 0x84, 0x05, 0x6E, 0x05, 0x6E	-
75x-667	4FDI/4FDO 24V/2.0A DC 4FDI/4FDO iPar-Server	0xC4, 0x84, 0x84, 0x05, 0x6E, 0x05, 0x6E	-
75x-670	Stepper/RS422/24V DC	0xC2, 0x8B, 0x8B, 0x0A, 0x0A	
75x-671	Stepper/24V DC/1A	0xC2, 0x8B, 0x8B, 0x0A, 0x0A	
750-672	Stepper/70V DC/7.5A	0xC2, 0x8B, 0x8B, 0x0A, 0x0A	
750-673	Servo/70V DC/7.5A/INC	0xC2, 0x8B, 0x8B, 0x0A, 0x0A	
75x-6aa	SF	0xF2	

13.2 PI Configuration

13.2.1 PI Configuration of the Fieldbus Coupler (Process Data Channel)

The configuration modules of the process data channel are divided into two module types:

Table 89: Fieldbus coupler – Module types

PBDP module type	Description	Proxy fieldbus couplers
PIC_DIS	No process data channel	750-333
PIC_ENA	2 byte process data channel	750-333

If available, fieldbus coupler services can be executed via the process data channel.
The following table lists the number of bytes reserved for the individual configuration module in the respective process image (PI).

Table 90: Fieldbus coupler – Number of bytes

Fieldbus coupler / PBDP module type	Proxy (PBDP module type)					
	Data length [Byte]		Configuration identifier		Data type	Inst.
	I	O	hex	dec		
PIC_DIS	0	0	0x00	0	-	-
PIC_ENA	2	2	0xB1	177	UINT8[2]	1

Note

Position of the configuration modules
One of these configuration modules has to be configured on slot number 1 of the configuration table.
If not, the fieldbus coupler returns a configuration error to the BUS LED and in the status message of the PROFIBUS diagnostics.

13.2.2 PI Configurations of the Digital Input Modules

The PI configurations of the digital input modules are divided into nine module types:

Table 91: Digital input modules – Module types

PBDP module type	Description	Proxy I/O modules
1DI_1PI-DIA (*1DI_1PI-DIA)	1-Channel Digital Input Modules, 1 bit diagnostics per signal channel in the input process image	75x-435
2DI (*2DI)	2-Channel Digital Input Modules	75x-400, 75x-401, 75x-405, 75x-406, 75x-410, 75x-411, 75x-412, 75x-413, 75x-416, 75x-427, 75x-429, 75x-438
2DI_2DIA (*2DI_2DIA)	2-Channel Digital Input Modules, channel diagnostics	75x-419, 75x-421, 75x-425
2DI_2PI-DIA (*2DI_2PI-DIA)	2-Channel Digital Input Modules, channel diagnostics, 1 bit diagnostics per signal channel in the input process image	75x-419, 75x-421, 75x-425
2DI_2DIA_2ACK (*2DI_2DIA_2ACK)	2-Channel Digital Input Modules, channel diagnostics, 1 bit diagnostic acknowledgement per signal channel in the output process image	75x-418
2DI_2PI-DIA_2ACK (*2DI_2PI-DIA_2ACK)	2-Channel Digital Input Modules, channel diagnostics, 1 bit diagnostics per signal channel in the input process image, 1 bit diagnostic acknowledgement per signal channel in the output process image	75x-418
4DI (*4DI)	4-Channel Digital Input Modules	75x-402, 75x-403, 75x-408, 75x-409, 75x-414, 75x-415, 75x-422, 75x-423, 75x-424, 75x-428, 75x-432, 75x-433, 75x-440, 75x-1420, 75x-1421, 75x-1422, 75x-1423
8DI	8-Channel Digital Input Modules	75x-430, 75x-431, 75x-434, 75x-436, 75x-437, 75x-1415, 75x-1416, 75x-1417, 75x-1418
16DI	16-Channel Digital Input Modules	750-1400, 750-1402, 75x-1405, 75x-1406, 75x-1407, 75x-1408

Digital input modules pass the status of the input channels and optional diagnostic information to the DP master. The following table lists the number of bytes or bits reserved for the individual configuration module in the respective process image (PI).

Table 92: Digital input modules – Number of bits and bytes

I/O Modules / PBDP module type	Proxy (PBDP module type)						* Proxy (PBDP module type)			
	Data length [Byte]				Configuration identifier		Data length [Byte]		Configuration identifier	
	PI packed?									
	No		Yes		hex	dec	I	O	hex	dec
	I	O	I	O						
1DI_1PI-DIA (*1DI_1PI-DIA)	1	0	2/8	0	0x10	16	2/8	0	0x00	0
2DI (*2DI)	1	0	2/8	0	0x10	16	2/8	0	0x00	0
2DI_2DIA (*2DI_2DIA)	1	0	2/8	0	0x10	16	2/8	0	0x00	0
2DI_2PI-DIA (*2DI_2PI-DIA)	1	0	4/8	0	0x10	16	2(4)/8	0	0x00	0
2DI_2DIA_2ACK (*2DI_2DIA_2ACK)	1	1	2/8	2/8	0x30	48	2/8	2/8	0x00	0
2DI_2PI-DIA_2ACK (*2DI_2PI-DIA_2ACK)	1	1	4/8	2/8	0x30	48	2(4)/8	2/8	0x00	0
4DI (*4DI)	1	0	4/8	0	0x10	16	4/8	0	0x00	0
8DI	1	0			0x10	16				
16DI	2	0			0x11	17				

The following table describes the process image information of the individual module types for digital input modules.

Table 93: Digital input modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
1DI_1PI-DIA	**I**	0							**D0**	**E0**
***1DI_1PI-DIA**	**I**	0					**D0**	**E0**		
					D0	**E0**				
			D0	**E0**						
2DI	**I**	0							**E1**	**E0**
***2DI**	**I**	0					**E1**	**E0**		
					E1	**E0**				
			E1	**E0**						
2DI_2DIA	**I**	0							**E1**	**E0**
***2DI_2DIA**	**I**	0					**E1**	**E0**		
					E1	**E0**				
			E1	**E0**						
2DI_2PI-DIA	**I**	0					**D1**	**D0**	**E1**	**E0**
***2DI_2PI-DIA**	**I**	0			**D1**	**D0**	**E1**	**E0**		
			D1	**D0**	**E1**	**E0**				
2DI_2DIA_2ACK	**I**	0							**E1**	**E0**
	O	0							**A1**	**A0**
***2DI_2DIA_2ACK**	**I**	0					**E1**	**E0**		
					E1	**E0**				
			E1	**E0**						
	O	0					**A1**	**A0**		
					A1	**A0**				
			A1	**A0**						
2DI_2PI-DIA_2ACK	**I**	0					**D1**	**D0**	**E1**	**E0**
	O	0							**A1**	**A0**
***2DI_2PI-DIA_2ACK**	**I**	0			**D1**	**D0**	**E1**	**E0**		
			D1	**D0**	**E1**	**E0**				
	O	0					**A1**	**A0**		
					A1	**A0**				
			A1	**A0**						
4DI	**I**	0					**E3**	**E2**	**E1**	**E0**
***4DI**	**I**	0			**E3**	**E2**	**E1**	**E0**		
			E3	**E2**	**E1**	**E0**				
8DI	**I**	0	**E7**	**E6**	**E5**	**E4**	**E3**	**E2**	**E1**	**E0**
16DI	**I**	0	**E7**	**E6**	**E5**	**E4**	**E3**	**E2**	**E1**	**E0**
		1	**E15**	**E14**	**E13**	**E12**	**E11**	**E10**	**E9**	**E8**

Exx	Bit position reserved with the binary information of a digital input channel.
Axx	Bit position reserved with the binary information of a digital output channel.
Dxx	Bit position reserved with the binary diagnostic information of a digital input or output channel.
	Bit position that can be populated with information from corresponding module types with *.
	Bit position reserved with information from corresponding module types with or without *.

13.2.3 PI Configurations of the Digital Output Modules

The PI configurations of the digital output modules are divided into fourteen module types:

Table 94: Digital output modules – Module types

PBDP module type	Description	Description
1DO_1DIA (*1DO_1DIA)	1-Channel Digital Output Modules, channel diagnostics	75x-523
1DO_1PI-DIA (*1DO_1PI-DIA)	1-Channel Digital Output Modules, channel diagnostics, 1 bit diagnostics per signal channel in the input process image	75x-523
2DO (*2DO)	2-Channel Digital Output Modules	75x-501, 75x-502, 75x-509, 75x-512, 75x-513, 75x-514, 75x-517, 75x-535
2DO_2DIA (*2DO_2DIA)	2-Channel Digital Output Modules, channel diagnostics	75x-507, 75x-508, 75x-522
2DO_2PI-DIA (*2DO_2PI-DIA)	2-Channel Digital Output Modules, channel diagnostics, 1 bit diagnostics per signal channel in the input process image	75x-507, 75x-508, 75x-522
2DO_4DIA (*2DO_4DIA)	2-Channel Digital Output Modules, channel diagnostics	75x-506
2DO_4PI-DIA (*2DO_4PI-DIA)	2-Channel Digital Output Modules, channel diagnostics, 2 bit diagnostics per signal channel in the input process image	75x-506
4DO (*4DO)	4-Channel Digital Output Modules	75x-504, 75x-516, 75x-519, 75x-531, 75x-540
4DO_4DIA (*4DO_4DIA)	4-Channel Digital Output Modules, channel diagnostics	75x-532
4DO_4PI-DIA (*4DO_4PI-DIA)	4-Channel Digital Output Modules, channel diagnostics, 1 bit diagnostics per signal channel in the input process image	75x-532
8DO	8-Channel Digital Output Modules	75x-530, 75x-534, 75x-536, 75x-1515, 75x-1516
8DO_8DIA	8-Channel Digital Output Modules, channel diagnostics	75x-537
8DO_8PI-DIA	8-Channel Digital Output Modules, channel diagnostics, 1 bit diagnostics per signal channel in the input process image	75x-537
16DO	16-Channel Digital Output Modules	750-1500, 75x-1501, 750-1504, 75x-1505

Digital output modules output the information received from the DP master to the peripheral and return optional diagnostic information to the DP master.
The following table lists the number of bytes or bits reserved for the individual configuration module in the respective process image (PI).

Table 95: Digital output modules – Number of bits and bytes

I/O Modules / PBDP module type	Proxy (PBDP module type)						*Proxy (PBDP module type)			
	Data length [Byte]				Configuration identifier		Data length [Byte]		Configuration identifier	
	PI packed?									
	No		Yes		hex	dec	I	O	hex	dec
	I	O	I	O						
1DO_1DIA (*1DO_1DIA)	0	1	0	1(2)/8	0x20	32	0	1(2)/8	0x00	0
1DO_1PI-DIA (*1DO_1PI-DIA)	1	1	1(2)/8	1(2)/8	0x30	48	1(2)/8	1(2)/8	0x00	0
2DO (*2DO)	0	1	0	2/8	0x20	32	0	2/8	0x00	0
2DO_2DIA (*2DO_2DIA)	0	1	0	2/8	0x20	32	0	2/8	0x00	0
2DO_2PI-DIA (*2DO_2PI-DIA)	1	1	2/8	2/8	0x30	48	2/8	2/8	0x00	0
2DO_4DIA (*2DO_4DIA)	0	1	0	2/8	0x20	32	0	2/8	0x00	0
2DO_4PI-DIA (*2DO_4PI-DIA)	1	1	4/8	2/8	0x30	48	4/8	2/8	0x00	0
4DO (*4DO)	0	1	0	4/8	0x20	32	0	4/8	0x00	0
4DO_4DIA (*4DO_4DIA)	0	1	0	4/8	0x20	32	0	4/8	0x00	0
4DO_4PI-DIA (*4DO_4PI-DIA)	1	1	4/8	4/8	0x30	48	4/8	4/8	0x00	0
8DO	0	1			0x20	32				
8DO_8DIA	0	1			0x20	32				
8DO_8PI-DIA	1	1			0x30	48				
16DO	0	2			0x21	33				

The following table describes the process image information of the individual module types for digital output modules.

Table 96: Digital output modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
1DO_1DIA	O	0							RES	A0
*1DO_1DIA	O	0					RES	A0		
					RES	A0				
			RES	A0						
1DO_1PI-DIA	O	0							RES	A0
	I	0							RES	D0
*1DO_1PI-DIA	O	0					RES	A0		
					RES	A0				
				RES	A0					
	I	0					RES	D0		
					RES	D0				
			RES	D0						
2DO	O	0							A1	A0
*2DO	O	0					A1	A0		
					A1	A0				
			A1	A0						
2DO_2DIA	O	0							A1	A0
*2DO_2DIA	O	0					A1	A0		
					A1	A0				
			A1	A0						
2DO_2PI-DIA	O	0							A1	A0
	I	0							D1	D0
*2DO_2PI-DIA	O	0					A1	A0		
					A1	A0				
			A1	A0						
	I	0					D1	D0		
					D1	D0				
			D1	D0						
2DO_4DIA	O	0							A1	A0
*2DO_4DIA	O	0					A1	A0		
					A1	A0				
			A1	A0						
2DO_4PI-DIA	O	0							A1	A0
	I	0					D3	D2	D1	D0
*2DO_4PI-DIA	O	0					A1	A0		
					A1	A0				
			A1	A0						
	I	0			D3	D2	D1	D0		
			D3	D2	D1	D0				
4DO	O	0					A3	A2	A1	A0
*4DO	O	0			A3	A2	A1	A0		
			A3	A2	A1	A0				

Table 96: Digital output modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
4DO_4DIA	**O**	0					**A3**	**A2**	**A1**	**A0**
***4DO_4DIA**	**O**	0			**A3**	**A2**	**A1**	**A0**		
			A3	**A2**	**A1**	**A0**				
4DO_4PI-DIA	**O**	0					**A3**	**A2**	**A1**	**A0**
	I	0					**D3**	**D2**	**D1**	**D0**
***4DO_4PI-DIA**	**O**	0			**A3**	**A2**	**A1**	**A0**		
			A3	**A2**	**A1**	**A0**				
	I	0			**D3**	**D2**	**D1**	**D0**		
			D3	**D2**	**D1**	**D0**				
8DO	**O**	0	**A7**	**A6**	**A5**	**A4**	**A3**	**A2**	**A1**	**A0**
8DO_8DIA	**O**	0	**A7**	**A6**	**A5**	**A4**	**A3**	**A2**	**A1**	**A0**
8DO_8PI-DIA	**O**	0	**A7**	**A6**	**A5**	**A4**	**A3**	**A2**	**A1**	**A0**
	I	0	**D7**	**D6**	**D5**	**D4**	**D3**	**D2**	**D1**	**D0**
16DO	**O**	0	**A7**	**A6**	**A5**	**A4**	**A3**	**A2**	**A1**	**A0**
		1	**A15**	**A14**	**A13**	**A12**	**A11**	**A10**	**A9**	**A8**

Exx Bit position reserved with the binary information of a digital input channel.

Axx Bit position reserved with the binary information of a digital output channel.

Dxx Bit position reserved with the binary diagnostic information of a digital input or output channel.

Bit position that can be populated with information from corresponding module types with *.

Bit position reserved with information from corresponding module types with or without *

13.2.4 PI configurations of the Digital Input/Output Modules

Only one configuration module is available for the digital input/output modules:

Table 97: Digital input/output modules – Module types

PBDP module type	Description	Proxy I/O modules
8DEA	8-Channel Digital Input/Output Modules	75x-1502, 75x-1506

Digital input/output modules output information received from the DP master to the periphery and return optional input information to the DP master.
The following table lists the number of bytes or bits reserved for the configuration module in the respective process image (PI).

Table 98: Digital input/output modules – Number of bits and bytes

I/O Modules / PBDP module type	Proxy (PBDP module type)						*Proxy (PBDP module type)			
	Data length [Byte]				Configuration identifier		Data length [Byte]		Configuration - identifier	
	PI packed?									
	No		Yes		hex	dec	I	O	hex	dec
	I	O	I	O						
8DI_8DO	1	1			0x30	48				

The following table describes the process image information of the module type for digital input/output modules.

Table 99: Digital input/output modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
8DI_8DO	**O**	0	**A7**	**A6**	**A5**	**A4**	**A3**	**A2**	**A1**	**A0**
	I	0	**E7**	**E6**	**E5**	**E4**	**E3**	**E2**	**E1**	**E0**

Exx Bit position reserved with the binary information of a digital input channel.

Axx Bit position reserved with the binary information of a digital output channel.

13.2.5 PI Configurations of the Analog Input Modules

The configuration modules of the analog input modules are divided into nine module types:

Table 100: Analog input modules – Module types

PBDP module type	Description	Proxy I/O modules
2AI	2-Channel Analog Input Modules, channel diagnostics 16 bit input data, opt. HART profile via PROFIBUS	75x-452, 75x-454, 75x-456, 75x-461, 75x-462, 75x-464, 75x-465, 75x-466, 75x-467, 75x-469, 75x-470, 75x-472, 75x-473, 75x-474, 75x-475, 75x-476, 75x-477, 75x-478, 75x-479, 75x-480, 75x-481, 75x-482, 75x-483, 75x-484, 75x-485, 75x-491, 75x-492
2AI_RA	2-Channel Analog Input Modules, channel diagnostics 16 bit input and output data plus control and status byte per signal channel, Access to the register structure via cyclic data exchange, opt. HART profile via PROFIBUS	75x-452, 75x-454, 75x-456, 75x-461, 75x-462, 75x-464, 75x-465, 75x-466, 75x-467, 75x-469, 75x-470, 75x-472, 75x-473, 75x-474, 75x-475, 75x-476, 75x-477, 75x-478, 75x-479, 75x-480, 75x-481, 75x-482, 75x-483, 75x-484, 75x-485, 75x-491, 75x-492
2AI_2HV	2-Channel Analog Input Modules, HART, channel diagnostics, 16 bit input data plus a 32 bit HART variable per signal channel	75x-482, 75x-484
2AI_4HV	2-Channel Analog Input Modules, HART, channel diagnostics, 16 bit input data plus two 32 bit HART variables per signal channel	75x-482, 75x-484
2AI_6HV	2-Channel Analog Input Modules, HART, channel diagnostics, 16 bit input data plus three 32 bit HART variables per signal channel	75x-482, 75x-484
2AI_8HV	2-Channel Analog Input Modules, HART, channel diagnostics, 16 bit input data plus four 32 bit HART variables per signal channel	75x-482, 75x-484
3AI_RA	3-Channel Analog Input Modules, channel diagnostics 16 bit input and output data plus control and status byte per signal channel, access to the register structure via cyclic data exchange	75x-493
4AI	4-Channel Analog Input Modules, channel diagnostics, 16 bit input data per signal channel	75x-450, 75x-453, 75x-455, 75x-457, 75x-459, 75x-460, 75x-463, 75x-464, 75x-468
4AI_RA	4-Channel Analog Input Modules, channel diagnostics, 16 bit input and output data plus control and status byte per signal channel, access to the register structure via cyclic data exchange	75x-450, 75x-453, 75x-455, 75x-457, 75x-459, 75x-460, 75x-463, 75x-464, 75x-468
8AI	8 Channel Analog Input Modules, 16 bit Input data per signal channel	75x-451
8AI_RA	8 Channel Analog Input Modules, channel diagnostics, 16 bit input and output data plus control and status byte per signal channel, access to the register structure via cyclic data exchange	75x-451
3PLM	3-Phase Power Measurement Modules, 16/32 bits data composition	75x-494, 75x-495

Analog input modules pass the digitalized process value of the input channels and optional channel diagnostic information to the DP master in each status byte. For I/O modules with HART interface, up to four HART variables can be transmitted as an option in addition to the input process values.
The following table lists the number of bytes reserved for the individual module in the respective process image (PI).

Table 101: Analog input modules – Number of bytes

I/O Modules / PBDP module type	Proxy (PBDP module type)					
	Data length [Byte]		Configuration identifier		Data type	Inst.
	I	O	hex	dec		
2AI	4	0	0x51	81	(U)INT16	2
2AI_RA	6	6	0xF2	242	UINT8, (U)INT16	2
2AI_2NV	12	0	0x44, 0x8B, 0x03, 0x08, 0x03, 0x08	68, 139, 3, 8, 3, 8	UINT16, FLOAT	2
2AI_4NV	20	0	0x44 0x93 0x03 0x27 0x03 0x27	68, 147, 3, 39, 3, 39	UINT16, FLOAT[2]	2
2AI_6NV	28	0	0x44 0x9B 0x03 0x27 0x03 0x27	68, 155, 3, 39, 3, 39	UINT16, FLOAT[3]	2
2AI_8NV	36	0	0x44 0xA3 0x03 0x27 0x03 0x27	68, 163, 3, 8, 3, 8	UINT16, FLOAT[4]	2
3AI_RA	12	12	0xF5	245	UINT8[2], (U)INT16	3
4AI	8	0	0x53	83	(U)INT16	4
4AI_RA	12	12	0xF5	245	UINT8, (U)INT16	4
8AI	16	0	0x57	87	(U)INT16	8
8AI_RA	24	24	0xFB	251	UINT8, (U)INT16	8
3PLM	24	24	0xFB	251	UINT8, (U)INT8[23]	1

The following table describes the process image information of the individual module types for analog input modules.

Table 102: Analog input modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
2AI	**I**	0	**Input data Channel 0, HB[4] (LB[5])**							
		1	**Input data Channel 0, LB[4] (HB[5])**							
		2	**Input data Channel 1, HB[4] (LB[5])**							
		3	**Input data Channel 1, LB[4] (HB[5])**							
2AI_RA	**I**	0	**PD RA**	**F 0**	**Status 0 / Register RES Channel 0 / Table 0**					
		1	**Input data Channel 0, HB[4] (LB[5])**				**Register data RD Table 0, HB[4] (LB[5])**			
		2	**Input data Channel 0, LB[4] (HB[5])**				**Register date RD Table 0, LB[4] (HB[5])**			
		3	**PD RA**	**F 0**	**Status 1 / Register RES Channel 1 / Table 1**					
		4	**Input data Channel 1, HB[4] (LB[5])**				**Register data RD Table 1, HB[4] (LB[5])**			
		5	**Input data Channel 1, LB[4] (HB[5])**				**Register data RD Table 1, LB[4] (HB[5])**			
	O	0	**PD RA**	**0 RW**	**Control 0 / Register REQ Channel 0 / Table 0**					
		1	**Register data WR Table 0, HB[4] (LB[5])**							
		2	**Register data WR Table 0, LB[4] (HB[5])**							
		3	**PD RA**	**0 RW**	**Control 1 / Register REQ Channel 1/ Table 1**					
		4	**Register data WR Table 1, HB[4] (LB[5])**							
		5	**Register data WR Table 1, LB[4] (HB[5])**							

Table 102: Analog input modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
2AI_2NV	**I**	0	**Input data Channel 0, HB[4] (LB[5])**							
		1	**Input data Channel 0, LB[4] (HB[5])**							
		2	**Secondary variable 1 Channel 0, Byte 3[4] (Byte 0[5])**							
		3	**Secondary variable 1 Channel 0, Byte 2[4] (Byte 1[5])**							
		4	**Secondary variable 1 Channel 0, Byte 1[4] (Byte 2[5])**							
		5	**Secondary variable 1 Channel 0, Byte 0[4] (Byte 3[5])**							
		6	**Input data Channel 1, HB[4] (LB[5])**							
		7	**Input data Channel 1, LB[4] (HB[5])**							
		8	**Secondary variable 1 Channel 1, Byte 3[4] (Byte 0[5])**							
		9	**Secondary variable 1 Channel 1, Byte 2[4] (Byte 1[5])**							
		10	**Secondary variable 1 Channel 1, Byte 1[4] (Byte 2[5])**							
		11	**Secondary variable 1 Channel 1, Byte 0[4] (Byte 3[5])**							
2AI_4NV	**I**	0	**Input data Channel 0, HB[4] (LB[5])**							
		1	**Input data Channel 0, LB[4] (HB[5])**							
		2	**Secondary variable 1 Channel 0, Byte 3[4] (Byte 0[5])**							
		3	**Secondary variable 1 Channel 0, Byte 2[4] (Byte 1[5])**							
		4	**Secondary variable 1 Channel 0, Byte 1[4] (Byte 2[5])**							
		5	**Secondary variable 1 Channel 0, Byte 0[4] (Byte 3[5])**							
		6	**Secondary variable 2 Channel 0, Byte 3[4] (Byte 0[5])**							
		7	**Secondary variable 2 Channel 0, Byte 2[4] (Byte 1[5])**							
		8	**Secondary variable 2 Channel 0, Byte 1[4] (Byte 2[5])**							
		9	**Secondary variable 2 Channel 0, Byte 0[4] (Byte 3[5])**							
		10	**Input data Channel 1, HB[4] (LB[5])**							
		11	**Input data Channel 1, LB[4] (HB[5])**							
		12	**Secondary variable 1 Channel 1, Byte 3[4] (Byte 0[5])**							
		13	**Secondary variable 1 Channel 1, Byte 2[4] (Byte 1[5])**							
		14	**Secondary variable 1 Channel 1, Byte 1[4] (Byte 2[5])**							
		15	**Secondary variable 1 Channel 1, Byte 0[4] (Byte 3[5])**							
		16	**Secondary variable 2 Channel 1, Byte 3[4] (Byte 0[5])**							
		17	**Secondary variable 2 Channel 1, Byte 2[4] (Byte 1[5])**							
		18	**Secondary variable 2 Channel 1, Byte 1[4] (Byte 2[5])**							
		19	**Secondary variable 2 Channel 1, Byte 0[4] (Byte 3[5])**							

Table 102: Analog input modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
2AI_6NV	**I**	0	**Input data Channel 0, HB[4] (LB[5])**							
		1	**Input data Channel 0, LB[4] (HB[5])**							
		2	**Secondary variable 1 Channel 0, Byte 3[4] (Byte 0[5])**							
		3	**Secondary variable 1 Channel 0, Byte 2[4] (Byte 1[5])**							
		4	**Secondary variable 1 Channel 0, Byte 1[4] (Byte 2[5])**							
		5	**Secondary variable 1 Channel 0, Byte 0[4] (Byte 3[5])**							
		6	**Secondary variable 2 Channel 0, Byte 3[4] (Byte 0[5])**							
		7	**Secondary variable 2 Channel 0, Byte 2[4] (Byte 1[5])**							
		8	**Secondary variable 2 Channel 0, Byte 1[4] (Byte 2[5])**							
		9	**Secondary variable 2 Channel 0, Byte 0[4] (Byte 3[5])**							
		10	**Secondary variable 3 Channel 0, Byte 3[4] (Byte 0[5])**							
		11	**Secondary variable 3 Channel 0, Byte 2[4] (Byte 1[5])**							
		12	**Secondary variable 3 Channel 0, Byte 1[4] (Byte 2[5])**							
		13	**Secondary variable 3 Channel 0, Byte 0[4] (Byte 3[5])**							
		14	**Input data Channel 1, HB[4] (LB[5])**							
		15	**Input data Channel 1, LB[4] (HB[5])**							
		16	**Secondary variable 1 Channel 1, Byte 3[4] (Byte 0[5])**							
		17	**Secondary variable 1 Channel 1, Byte 2[4] (Byte 1[5])**							
		18	**Secondary variable 1 Channel 1, Byte 1[4] (Byte 2[5])**							
		19	**Secondary variable 1 Channel 1, Byte 0[4] (Byte 3[5])**							
		20	**Secondary variable 2 Channel 1, Byte 3[4] (Byte 0[5])**							
		21	**Secondary variable 2 Channel 1, Byte 2[4] (Byte 1[5])**							
		22	**Secondary variable 2 Channel 1, Byte 1[4] (Byte 2[5])**							
		23	**Secondary variable 2 Channel 1, Byte 0[4] (Byte 3[5])**							
		24	**Secondary variable 3 Channel 1, Byte 3[4] (Byte 0[5])**							
		25	**Secondary variable 3 Channel 1, Byte 2[4] (Byte 1[5])**							
		26	**Secondary variable 3 Channel 1, Byte 1[4] (Byte 2[5])**							
		27	**Secondary variable 3 Channel 1, Byte 0[4] (Byte 3[5])**							

Table 102: Analog input modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
2AI_8NV	**I**	0	**Input data Channel 0, HB[4] (LB[5])**							
		1	**Input data channel 0 LB[4] (HB[5])**							
		2	**Secondary variable 1 Channel 0, Byte 3[4] (Byte 0[5])**							
		3	**Secondary variable 1 Channel 0, Byte 2[4] (Byte 1[5])**							
		4	**Secondary variable 1 Channel 0. Byte 1[4] (Byte 2[5])**							
		5	**Secondary variable 1 Channel 0, Byte 0[4] (Byte 3[5])**							
		6	**Secondary variable 2 Channel 0, Byte 3[4] (Byte 0[5])**							
		7	**Secondary variable 2 Channel 0, Byte 2[4] (Byte 1[5])**							
		8	**Secondary variable 2 Channel 0, Byte 1[4] (Byte 2[5])**							
		9	**Secondary variable 2 Channel 0, Byte 0[4] (Byte 3[5])**							
		10	**Secondary variable 3 Channel 0, Byte 3[4] (Byte 0[5])**							
		11	**Secondary variable 3 Channel 0, Byte 2[4] (Byte 1[5])**							
		12	**Secondary variable 3 Channel 0, Byte 1[4] (Byte 2[5])**							
		13	**Secondary variable 3 Channel 0, Byte 0[4] (Byte 3[5])**							
		14	**Secondary variable 4 Channel 0, Byte 3[4] (Byte 0[5])**							
		15	**Secondary variable 4 Channel 0, Byte 2[4] (Byte 1[5])**							
		16	**Secondary variable 4 Channel 0, Byte 1[4] (Byte 2[5])**							
		17	**Secondary variable 4 Channel 0, Byte 0[4] (Byte 3[5])**							
		18	**Input data Channel 1, HB[4] (LB[5])**							
		19	**Input data Channel 1, LB[4] (HB[5])**							
		20	**Secondary variable 1 Channel 1, Byte 3[4] (Byte 0[5])**							
		21	**Secondary variable 1 Channel 1, Byte 2[4] (Byte 1[5])**							
		22	**Secondary variable 1 Channel 1, Byte 1[4] (Byte 2[5])**							
		23	**Secondary variable 1 Channel 1, Byte 0[4] (Byte 3[5])**							
		24	**Secondary variable 2 Channel 1, Byte 3[4] (Byte 0[5])**							
		25	**Secondary variable 2 Channel 1, Byte 2[4] (Byte 1[5])**							
		26	**Secondary variable 2 Channel 1, Byte 1[4] (Byte 2[5])**							
		27	**Secondary variable 2 Channel 1, Byte 0[4] (Byte 3[5])**							
		28	**Secondary variable 3 Channel 1, Byte 3[4] (Byte 0[5])**							
		29	**Secondary variable 3 Channel 1, Byte 2[4] (Byte 1[5])**							
		30	**Secondary variable 3 Channel 1, Byte 1[4] (Byte 2[5])**							
		31	**Secondary variable 3 Channel 1, Byte 0[4] (Byte 3[5])**							

Table 102: Analog input modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation 2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
		32	Secondary variable 4 Channel 1, Byte 3^4 (Byte 0^5)							
		33	Secondary variable 4 Channel 1, Byte 2^4 (Byte 1^5)							
		34	Secondary variable 4 Channel 1, Byte 1^4 (Byte 2^5)							
		35	Secondary variable 4 Channel 1, Byte 0^4 (Byte 3^5)							
3AI_RA	I	0	PD RA	F 0	Status 0 / Register RES Channel 0 / Table 0					
		1								
		2	Input data Channel 0, HB^4 (LB^5)						Register data RD Table 0, HB^4 (LB^5)	
		3	Input data Channel 0, LB^4 (HB^5)						Register data RD Table 0, LB^4 (HB^5)	
		4	PD RA	F 0	Status 1 / Register RES Channel 1 / Table 1					
		5								
		6	Input data Channel 1, HB^4 (LB^5)						Register data RD Table 1, HB^4 (LB^5)	
		7	Input data Channel 1, LB^4 (HB^5)						Register data RD Table 1, LB^4 (HB^5)	
		8	PD RA	F 0	Status 2 / Register RES Channel 2 / Table 2					
		9								
		10	Input data Channel 2, HB^4 (LB^5)						Register data RD Table 2, HB^4 (LB^5)	
		11	Input data Channel 2, LB^4 (HB^5)						Register data RD Table 2, LB^4 (HB^5)	
	O	0	PD RA	0 RW	Control 0 / Register REQ Channel 0 / Table 0					
		1								
		2	Register data WR Table 0, HB^4 (LB^5)							
		3	Register data WR Table 0, LB^4 (HB^5)							
		4	PD RA	0 RW	Control 1 / Register REQ Channel 1 / Table 1					
		5								
		6	Register data WR Table 1, HB^4 (LB^5)							
		7	Register data WR Table 1, LB^4 (HB^5)							
		8	PD RA	0 RW	Control 2 / Register REQ Channel 2 / Table 2					
		9								
		10	Register data WR Table 2, HB^4 (LB^5)							
		11	Register data WR Table 2, LB^4 (HB^5)							

Table 102: Analog input modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
4AI	**I**	0	**Input data Channel 0, HB[4] (LB[5])**							
		1	**Input data Channel 0, LB[4] (HB[5])**							
		2	**Input data Channel 1, HB[4] (LB[5])**							
		3	**Input data Channel 1, LB[4] (HB[5])**							
		4	**Input data Channel 2, HB[4] (LB[5])**							
		5	**Input data Channel 2, LB[4] (HB[5])**							
		6	**Input data Channel 3, HB[4] (LB[5])**							
		7	**Input data Channel 3, LB[4] (HB[5])**							

Table 102: Analog input modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
4AI_RA	I	0	PD RA	F 0	Status 0 / Register RES Channel 0 / Table 0					
		1	Input data Channel 0, HB[4] (LB[5])				Register data RD Table 0, HB[4] (LB[5])			
		2	Input data Channel 0, LB[4] (HB[5])				Register data RD Table 0, LB[4] (HB[5])			
		3	PD RA	F 0	Status 1 / Register RES Channel 1 / Table 1					
		4	Input data Channel 1, HB[4] (LB[5])				Register data RD Table 1, HB[4] (LB[5])			
		5	Input data Channel 1, LB[4] (HB[5])				Register data RD Table 1, LB[4] (HB[5])			
		6	PD RA	F 0	Status 2 / Register RES Channel 2 / Table 2					
		7	Input data Channel 2, HB[4] (LB[5])				Register data RD Table 2, HB[4] (LB[5])			
		8	Input data Channel 2, LB[4] (HB[5])				Register data RD Table 2, LB[4] (HB[5])			
		9	PD RA	F 0	Status 3 / Register RES Channel 3 / Table 3					
		10	Input data Channel 3, HB[4] (LB[5])				Register data RD Table 3, HB[4] (LB[5])			
		11	Input data Channel 3, LB[4] (HB[5])				Register data RD Table 3, LB[4] (HB[5])			
	O	0	PD RA	0 RW	Control 0 / Register REQ Channel 0 / Table 0					
		1	Register data WR Table 0, HB[4] (LB[5])							
		2	Register data WR Table 0, LB[4] (HB[5])							
		3	PD RA	0 RW	Control 1 / Register REQ Channel 1 / Table 1					
		4	Register data WR Table 1, HB[4] (LB[5])							
		5	Register data WR Table 1, LB[4] (HB[5])							
		6	PD RA	0 RW	Control 2 / Register REQ Channel 2 / Table 2					
		7	Register data WR Table 2, HB[4] (LB[5])							
		8	Register data WR Table 2, LB[4] (HB[5])							
		9	PD RA	0 RW	Control 3 / Register REQ Channel 3 / Table 3					
		10	Register data WR Table 3, HB[4] (LB[5])							
		11	Register data WR Table 3, LB[4] (HB[5])							

Table 102: Analog input modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
8AI	**I**	0	**Input data Channel 0, HB[4] (LB[5])**							
		1	**Input data Channel 0, LB[4] (HB[5])**							
		2	**Input data Channel 1, HB[4] (LB[5])**							
		3	**Input data Channel 1, LB[4] (HB[5])**							
		4	**Input data Channel 2, HB[4] (LB[5])**							
		5	**Input data Channel 2, LB[4] (HB[5])**							
		6	**Input data Channel 3, HB[4] (LB[5])**							
		7	**Input data Channel 3, LB[4] (HB[5])**							
		8	**Input data Channel 4, HB[4] (LB[5])**							
		8	**Input data Channel 4, HB[4] (LB[5])**							
		10	**Input data Channel 5, HB[4] (LB[5])**							
		11	**Input data Channel 5, HB[4] (LB[5])**							
		12	**Input data Channel 6, HB[4] (LB[5])**							
		13	**Input data Channel 6, HB[4] (LB[5])**							
		14	**Input data Channel 7, HB[4] (LB[5])**							
		15	**Input data Channel 7, HB[4] (LB[5])**							

Table 102: Analog input modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
8AI_RA	I	0	PD RA	F 0	Status 0 / Register RES Channel 0 / Table 0					
		1	Input data Channel 0, HB[4] (LB[5])				Register data RD Table 0, HB[4] (LB[5])			
		2	Input data Channel 0, LB[4] (HB[5])				Register data RD Table 0, LB[4] (HB[5])			
		3	PD RA	F 0	Status 1 / Register RES Channel 1 / Table 1					
		4	Input data Channel 1, HB[4] (LB[5])				Register data RD Table 1, HB[4] (LB[5])			
		5	Input data Channel 1, LB[4] (HB[5])				Register data RD Table 1, LB[4] (HB[5])			
		6	PD RA	F 0	Status 2 / Register RES Channel 2 / Table 2					
		7	Input data Channel 2, HB[4] (LB[5])				Register data RD Table 2, HB[4] (LB[5])			
		8	Input data Channel 2, LB[4] (HB[5])				Register data RD Table 2, LB[4] (HB[5])			
		9	PD RA	F 0	Status 3 / Register RES Channel 3 / Table 3					
		10	Input data Channel 3, HB[4] (LB[5])				Register data RD Table 3, HB[4] (LB[5])			
		11	Input data Channel 3, LB[4] (HB[5])				Register data RD Table 3, LB[4] (HB[5])			
		12	PD RA	F 0	Status 4 / Register RES Channel 4 / Table 4					
		13	Input data Channel 4, HB[4] (LB[5])				Register data RD Table 4, HB[4] (LB[5])			
		14	Input data Channel 4, LB[4] (HB[5])				Register data RD Table 4, LB[4] (HB[5])			
		15	PD RA	F 0	Status 5 / Register RES Channel 5 / Table 5					
		16	Input data Channel 5, HB[4] (LB[5])				Register data RD Table 5, HB[4] (LB[5])			
		17	Input data Channel 5, LB[4] (HB[5])				Register data RD Table 5, LB[4] (HB[5])			
		18	PD RA	F 0	Status 6 / Register RES Channel 6 / Table 6					
		19	Input data Channel 6, HB[4] (LB[5])				Register data RD Table 6, HB[4] (LB[5])			
		20	Input data Channel 6, LB[4] (HB[5])				Register data RD Table 6, LB[4] (HB[5])			
		21	PD RA	F 0	Status 7 / Register RES Channel 7 / Table 7					
		22	Input data Channel 7, HB[4] (LB[5])				Register data RD Table 7, HB[4] (LB[5])			
		23	Input data Channel 7, LB[4] (HB[5])				Register data RD Table 7, LB[4] (HB[5])			
	O	0	PD RA	0 RW	Control 0 / Register REQ Channel 0 / Table 0					
		1	Register data WR Table 0, HB[4] (LB[5])							
		2	Register data WR Table 0, LB[4] (HB[5])							
		3	PD RA	0 RW	Control 1 / Register REQ Channel 1 / Table 1					
		4	Register data WR Table 1, HB[4] (LB[5])							
		5	Register data WR Table 1, LB[4] (HB[5])							
		6	PD RA	0 RW	Control 2 / Register REQ Channel 2 / Table 2					
		7	Register data WR Table 2, HB[4] (LB[5])							

Table 102: Analog input modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
		8	**Register data WR Table 2, LB[4] (HB[5])**							
		9	**PD RA**	**0 RW**	**Control 3 / Register REQ Channel 3 / Table 3**					
		10	**Register data WR Table 3, HB[4] (LB[5])**							
		11	**Register data WR Table 3, LB[4] (HB[5])**							
		12	**PD RA**	**0 RW**	**Control 4 / Register REQ Channel 4 / Table 4**					
		13	**Register data WR Table 4, HB[4] (LB[5])**							
		14	**Register data WR Table 4, LB[4] (HB[5])**							
		15	**PD RA**	**0 RW**	**Control 5 / Register REQ Channel 5 / Table 5**					
		16	**Register data WR Table 5, HB[4] (LB[5])**							
		17	**Register data WR Table 5, LB[4] (HB[5])**							
		18	**PD RA**	**0 RW**	**Control 6 / Register REQ Channel 6 / Table 6**					
		19	**Register data WR Table 6, HB[4] (LB[5])**							
		20	**Register data WR Table 6, LB[4] (HB[5])**							
		21	**PD RA**	**0 RW**	**Control 7 / Register REQ Channel 7 / Table 7**					
		22	**Register data WR Table 7, HB[4] (LB[5])**							
		23	**Register data WR Table 7, LB[4] (HB[5])**							

Table 102: Analog input modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
3PLM	I	0	PD RA	F 0	Statuswort 0 / Register RES Channel 0 / Table 0					
		1	Status word 0 HB					Register data RD Table 0, LB		
		2	Expanded status word 1 LB					Register data RD Table 0, HB		
		3	Expanded status word 1 HB							
		4	Expanded status word 2 LB							
		5	Expanded status word 2 HB							
		6	Expanded status word 3 LB							
		7	Expanded status word 3 HB							
		8	Process value 1, Byte 0, LB							
		9	Process value 1, Byte 1							
		10	Process value 2, Byte 2							
		11	Process value 3, Byte 3, HB							
		12	Process value 2, Byte 0, LB							
		13	Process value 2, Byte 1							
		14	Process value 2, Byte 2							
		15	Process value 2, Byte 3, HB							
		16	Process value 3, Byte 0, LB							
		17	Process value 3, Byte 1							
		18	Process value 3, Byte 2							
		19	Process value 3, Byte 3, HB							
		20	Process value 4, Byte 0, LB							
		2	Process value 4, Byte 1							
		22	Process value 4, Byte 2							
		23	Process value 4, Byte 3, HB							
	O	0	PD RA	0 RW	Control word 0 / Register REQ Channel 0 / Table 0					
		1	Control word 0 HB					Register data WR Table 0, HB[4] (LB[5])		
		2	Expanded control word 1 LB					Register data WR Table 0, LB[4] (HB[5])		
		3	Expanded control word 1 HB							
		4	Expanded control word 2 LB							
		5	Expanded control word 2 HB							
		6	Expanded control word 3 LB							
		7	Expanded control word 3 HB							
		8								

Table 102: Analog input modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
		9								
		10								
		11								
		12								
		13								
		14								
		15								
		16								
		17								
		18								
		19								
		20								
		21								
		22								
		23								

[4] Format MOTOROLA
[5] Format INTEL

13.2.6 PI Configurations of the Analog Output Modules

The configuration modules of the analog output modules are divided into four module types:

Table 103: Analog output modules – Module types

PBDP module type	Description	Proxy I/O Modules
2AO	2-Channel Analog Output Modules, optional channel diagnostics, 16 bit output data per signal channel	75x-550, 75x-552, 75x-554, 75x-556, 75x-560, 75x-562, 75x-563, 75x-585
2AO_RA	2-Channel Analog Output Modules, optional channel diagnostics, 16 bit input and output data plus control and status byte per signal channel, access to the register structure via cyclic data exchange	75x-550, 75x-552, 75x-554, 75x-556, 75x-560, 75x-562, 75x-563, 75x-585
4AO	4- Channel Analog Output Modules, optional channel diagnostics, 16 bit output data per signal channel	75x-551, 75x-553, 75x-555, 75x-557, 75x-559
4AO_RA	4- Channel Analog Output Modules, optional channel diagnostics, 16 bit input and output data plus control and status byte per signal channel, access to the register structure via cyclic data exchange	75x-551, 75x-553, 75x-555, 75x-557, 75x-559

Analog output modules provide the digital output information from the DP master to the peripheral devices; they then return optional channel diagnostic information to the DP master in the respective status byte.
The following table lists the number of bytes reserved for the individual module in the respective process image (PI)

Table 104: Analog output modules – Number of bytes

I/O Modules / PBDP module type	Proxy (PBDP module type)					
	Data length [Byte]		Configuration identifier		Data type	Inst.
	I	O	hex	dec		
2AO	0	4	0x61	81	(U)INT16	2
2AO_RA	6	6	0xF2	242	UINT8, (U)INT16	2
4AO	0	8	0x63	83	(U)INT16	4
4AO_RA	12	12	0xF5	245	UINT8, (U)INT16	4

The following table describes the process image information of the individual module types for analog output modules.

Table 105: Analog output modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
2AO	**O**	0	**Output data Channel 0, HB[4] (LB[5])**							
		1	**Output data Channel 0, LB[4] (HB[5])**							
		2	**Output data Channel 1, HB[4] (LB[5])**							
		3	**Output data Channel 1, LB[4] (HB[5])**							
2AO_RA	**I**	0	**PD RA**	**F 0**	**Status 0 / Register RES Channel 0 / Table 0**					
		1	**Register data RD Table 0, HB[4] (LB[5])**							
		2	**Register data RD Table 0, LB[4] (HB[5])**							
		3	**PD RA**	**F 0**	**Status 1 / Register RES Channel 1 / Table 0**					
		4	**Register data RD Table 1, HB[4] (LB[5])**							
		5	**Register data RD Table 1, LB[4] (HB[5])**							
	O	0	**PD RA**	**0 RW**	**Control 0 / Register REQ Channel 0 / Table 0**					
		1	**Output data Channel 0, HB[4] (LB[5])**					**Register data WR Table 0, HB[4] (LB[5])**		
		2	**Output data Channel 0, LB[4] (HB[5])**					**Register data WR Table 0, LB[4] (HB[5])**		
		3	**PD RA**	**0 RW**	**Control 1 / Register REQ Channel 1 / Table 1**					
		4	**Output data Channel 1, HB[4] (LB[5])**					**Register data WR Table 1, HB[4] (LB[5])**		
		5	**Output data Channel 1, LB[4] (HB[5])**					**Register data WR Table 1, LB[4] (HB[5])**		
4AO	**O**	0	**Output data Channel 0, HB[4] (LB[5])**							
		1	**Output data Channel 0, LB[4] (HB[5])**							
		2	**Output data Channel 1, HB[4] (LB[5])**							
		3	**Output data Channel 1, LB[4] (HB[5])**							
		4	**Output data Channel 2, HB[4] (LB[5])**							
		5	**Output data Channel 2, LB[4] (HB[5])**							
		6	**Output data Channel 3, HB[4] (LB[5])**							
		7	**Output data Channel 3, LB[4] (HB[5])**							

Table 105: Analog output modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
4AO_RA	I	0	PD RA	F 0	Status 0 / Register RES Channel 0 / Table 0					
		1	Register data RD Table 0, HB[4] (LB[5])							
		2	Register data RD Table 0, LB[4] (HB[5])							
		3	PD RA	F 0	Status 1 / Register RES Channel 1 / Table 1					
		4	Register data RD Table 1, HB[4] (LB[5])							
		5	Register data RD Table 1, LB[4] (HB[5])							
		6	PD RA	F 0	Status 2 / Register RES Channel 2 / Table 2					
		7	Register data RD Table 2, HB[4] (LB[5])							
		8	Register data RD Table 2, LB[4] (HB[5])							
		9	PD RA	F 0	Status 3 / Register RES Channel 3 / Table 3					
		10	Register data RD Table 3, HB[4] (LB[5])							
		11	Register data RD Table 3, LB[4] (HB[5])							
	O	0	PD RA	0 RW	Control 0 / Register REQ Channel 0 / Table 0					
		1	Output data Channel 0, HB[4] (LB[5])				Register data RD Table 0, HB[4] (LB[5])			
		2	Output data Channel 0, LB[4] (HB[5])				Register data RD Table 0, LB[4] (HB[5])			
		3	PD RA	0 RW	Control 1 / Register REQ Channel 1 / Table 1					
		4	Output data Channel 1, HB[4] (LB[5])				Register data RD Table 1, HB[4] (LB[5])			
		5	Output data Channel 1, LB[4] (HB[5])				Register data RD Table 1, LB[4] (HB[5])			
		6	PD RA	0 RW	Control 2 / Register REQ Channel 2 / Table 2					
		7	Output data Channel 2, HB[4] (LB[5])				Register data RD Table 2, HB[4] (LB[5])			
		8	Output data Channel 2, LB[4] (HB[5])				Register data RD Table 2, LB[4] (HB[5])			
		9	PD RA	0 RW	Control 3 / Register REQ Channel 3 / Table 3					
		10	Output data Channel 3, HB[4] (LB[5])				Register data RD Table 3, HB[4] (LB[5])			
		11	Output data Channel 3, LB[4] (HB[5])				Register data RD Table 3, LB[4] (HB[5])			

[4] Format MOTOROLA
[5] Format INTEL

13.2.7 PI Configurations of the Up/Down Counters

The configuration modules of the up/down counters are divided into two module types:

Table 106: Up/down counters – Module types

PBDP module type	Description	Proxy I/O Modules
1CNT	Up/Down counter	75x-404, 75x-633
2CNT	2-channel up/down counter	75x-638

Up/down counters pass the counter status of the input channels to the DP master and receive information about setting the counter status. For the 75x-404, two output channels can also be switched via the control byte.
The following table lists the number of bytes reserved for the modules in the respective process image (PI).

Table 107: Up/down counters – Number of bytes

I/O Modules / PBDP module type	Proxy (PBDP module type)					
	Data length [Byte]		Configuration identifier		Data type	Inst.
	I	O	hex	dec		
1CNT	6	6	0xF2	242	UINT8[2], UINT32 (UINT8[2], UINT16[2])	1
2CNT	6	6	0xF2	242	UINT8, UINT16	2

The following table describes the process images of the individual up/down counter module types.

Table 108: Up/down counters – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
1CNT	I	0	PD RA	0	Status 0 / Register RES Channel 0 / Table 0					
		1								
		2	Counter value Byte 0^5 (Byte 3^5)					Register data RD Table 0, LB^5		
		3	Counter value Byte 1 (Byte 2^5)					Register data RD Table 0, HB^5		
		4	Counter value Byte 2 (Byte 1^5)					Register data RD Table 0, HB^4		
		5	Counter value Byte 3 (Byte 0^5)					Register data RD Table 0, LB^4		
	O	0	PD RA	0 RW	Control 0 / Register REQ Channel 0 / Table 0					
		1								
		2	Counter set value Byte 0 (Byte 3^5)					Register data WR Table 0, LB^5		
		3	Counter set value Byte 1 (Byte 2^5)					Register data WR Table 0, HB^5		
		4	Counter set value Byte 2 (Byte 1^5)					Register data WR Table 0, HB^4		
		5	Counter set value Byte 3 (Byte 0^5)					Register data WR Table 0, LB^4		

Table 108: Up/down counters – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
2CNT	**I**	0	**PD RA**	**0**	**Status 0 / Register RES Channel 0 / Table 0**					
		1	**Counter value 0 Byte 0[4] (Byte 1[5])**				**Register data RD Table 0, HB[4] (LB[5])**			
		2	**Counter value 0 Byte 1[4] (Byte 0[5])**				**Register data RD Table 0, LB[4] (HB[5])**			
		3	**PD RA**	**0**	**Status 1 / Register RES Channel 1 / Table 1**					
		4	**Counter value 1 Byte 0[4] (Byte 1[5])**				**Register data RD Table 1, HB[4] (LB[5])**			
		5	**Counter value 1 Byte 1[4] (Byte 0[5])**				**Register data RD Table 1, LB[4] (HB[5])**			
	O	0	**PD RA**	**0 RW**	**Control 0 / Register REQ Channel 0 / Table 0**					
		1	**Counter set value 0 Byte 0[4] (Byte 1[5])**				**Register data WR Table 0, HB[4] (LB[5])**			
		2	**Counter set value 0 Byte 1[4] (Byte 0[5])**				**Register data WR Table 0, LB[4] (HB[5])**			
		3	**PD RA**	**0 RW**	**Control 1 / Register REQ Channel 1 / Table 1**					
		4	**Counter set value 1 Byte 0[4] (Byte 1[5])**				**Register data WR Table 1, HB[4] (LB[5])**			
		5	**Counter set value 1 Byte 1[4] (Byte 0[5])**				**Register data WR Table 1, LB[4] (HB[5])**			

[4] Format MOTOROLA
[5] Format INTEL

13.2.8 PI Configurations of the 2-Channel Pulse Width Output Module

Only one configuration module is available for the 2-channel pulse width output module:

Table 109: 2-channel pulse width output module – Module types

PBDP module type	Description	Proxy I/O modules
PWM	2-channel pulse width output module	75x-511

The 2-channel pulse width output module outputs the pulse width set by the output process data to the peripheral at the respective frequency.
The following table lists the number of bytes reserved for the module in the respective process image (PI).

Table 110: 2-channel pulse width output module – Number of bytes

I/O Modules / PBDP module type	Proxy (PBDP module type)					
	Data length [Byte]		Configuration identifier		Data type	Inst.
	I	O	hex	dec		
PWM	6	6	0xF2	242	UINT8, UINT16	2

The following tables describe the process image of the module type for the 2-channel pulse width output module.

Table 111: Pulse width output module – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
PWM	I	0	PD RA	0	Status 0 / Register RES Channel 0 / Table 0					
		1	Input data Channel 0, HB[4] (LB[5])				Register data RD Table 0, HB[4] (LB[5])			
		2	Input data Channel 0, LB[4] (HB[5])				Register data RD Table 0, LB[4] (HB[5])			
		3	PD RA	0	Status 1 / Register RES Channel 1 / Table 1					
		4	Input data Channel 1, HB[4] (LB[5])				Register data RD Table 1, HB[4] (LB[5])			
		5	Input data Channel 1, LB[4] (HB[5])				Register data RD Table 1, LB[4] (HB[5])			
	O	0	PD RA	0 RW	Control 0 / Register REQ Channel 0 / Table 0					
		1	Output data Channel 0, HB[4] (LB[5])				Register data WR Table 0, HB[4] (LB[5])			
		2	Output data Channel 0, LB[4] (HB[5])				Register data WR Table 0, LB[4] (HB[5])			
		3	PD RA	0 RW	Control 1 / Register REQ Channel 1 / Table 1					
		4	Output data Channel 1, HB[4] (LB[5])				Register data WR Table 1, HB[4] (LB[5])			
		5	Output data Channel 1, LB[4] (HB[5])				Register data WR Table 1, LB[4] (HB[5])			

[4] Format MOTOROLA
[5] Format INTEL

13.2.9 PI Configurations of the Modules for Path and Angle Measurement

The configuration modules for the path and angle measurement are divided into four module types:

Table 112: Modules for path and angle measurement – Module types

PBDP module type	Description	Proxy I/O modules
SSI	SSI Encoder Interface, channel diagnostics, 32 bit input data	75x-630
SSI_RA	SSI Encoder Interface, channel diagnostics 32 bit input and output data plus control and status byte, access to the register structure via cyclic data exchange	75x-630
ENC_RA	Incremental Encoder Interface, channel diagnostics [1], 32 bit input and output data plus control and status byte, access to the register structure via cyclic data exchange	75x-631, 75x-634, 75x-637
DII_RA	Digital Impulse Interface, channel diagnostics, 24 bit input and output data plus control and status byte, access to the register structure via cyclic data exchange	75x-635

[1] Only valid for 75x-637

The modules for path and angle measurement pass the serial position data and optional diagnostic information to the DP master.
The following table lists the number of bytes reserved for the individual module in the respective process image (PI).

Table 113: Modules for path and angle measurement – Number of bytes

I/O Modules / PBDP module type	Proxy (PBDP module type)					
	Data length [Byte]		Configuration identifier		Data type	Inst.
	I	O	hex	dec		
SSI	4	0	0x93	147	UINT32	1
SSI_RA	6	6	0xF2	242	UINT8[2], UINT32	1
ENC_RA	6	6	0xB5	181	UINT8, UINT16	1(2)
DII_RA	4	4	0xB3	179	UINT8, UINT8[3]	1

The following table describes the process image information of the individual module types for path and angle measurement.

Table 114: Modules for path and angle measurement – Process data information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
SSI	**I**	0	**Input data Byte 3^4 (Byte 0^5)**							
		1	**Input data Byte 2^4 (Byte 1^5)**							
		2	**Input data Byte 1^4 (Byte 2^5)**							
		3	**Input data Byte 0^4 (Byte 3^5)**							
SSI_RA	**I**	0	**PD RA**	**F 0**	**Status 0 / Register RES Channel 0 / Table 0**					
		1								
		2	**Input data Byte 3^4 (Byte 0^5)**				**Register data RD Table 0, LB^5**			
		3	**Input data Byte 2^4 (Byte 1^5)**				**Register data RD Table 0, HB^5**			
		4	**Input data Byte 1^4 (Byte 2^5)**				**Register data RD Table 0, HB^4**			
		5	**Input data Byte 0^4 (Byte 3^5)**				**Register data RD Table 0, LB^4**			
	O	0	**PD RA**	**0 RW**	**Control 0 / Register REQ Channel 0 / Table 0**					
		1								
		2	**Register data WR Table 0, LB^5**							
		3	**Register data WR Table 0, HB^5**							
		4	**Register data WR Table 0, HB^4**							
		5	**Register data WR Table 0, LB^4**							

Table 114: Modules for path and angle measurement – Process data information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
ENC_RA	I	0	PD RA	F 0	Status 0 / Register RES Channel 0 / Table 0					
		1	Input data Byte 1[4] (Byte 0[5])						Register data RD Table 0, HB[4] (LB[5])	
		2	Input data Byte 0[4] (Byte 1[5])						Register data RD Table 0, LB[4] (HB[5])	
		3	Status 1							
		4	Input data Byte 3[4] (Byte 2[5])							
		5	Input data Byte 2[4] (Byte 3[5])							
	O	0	PD RA	0 RW	Control 0 / Register REQ Channel 0 / Table 0					
		1	Output data Byte 1[4] (Byte 0[5])						Register data WR Table 0, HB[4] (LB[5])	
		2	Output data Byte 0[4] (Byte 1[5])						Register data WR Table 0, LB[4] (HB[5])	
		3	Control 1							
		4	Output data Byte 3[4] (Byte 2[5])							
		5	Output data Byte 2[4] (Byte 3[5])							
DII_RA	I	0	PD RA	F 0	Status 0 / Register RES Channel 0 / Table 0					
		1	Input data Byte 0						Register data RD Table 0, LB	
		2	Register data Byte 1						Register data RD Table 0, HB	
		3	Input data Byte 2							
	O	0	PD RA	0 RW	Control 0 / Register REQ Channel 0 / Table 0					
		1	Output data Byte 0						Register data WR Table 0, LB	
		2	Output data Byte 1						Register data WR Table 0, HB	
		3	Output data Byte 3							

[4] Format MOTOROLA
[5] Format INTEL

13.2.10 PI Configurations of the Serial Interfaces

The configuration modules of the serial interfaces are divided into seven module types:

Table 115: Serial interfaces – Module types

PBDP module type	Description	Proxy I/O modules
SER_3D	Serial Interface, channel diagnostics Control and status byte, 3 byte transmit / receive data	75x-650, 75x-651, 75x-653
SER_5D	Serial Interface, channel diagnostics Control and status byte, 5 byte transmit / receive data, access to the register structure via cyclic data exchange	75x-650, 75x-651, 75x-653
SER_6D	Serial Interface, channel diagnostics Control and status word, 6 byte transmit / receive data, access to the register structure via cyclic data exchange	75x-652
SER_22D	Serial Interface, channel diagnostics Control and status word, 22 byte transmit / receive data, access to the register structure via cyclic data exchange	75x-652
SER_46D	Serial Interface, channel diagnostics Control and status word, 46 byte transmit / receive data, access to the register structure via cyclic data exchange	75x-652
DXCH	Data Exchange Module 4 byte transmit / receive data,	75x-654
DXCH_RA	Data Exchange Module Control and status byte, 5 byte transmit / receive data access to the register structure via cyclic data exchange	75x-654

The serial interface modules pass information received from the respective receiver and make it possible to send information to the communication partner. The following table lists the number of bytes reserved for the individual module in the respective process image (PI).

Table 116: Serial interfaces – Number of bytes

I/O Modules / PBDP module type	Proxy (PBDP module type)					
	Data length [Byte]		Configuration identifier		Data type	Inst.
	I	O	hex	dec		
SER_3D	4	4	0xB3	179	UINT8, UINT8[3]	1
SER_5D	6	6	0xB5	181	UINT8, UINT8[5]	1
SER_6D	8	8	0xB7	183	UINT8[2], UINT8[6]	1
SER_22D	24	24	0xC2, 0x97, 0x97, 0x0A, 0x0A	194, 151, 151, 10, 10	UINT8[2], UINT8[22]	1
SER_46D	48	48	0xC2, 0xAF, 0xAF, 0x0A, 0x0A	194, 175, 175, 10, 10	UINT8[2], UINT8[46]	1
DXCH	4	4	0xF1	241	UINT8[4]	1
DXCH_RA	6	6	0xF2	242	UINT8, UINT8[5]	1

The following table describes the process image information of the individual module types for serial interfaces.

Table 117: Serial interface modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
SER_3D	I	0	PD RA	F 0	Status 0 / Register RES Channel 0 / Table 0					
		1	Receive data Byte 0				Register data RD Table 0, LB			
		2	Receive data Byte 1				Register data RD Table 0, HB			
		3	Receive data Byte 2							
	O	0	PD RA	0 RW	Control 0 / Register REQ Channel 0 / Table 0					
		1	Transmit data Byte 0				Register data WR Table 0, LB			
		2	Transmit data Byte 1				Register data WR Table 0, HB			
		3	Transmit data Byte 2							
SER_5D	I	0	PD RA	F 0	Status 0 / Register RES Channel 0 / Table 0					
		1	Receive data Byte 0				Register data RD Table 0, LB			
		2	Receive data Byte 1				Register data RD Table 0, HB			
		3	Receive data Byte 2							
		4	Receive data Byte 3							
		5	Receive data Byte 4							
	O	0	PD RA	0 RW	Control 0 / Register REQ Channel 0 / Table 0					
		1	Transmit data Byte 0				Register data WR Table 0, LB			
		2	Transmit data Byte 1				Register data WR Table 0, HB			
		3	Transmit data Byte 2							
		4	Transmit data Byte 3							
		5	Transmit data Byte 4							

Table 117: Serial interface modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
SER_6D	**I**	0	**PD RA**	**F 0**	**Status 0 / Register RES Channel 0 / Table 0**					
		1	**Status 1**					**Register data RD Table 0, LB**		
		2	**Receive data Byte 0**					**Register data RD Table 0, HB**		
		3	**Receive data Byte 1**							
		4	**Receive data Byte 2**							
		5	**Receive data Byte 3**							
		6	**Receive data Byte 4**							
		7	**Receive data Byte 5**							
	O	0	**PD RA**	**0 RW**	**Control 0 / Register REQ Channel 0 / Table 0**					
		1	**Control 1**					**Register data WR Table 0, LB**		
		2	**Transmit data Byte 0**					**Register data WR Table 0, HB**		
		3	**Transmit data Byte 1**							
		4	**Transmit data Byte 2**							
		5	**Transmit data Byte 3**							
		6	**Transmit data Byte 4**							
		7	**Transmit data Byte 5**							
SER_22D	**I**	0	**PD RA**	**F 0**	**Status 0 / Register RES Channel 0 / Table 0**					
		1	**Status 1**					**Register data RD Table 0, LB**		
		2	**Receive data Byte 0**					**Register data RD Table 0, HB**		
		3	**Receive data Byte 1**							
		4	**Receive data Byte 2**							
		5	**Receive data Byte 3**							
		…	**…**							
		23	**Receive data Byte 21**							
	O	0	**PD RA**	**0 RW**	**Control 0 / Register REQ Channel 0 / Table 0**					
		1	**Control 1**					**Register data WR Table 0, LB**		
		2	**Transmit data Byte 0**					**Register data WR Table 0, HB**		
		3	**Transmit data Byte 1**							
		4	**Transmit data Byte 2**							
		5	**Transmit data Byte 3**							
		…	**…**							
		23	**Transmit data Byte 21**							

Table 117: Serial interface modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
SER_46D	I	0	PD RA	F 0	Status 0 / Register RES Channel 0 / Table 0					
		1	Status 1				Register data RD Table 0, LB			
		2	Receive data Byte 0				Register data RD Table 0, HB			
		3	Receive data Byte 1							
		4	Receive data Byte 2							
		5	Receive data Byte 3							
		…	…							
		47	Receive data Byte 45							
	O	0	PD RA	0 RW	Control 0 / Register REQ Channel 0 / Table 0					
		1	Control 1				Register data WR Table 0, LB			
		2	Transmit data Byte 0				Register data WR Table 0, HB			
		3	Transmit data Byte 1							
		4	Transmit data Byte 2							
		5	Transmit data Byte 3							
		…	…							
		47	Transmit data Byte 45							
DXCH	I	1	Receive data Byte 0							
		2	Receive data Byte 1							
		3	Receive data Byte 2							
		4	Receive data Byte 3							
	O	1	Transmit data Byte 0							
		2	Transmit data Byte 1							
		3	Transmit data Byte 2							
		4	Transmit data Byte 3							

Table 117: Serial interface modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
DXCH_RA	I	0	PD RA	F 0	Status 0 / Register RES Channel 0 / Table 0					
		1	Receive data Byte 0				Register data RD Table 0, LB			
		2	Receive data Byte 1				Register data RD Table 0, HB			
		3	Receive data Byte 2							
		4	Receive data Byte 3							
		5	Receive data Byte 4							
	O	0	PD RA	0 RW	Control 0 / Register REQ Channel 0 / Table 0					
		1	Transmit data Byte 0				Register data WR Table 0, LB			
		2	Transmit data Byte 1				Register data WR Table 0, HB			
		3	Transmit data Byte 2							
		4	Transmit data Byte 3							
		5	Transmit data Byte 4							

13.2.11 PI Configurations of the DALI/DSI Master Module

Only one configuration module is available for the DALI/DSI module

Table 118: DALI/DSI master module – module types

PBDP module type	Description	Proxy I/O modules
DALI	DALI-/DSI Master Module, module diagnostics, control and status byte, 5 byte transmit / receive data, access to the register structure via cyclic data exchange	75x-641

The DALI/DSI master module is used to trigger lighting actuators digitally, e.g. electronic ballasts (EBs), in building automation.
The following table lists the number of bytes reserved for the module in the respective process image (PI).

Table 119: DALI/DSI master module – Number of bytes

I/O Modules / PBDP module type	Proxy (PBDP module type)					
	Data length [Byte]		Configuration identifier		Data type	Inst.
	I	O	hex	dec		
DALI	6	6	0xB5	181	UINT8, UINT8[5]	1

The following table describes the process image information of the module type for the DALI/DSI master module.

Table 120: DALI/DSI master module – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
DALI	**I**	0	**PD RA**	**F 0**	**Status 0 / Register RES Channel 0 / Table 0**					
		1	**Receive data Byte 0**				**Register data RD Table 0, LB**			
		2	**Receive data Byte 1**				**Register data RD Table 0, HB**			
		3	**Receive data Byte 2**							
		4	**Receive data Byte 3**							
		5	**Receive data Byte 4**							
	O	0	**PD RA**	**0 RW**	**Control 0 / Register REQ Channel 0 / Table 0**					
		1	**Transmit data Byte 0**				**Register data WR Table 0, LB**			
		2	**Transmit data Byte 1**				**Register data WR Table 0, HB**			
		3	**Transmit data Byte 2**							
		4	**Transmit data Byte 3**							
		5	**Transmit data Byte 4**							

13.2.12 PI Configurations of the AS Interface Master

There are six configuration modules for the AS interface master:

Table 121: AS interface master module – Module types

PBDP module type	Description	Proxy I/O modules
ASI_10D	AS Interface Master, module diagnostics, control/status byte, mailbox, up to 10 byte user data to connect up to 19 ASi slaves	75x-655
ASI_18D	AS Interface Master, module diagnostics, control/status byte, mailbox, up to 18 byte user data to connect up to 34 ASi slaves	75x-655
ASI_22D	AS Interface Master, module diagnostics, control/status byte, mailbox, up to 22 byte user data to connect up to 42 ASi slaves	75x-655
ASI_30D	AS Interface Master, module diagnostics, control/status byte, mailbox, up to 30 byte user data to connect up to 58 ASi slaves	75x-655
ASI_38D	AS Interface Master, module diagnostics, control/status byte, mailbox, up to 38 byte user data to connect up to 62 ASi slaves	75x-655
ASI_46D	AS Interface Master, module diagnostics, control/status byte, mailbox, up to 46 byte user data to connect up to 62 ASi slaves	75x-655

The AS interface master exchanges input and output data with the attached ASi slaves. In addition, digitalized information from analog input and output channels, as well as various lists can be sent and received via the optional mailbox. The following table lists the number of bytes reserved for the individual module in the respective process image (PI).

Table 122: AS interface master – Number of bytes

I/O Modules / PBDP module type	Proxy (PBDP module type)					
	Data length [Byte]		Configuration identifier		Data type	Inst.
	I	O	hex	dec		
ASI_10D	12	12	0xC2, 0x8B, 0x8B, 0x0A, 0x0A	194, 139, 139, 10, 10	UINT8[2], UINT8[10]	1
ASI_18D	20	20	0xC2, 0x93, 0x93, 0x0A, 0x0A	194, 147, 147, 10, 10	UINT8[2], UINT8[18]	1
ASI_22D	24	24	0xC2, 0x97, 0x97, 0x0A, 0x0A	194, 151, 151, 10, 10	UINT8[2], UINT8[22]	1
ASI_30D	32	32	0xC2, 0x9F, 0x9F, 0x0A, 0x0A	194, 159, 159, 10, 10	UINT8[2], UINT8[30]	1
ASI_38D	40	40	0xC2, 0xA7, 0xA7, 0x0A, 0x0A	194, 167, 167, 10, 10	UINT8[2], UINT8[38]	1
ASI_46D	48	48	0xC2, 0xAF, 0xAF, 0x0A, 0x0A	194, 175, 175, 10, 10	UINT8[2], UINT8[46]	1

The following table describes the process image information, e.g., allocation of configuration modules, for the AS interface master module. All other possible process image assignments are available in the AS interface master module manual.

Table 123: AS interface master module – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
ASI_10D	I	0	PD RA	F 0	Status 0 / Register RES Channel 0 / Table 0					
		1								
		2	Receive data Mailbox Byte 0				Register data RD Table 0, LB			
		3	Receive data Mailbox Byte 1				Register data RD Table 0, HB			
		4	Receive data Mailbox Byte 2							
		5	Receive data Mailbox Byte 3							
		6	Receive data Mailbox Byte 4							
		7	Receive data Mailbox Byte 5							
		8	Input data ASi-Master Flags				Input data ASi-Slave 1/1A			
		9	Input data ASi-Slave 2/2A				Input data ASi-Slave 3/3A			
		10	Input data ASi-Slave 4/4A				Input data ASi-Slave 5/5A			
		11	Input data ASi-Slave 6/6A				Input data ASi-Slave 7/7A			
ASI_18D		…	…				…			
		19	Input data ASi-Slave 22/22A				Input data ASi-Slave 23/23A			
ASI_22D		…	…				…			
		23	Input data ASi-Slave 30/30A				Input data ASi-Slave 31/31A			
ASI_30D		…	…				…			
		31	Input data ASi-Slave 14B				Input data ASi-Slave 15B			
ASI_38D		…	…				…			
		39	Input data ASi-Slave 30B				Input data ASi-Slave 31B			
ASI_46D		…	…				…			
		47	Input data ---				Input data ---			

Table 123: AS interface master module – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
ASI_10D	O	0	PD RA	0 RW	Control 0 / Register REQ Channel 0 / Table 0					
		1								
		2	Transmit data Mailbox Byte 0				Register data WR Table 0, LB			
		3	Transmit data Mailbox Byte 1				Register data WR Table 0, HB			
		4	Transmit data Mailbox Byte 2							
		5	Transmit data Mailbox Byte 3							
		6	Transmit data Mailbox Byte 4							
		7	Transmit data Mailbox Byte 5							
		8	Output data ASi-Master Flags				Output data ASi-Slave 1/1A			
		9	Output data ASi-Slave 2/2A				Output data ASi-Slave 3/3A			
		10	Output data ASi-Slave 4/4A				Output data ASi-Slave 5/5A			
		11	Output data ASi-Slave 6/6A				Output data ASi-Slave 7/7A			
ASI_18D		…	…							
		19	Output data ASi-Slave 22/22A				Output data ASi-Slave 23/23A			
ASI_22D		…	…							
		23	Output data ASi-Slave 30/30A				Output data ASi-Slave 31/31A			
ASI_30D		…	…							
		31	Output data ASi-Slave 14B				Output data ASi-Slave 15B			
ASI_38D		…	…							
		39	Output data ASi-Slave 30B				Output data ASi-Slave 31B			
ASI_46D		…	…							
		47	Output data ---				Output data ---			

13.2.13 PI Configurations of the Radio Receiver I/O Modules

There are four configuration modules for the radio receiver I/O modules:

Table 124: Radio receiver I/O modules – Module types

PBDP module type	Description	Proxy I/O modules
ENOC	Radio Receiver EnOcean, module diagnostics	75x-642
BT_10D	*Bluetooth*® RF Transceiver, module diagnostics Control/status byte, mailbox, up to 10 byte user data	75x-644
BT_22D	*Bluetooth*® RF Transceiver, module diagnostics Control/status byte, mailbox, up to 22 byte user data	75x-644
BT_46D	*Bluetooth*® RF Transceiver, module diagnostics Control/status byte, mailbox, up to 46 byte user data	75x-644

The *Bluetooth*® RF transceiver exchanges input and output information from other *Bluetooth*® RF transceivers with the DP master.
The following table lists the number of bytes reserved for the individual module in the respective process image (PI).

Table 125: Radio receiver I/O modules – Number of bytes

I/O Modules / PBDP module type	Proxy (PBDP module type)					
	Data length [Byte]		Configuration identifier		Data type	Inst.
	I	O	hex	dec		
ENOC	4	4	0xB3	179	UINT8, UINT8[3]	1
BT_10D	12	12	0xC2, 0x8B, 0x8B, 0x0A, 0x0A	194, 139, 139, 10, 10	UINT8[2], UINT8[10]	1
BT_22D	24	24	0xC2, 0x97, 0x97, 0x0A, 0x0A	194, 151, 151, 10, 10	UINT8[2], UINT8[22]	1
BT_46D	48	48	0xC2, 0xAF, 0xAF, 0x0A, 0x0A	194, 175, 175, 10, 10	UINT8[2], UINT8[46]	1

The following table describes the process image information, e.g., allocation of configuration modules, for the radio receiver I/O modules. All other possible process image assignments are available in the radio receiver I/O module manuals.

Table 126: Radio receiver I/O modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
ENOC	I	0	PD RA	F 0	Status 0 / Register RES Channel 0 / Table 0					
		1	Receive data Byte 0				Register data RD Table 0, LB			
		2	Receive data Byte 1				Register data RD Table 0, HB			
		3	Receive data Byte 2							
	O	0	PD RA	0 RW	Control 0 / Register REQ Channel 0 / Table 0					
		1	Transmit data Byte 0				Register data WR Table 0, LB			
		2	Transmit data Byte 1				Register data WR Table 0, HB			
		3	Transmit data Byte 3							
BT_10D	I	0	PD RA	F 0	Status 0 / Register RES Channel 0 / Table 0					
		1								
		2	Input data Byte 0			Receive data Mailbox Byte 0			Register data RD Table 0, LB	
		3	Input data Byte 1			Receive data Mailbox Byte 1			Register data RD Table 0, HB	
		4	Input data Byte 2				Receive data Mailbox Byte 2			
		5	Input data Byte 3				Receive data Mailbox Byte 3			
		6	Input data Byte 4				Receive data Mailbox Byte 4			
		7	Input data Byte 5				Receive data Mailbox Byte 5			
		8	Input data Byte 6							
		9	Input data Byte 7							
		10	Input data Byte 8							
		11	Input data Byte 9							
BT_22D		…	…							
		23	Input data Byte 21							
BT_46D		…	…							
		47	Input data Byte 45							

Table 126: Radio receiver I/O modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
BT_10D	**O**	0	**PD RA**	**0 RW**	**Control 0 / Register REQ Channel 0 / Table 0**					
		1								
		2	**Output data Byte 0**			**Transmit data Mailbox Byte 0**			**Register data WR Table 0, LB**	
		3	**Output data Byte 1**			**Transmit data Mailbox Byte 1**			**Register data WR Table 0, HB**	
		4	**Output data Byte 2**				**Transmit data Mailbox Byte 2**			
		5	**Output data Byte 3**				**Transmit data Mailbox Byte 3**			
		6	**Output data Byte 4**				**Transmit data Mailbox Byte 4**			
		7	**Output data Byte 5**				**Transmit data Mailbox Byte 5**			
		8	**Output data Byte 6**							
		9	**Output data Byte 7**							
		10	**Output data Byte 8**							
		11	**Output data Byte 9**							
BT_22D		…	**…**							
		23	**Output data Byte 21**							
BT_46D		…	**…**							
		47	**Output data Byte 45**							

13.2.14 PI Configurations of the MP Bus Master Module

Only one configuration module is available for the MP bus module:

Table 127: MP bus master module – Module types

PBDP module type	Description	Proxy I/O modules
MP_Bus	MP Bus Master Module, module diagnostics, 2 control and status bytes, 6 byte transmit / receive data, access to the register structure via cyclic data exchange	75x-643

The MP bus master module works as a master for the MP bus and allows integration of the MP bus in fieldbus systems.
The following table lists the number of bytes reserved for the module in the respective process image (PI).

Table 128: MP bus master module – Number of bytes

I/O Modules / PBDP module type	Proxy (PBDP module type)					
	Data length [Byte]		Configuration identifier		Data type	Inst.
	I	O	hex	dec		
MP_Bus	8	8	0xB7	183	UINT8[2], UINT8[6]	1

The following table describes the process image information of the module type for the MP bus master module.

Table 129: MP bus master module – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^6	2^4	2^3	2^2	2^1	2^0
MP_Bus	**I**	0	**PD RA**	**F 0**	**Status 0 / Register RES Channel 0 / Table 0**					
		1	**Status 1**				**Register data RD Table 0, LB**			
		2	**Receive data Byte 0**				**Register data RD Table 0, HB**			
		3	**Receive data Byte 1**							
		4	**Receive data Byte 2**							
		5	**Receive data Byte 3**							
		6	**Receive data Byte 4**							
		7	**Receive data Byte 5**							
	O	0	**PD RA**	**0 RW**	**Control 0 / Register REQ Channel 0 / Table 0**					
		1	**Control 1**				**Register data WR Table 0, LB**			
		2	**Transmit data Byte 0**				**Register data WR Table 0, HB**			
		3	**Transmit data Byte 1**							
		4	**Transmit data Byte 2**							
		5	**Transmit data Byte 3**							
		6	**Transmit data Byte 4**							
		7	**Transmit data Byte 5**							

13.2.15 PI Configurations of the Vibration Monitoring

Only one configuration module is available for the vibration monitoring.

Table 130: Vibration monitoring – Module types

Configuration module	Description	Proxy I/O modules
VIB_IO	2-Channel Vibration Velocity/Bearing Condition Monitoring VIB I/O	75x-645

The VIB I/O module is used in the online-monitoring of machine vibration. It records the two most important parameters required for the condition analysis: vibration severity and roller bearing condition.
The following table lists the number of bytes reserved for the module in the respective process image (PI).

Table 131: Vibration monitoring – Number of bytes

I/O Modules / PBDP module type	Proxy (PBDP module type)					
	Data length [Byte]		Configuration identifier		Data type	Inst.
	I	O	hex	dec		
VIB_IO	12	12	0xF5	245	UINT8, UINT16 (UINT8, UINT8[2])	2(2)

The following table describes the process image information of the module type for the vibration monitoring module.

Table 132: Vibration monitoring – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
VIB_IO	I	0	PD RA	F 0	Status 0 / Register RES Channel 0 / Table 0					
		1	RMS Vibration severity Channel 0, HB[4] (LB[5])				Register data RD Table 0, HB[4] (LB[5])			
		2	RMS Vibration severity Channel 0, LB[4] (HB[5])				Register data RD Table 0, LB[4] (HB[5])			
		3	PD RA	F 0	Status 1 / Register RES Channel 1 / Table 1					
		4	RMS Vibration severity Channel 1, HB[4] (LB[5])				Register data RD Table 1, HB[4] (LB[5])			
		5	RMS Vibration severity Channel 1, LB[4] (HB[5])				Register data RD Table 1, LB[4] (HB[5])			
		6	PD RA	0 RW	Status 2 / Register RES Channel 2 / Table 2					
		7	SPM Channel 0, Carpet[4] (Peak[5])				Register data RD Table 2, HB[4] (LB[5])			
		8	SPM Channel 0, Peak[4] (Carpet[5])				Register data RD Table 2, LB[4] (HB[5])			
		9	PD RA	0 RW	Status 3 / Register RES Channel 3 / Table 3					
		10	SPM Channel 1, Carpet[4] (Peak[5])				Register data RD Table 3, HB[4] (LB[5])			
		11	SPM Channel 1, Peak[4] (Carpet[5])				Register data RD Table 3, LB[4] (HB[5])			
	O	0	PD RA	0 RW	Control 0 / Register REQ Channel 0 / Table 0					
		1	Register data WR Table 0, HB[4] (LB[5])							
		2	Register data WR Table 0, LB[4] (HB[5])							
		3	PD RA	0 RW	Control 1 / Register REQ Channel 1 / Table 1					
		4	Register data WR Table 1, HB[4] (LB[5])							
		5	Register data WR Table 1, LB[4] (HB[5])							
		6	PD RA	0 RW	Control 2 / Register REQ Channel 2 / Table 2					
		7	Register data WR Table 2, HB[4] (LB[5])							
		8	Register data WR Table 2, LB[4] (HB[5])							
		9	PD RA	0 RW	Control 3 / Register REQ Channel 3 / Table 3					
		10	Register data WR Table 3, HB[4] (LB[5])							
		11	Register data WR Table 3, LB[4] (HB[5])							

[4] Format MOTOROLA
[5] Format INTEL

13.2.16 PI Configurations of the PROFIsafe Modules

Configuration modules of the safety modules
PROFIsafe modules are divided into two module types:

Table 133: PROFIsafe modules – Module types

PBDP module type	Description	Proxy I/O modules
PSAFE	PROFIsafe Modules, module and channel diagnostics	750-660/000-001, 750-665/000-001, 753-662/000-002, 753-667/000-002, 75x-661/000-003, 75x-662/000-003, 75x-667/000-003
PSAFE_iPar	PROFIsafe Modules, module and channel diagnostics, iPar server mechanism can be used	75x-661/000-003, 75x-662/000-003, 75x-666/000-003, 75x-667/000-003

The PROFIsafe modules exchange fail-safe input and/or output data with the assigned F-Host of the main controller. The following table lists the number of bytes reserved for the individual module in the respective process image (PI). The first byte in the respecting range contains the actual fail-safe data. The four other bytes serve to transmit control and status information between F-Host and F-Slave, as well as to store the data to be transferred.
The following table lists the number of bytes reserved for the module in the respective process image (PI).

Table 134: PROFIsafe modules – Number of bytes

I/O Modules / PBDP module type	Proxy (PBDP module type)					
	Data length [Byte]		Configuration identifier		Data type	Inst.
	I	O	hex	dec		
PSAFE **PSAFE_iPar**	5	5	0xC4, 0x84, 0x84, 0x05, 0x6E, 0x05, 0x6E	196, 132, 132, 5, 110, 5, 110	UINT8, UINT8[4]	1

The following table describes the process image information of the individual module types for the PROFIsafe modules.

Table 135: PROFIsafe modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
P_SAFE, P_SAFE_iPar	**I**	0	**I7[1)]**	**I6[1)]**	**I5[1)]**	**I4[1)]**	**I3**	**I2**	**I1**	**I0**
		1	**F-Status**							
		2	**F-Device-CRC[2)] Byte 2**				**Consecutive number [3)] F-Device**			
		3	**F-Device-CRC Byte 1**							
		4	**F-Device-CRC Byte 0**							
	O	0	**RES**	**RES**	**RES**	**RES**	**O3[4)]**	**O2[4)]**	**O1[4)]**	**O0[4)]**
		1	**F-Control**							
		2	**F-Host-CRC[2)] Byte 2**				**Consecutive number[3)] F-Host**			
		3	**F-Host-CRC Byte 1**							
		4	**F-Host-CRC Byte 0**							

[1)] Only available with 8-Channel F-Input modules
[2)] In PROFIsafe V2 mode
[3)] In PROFIsafe V1 mode
[4)] Only available with 4-Channel F-Output module

13.2.17 PI Configuration of the RTC Module

Only one configuration module is available for the RTC module:

Table 136: RTC module – Module types

PBDP module type	Description	Proxy I/O modules
RTC	RTC-Module	75x-640

The RTC module passes the current time to the DP master. The time is buffered and continues to run in the event of a power failure.
The following table lists the number of bytes reserved for the module in the respective process image (PI).

Table 137: RTC module – Number of bytes

I/O Modules / PBDP module type	Proxy (PBDP module type)					
	Data length [Byte]		Configuration identifier		Data type	Inst.
	I	O	hex	dec		
RTC	6	6	0xB5	181	UINT8, UINT8[5]	1

The following table describes the process image information of the module type for the RTC module.

Table 138: RTC module – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
RTC	**I**	0	**PD RA**	**0**	**Status 0 / Register RES Channel 0 / Table 0**					
		1	**Opcode**				**Register data RD Table 0, LB**			
		2	**Request Parameters Byte 0**				**Register data RD Table 0, HB**			
		3	**Request Parameters Byte 1**							
		4	**Request Parameters Byte 2**							
		5	**Request Parameters Byte 3**							
	O	0	**PD RA**	**0 RW**	**Control 0 / Register REQ Channel 0 / Table 0**					
		1	**Opcode (mirrored)**				**Register data WR Table 0, LB**			
		2	**Response parameters Byte 0**				**Register data WR Table 0, HB**			
		3	**Response parameters Byte 1**							
		4	**Response parameters Byte 2**							
		5	**Response parameters Byte 3**							

13.2.18 PI Configurations of the Stepper Module

Only one configuration module is available for the stepper module:

Table 139: Stepper module – Module types

PBDP module type	Description	Proxy I/O modules
STEPPER	Stepper Controller, Stepper Servo	75x-670, 75x-671, 750-672, 750-673

The stepper controller is used to control different drive power sections with pulse/direction interface or incremental encoder input. RS-422 and 24V or 20 mA interfaces can be used.
The stepper servo has its own power stage and incremental encoder evaluation for controlling 2-phase stepper motors.
The following table lists the number of bytes reserved for the module in the respective process image (PI).

Table 140: Stepper module – Stepper module

I/O Modules / PBDP module type	Proxy (PBDP module type)					
	Data length [Byte]		Configuration identifier		Data type	Inst.
	I	O	hex	dec		
STEPPER	12	12	0xC2, 0x8B, 0x8B, 0x0A, 0x0A	194, 139, 139, 10, 10	UINT8[2], UINT8[7], UINT8[3]	1

The following table describes the process image information of the module type for the stepper module.

Table 141: Stepper module – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
STEPPER	I	0	PD RA	F 0	Status 0 / Register RES Channel 0 / Table 0					
		1								
		2	Input data Byte 0			Receive data Mailbox Byte 0			Register data RD Table 0, LB	
		3	Input data Byte 1			Receive data Mailbox Byte 1			Register data RD Table 0, HB	
		4	Input data Byte 2					Receive data Mailbox Byte 2		
		5	Input data Byte 3					Receive data Mailbox Byte 3		
		6	Input data Byte 4					Receive data Mailbox Byte 4		
		7	Input data Byte 5					Receive data Mailbox Byte 5		
		8	Input data Byte 6					reserved		
		9	Status 3							
		10	Status 2							
		11	Status 1							
	O	0	PD RA	0 RW	Control 0 / Register REQ Channel 0 / Table 0					
		1								
		2	Output data Byte 0			Transmit data Mailbox Byte 0			Register data WR Table 0, LB	
		3	Output data Byte 1			Transmit data Mailbox Byte 1			Register data WR Table 0, HB	
		4	Output data Byte 2					Transmit data Mailbox Byte 2		
		5	Output data Byte 3					Transmit data Mailbox Byte 3		
		6	Output data Byte 4					Transmit data Mailbox Byte 4		
		7	Output data Byte 5					Transmit data Mailbox Byte 5		
		8	Output data Byte 6					reserved		
		9	Control 3							
		10	Control 2							
		11	Control 1							

13.2.19 PI Configurations of the DC Drive Controller

Only one configuration module is available for the DC drive controller:

Table 142: DC drive controller – Module types

PBDP module type	Description	Proxy I/O modules
DC_DRIVE	DC Drive Controller	75x-636

The DC drive controller is used for controlled positioning of direct current collector motors. It can be used as a simple power controller and to simply detect incremental encoder signals.
The following table lists the number of bytes reserved for the module in the respective process image (PI).

Table 143: DC drive controller – Number of bytes

I/O Modules / PBDP module type	Proxy (PBDP module type)					
	Data length [Byte]		Configuration identifier		Data type	Inst.
	I	O	hex	dec		
DC_DRIVE	6	6	0xF2	242	UINT8[2], UINT32	1

The following table describes the process image information of the module type for the DC drive controller.

Table 144: DC drive controller – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
DC_DRIVE	I	0	PD RA	F 0	Status 0 / Register RES Channel 0 / Table 0					
		1	Status 1				Register data RD Table 0, LB			
		2	Actual position Byte 0		Status 2			Register data RD Table 0, HB		
		3	Actual position Byte 1				Status 3			
		4	Actual position Byte 2				Status 4			
		5	Actual position Byte 3				Status 5			
	O	0	PD RA	0 RW	Control 0 / Register REQ Channel 0 / Table 0					
		1	Control 1				Register data RD Table 0, LB			
		2	Setpoint position Byte 0				Register data RD Table 0, HB			
		3	Setpoint position Byte 1							
		4	Setpoint position Byte 2							
		5	Setpoint position Byte 3							

13.2.20 PI Configurations of the IO-Link Master

The PI configurations of the IO-Link master are divided into eight module types:

Table 145: IO-Link master – Module types

PBDP module type	Description	Proxy I/O modules
IOL_SIO	IO-Link Master, module and port diagnostics, Status byte, SIO byte	75x-657
IOL_SIO_02D	IO-Link Master, module and port diagnostics, Status byte, SIO byte, 2 byte input/output data for the 4 IO-Link ports	75x-657
IOL_SIO_04D	IO-Link Master, module and port diagnostics, Status byte, SIO byte, 4 byte input/output data for the 4 IO-Link ports	75x-657
IOL_SIO_06D	IO-Link Master, module and port diagnostics, Status byte, SIO byte, 6 byte input/output data for the 4 IO-Link ports	75x-657
IOL_SIO_08D	IO-Link Master, module and port diagnostics, Status byte, SIO byte, 8 byte input/output data for the 4 IO-Link ports	75x-657
IOL_SIO_12D	IO-Link Master, module and port diagnostics, Status byte, SIO byte, 12 byte input/output data for the 4 IO-Link ports	75x-657
IOL_SIO_16D	IO-Link Master, module and port diagnostics, Status byte, SIO byte, 16 byte input/output data for the 4 IO-Link ports	75x-657
IOL_SIO_20D	IO-Link Master, module and port diagnostics, Status byte, SIO byte, 20 byte input/output data for the 4 IO-Link ports	75x-657

The IO-Link master exchanges input and output data with the attached IO-Link devices. In addition, acyclic parameter settings can be done and status information can be accessed.
The following table lists the number of bytes reserved for the individual module in the respective process image (PI).

Table 146: IO-Link master – Number of bytes

I/O Modules / PBDP module type	Proxy (PBDP module type)					
	Data length [Byte]		Configuration identifier		Data type	Inst.
	I	O	hex	dec		
IOL_SIO	2	2	0xB1	177	UINT8[2]	1
IOL_SIO_02D	4	4	0xB3	179	UINT8[2], UINT8[2]	1
IOL_SIO_04D	6	6	0xB5	181	UINT8[2], UINT8[4]	1
IOL_SIO_06D	8	8	0xB7	183	UINT8[2], UINT8[6]	1
IOL_SIO_08D	10	10	0xB9	185	UINT8[2], UINT8[8]	1
IOL_SIO_12D	14	14	0xBD	189	UINT8[2], UINT8[12]	1
IOL_SIO_16D	18	18	0xF8	248	UINT8[2], UINT8[16]	1
IOL_SIO_20D	22	22	0xFA	250	UINT8[2], UINT8[20]	1

By loading a slot with the IOL_xxD configuration modules, 2, 4, 6, 8, 10, 14, 18 or 22 bytes are set up in the input and output process image of the station proxy (fieldbus coupler) and assigned to the configured I/O module. The breakdown of the process image on the available ports is available in the parameterization and the manual of the IO-Link master. All configuration modules allow acyclic access to the data structures of the IO-Link master and IO-Link devices (I&M, IOL-SPDU).

The following table describes the process image information of the individual module types for the IO-Link master.

Table 147: IO-Link master – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
IOL_SIO	**I**	0	**PD**	**F**	**FP4**	**FP3**	**FP2**	**FP1**	**FP0**	**FI**
		1	**-**	**-**	**-**	**-**	**SI3**	**SI2**	**SI1**	**SI0**
IOL_SIO_02D		2	**Input data Byte 0**							
		3	**Input data Byte 1**							
IOL_SIO_04D		4	**Input data Byte 2**							
		5	**Input data Byte 3**							
IOL_SIO_06D		6	**Input data Byte 4**							
		7	**Input data Byte 5**							
IOL_SIO_08D		8	**Input data Byte 6**							
		9	**Input data Byte 7**							
IOL_SIO_12D		10	**Input data Byte 8**							
		…	**…**							
		13	**Input data Byte 11**							
IOL_SIO_16D		…	**…**							
		17	**Input data Byte 15**							
IOL_SIO_20D		…	**…**							
		21	**Input data Byte 19**							

Table 147: IO-Link master – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
IOL_SIO	**O**	0								
		1	**-**	**-**	**-**	**-**	**SO3**	**SO2**	**SO1**	**SO0**
IOL_SIO_02D		2	**Output data Byte 0**							
		3	**Output data Byte 1**							
IOL_SIO_04D		4	**Output data Byte 2**							
		5	**Output data Byte 3**							
IOL_SIO_06D		6	**Output data Byte 4**							
		7	**Output data Byte 5**							
IOL_SIO_08D		8	**Output data Byte 6**							
		9	**Output data Byte 7**							
IOL_SIO_12D		10	**Output data Byte 8**							
		…	**…**							
		13	**Output data Byte 11**							
IOL_SIO_16D		…	**…**							
		17	**Output data Byte 15**							
IOL_SIO_20D		…	**…**							
		21	**Output data Byte 19**							

13.2.21 PA Configurations of the Supply Module with Diagnostics

The PI configurations of the supply module with diagnostics is divided into two module types:

Table 148: Supply modules – Module types

PBDP module type	Description	Proxy I/O modules
2DIA	Supply Modules, diagnostics	750-606, 750-610, 750-611
2PI-DIA (*2PI-DIA)	Supply Modules, 2-bit diagnostics in the input process image	750-606, 750-610, 750-611

Supply modules with diagnostics pass available diagnostics information to the DP master.
The following table lists the number of bytes or bits reserved for the individual configuration module in the respective process image (PI).

Table 149: Supply modules – Number of bytes

I/O Modules / PBDP module type	PBDP module type						* PBDP module type			
	Data length [Byte]				Configuration identifier		Data length [Byte]		Configuration identifier	
	PI packed?									
	no		yes		hex	dec	I	O	hex	dec
	I	O	I	O						
2DIA	0	0	-	-	0x00	0	-	-	-	-
2PI-DIA (*2PI-DIA)	1	0	2/8	0	0x10	16	2/8	0	0x00	0

The following table describes the process image information of the module type for the supply modules.

Table 150: Supply modules – Process image information

PBDP module type	PI	Offset [Byte]	Bit/byte allocation							
			2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
2PI-DIA	**I**	0							**D1**	**D0**
***2PI-DIA**	**I**	0					**D1**	**D0**		
					D1	**D0**				
			D1	**D0**						

13.3 Parameter of the Fieldbus Coupler and the I/O modules

13.3.1 Parameter of the Fieldbus Coupler

13.3.1.1 Parameters of the Station Proxy

Table 151: Parameters of the fieldbus coupler as station proxy (FC_SSV)

FC_SSV (slot 0)		750-333	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
19	23		
Parameter	**Settings**	**Description**	**Scope**
Fail-safe		In the state Clear_DATA of the PROFIBUS DP master, the station receives	Station
	deactivated (not possible)	• zeroed output data in the configured length.	
	activated*)	• no output data.	
Startup if expected/actual config. differ		The station cannot / can accept the PROFIBUS DP data exchange with configured option modules	Station
	deactivated*)	• not possible.	
	activated	• possible.	
Restart on K-Bus failure		After a fault, for example a missing end module, a restart of the internal data bus will be initiated, if	Station
	POWER ON RESET*)	• an interruption of the fieldbus coupler supply.	
	AUTORESET	• immediately after disappearing of the internal bus fault.	
Device diagnosis		The diagnostic information of all I/O modules with a diagnostics capability, for which the diagnostics is released, are	Station
	enabled*)	• transmitted to the PROFIBUS DP master.	
	disabled	• not transmitted to the PROFIBUS DP master.	
Identifier related diagnosis		The identifier-related diagnostic object is	Station
	disabled	• not in the diagnostic telegram.	
	for max. possible no. of modules*)	• in the length for the maximum possible number of I/O modules in the diagnostic telegram.	
	for actual number of modules	• in the length for the currently configured number of I/O modules in the diagnostic telegram.	
Module status		The module status is	Station
	disabled*)	• not in the diagnostic telegram.	
	for max. possible no. of modules	• in the length for the maximum possible number of I/O modules in the diagnostic telegram.	
	for actual number of modules	• in the length for the currently configured number of I/O modules in the diagnostic telegram.	
Module extension		Use of the internal data bus extension is	Station
	EEPROM-Settings*)	• based on the settings made in the EEPROM that are made using the “WAGO Extension Settings” tool.	
	is not used	• excluded.	
	is used	• possible.	
Process data representation		Word or double-word-oriented process data are transmitted to the PROFIBUS DP master in	Station
	INTEL (LSB-MSB)	• “Little Endian” format.	
	MOTOROLA (MSB-LSB)*)	• “Big Endian” format.	

Table 151: Parameters of the fieldbus coupler as station proxy (FC_SSV)

FC_SSV (slot 0)		750-333	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
19	23		
Parameter	**Settings**	**Description**	**Scope**
Response to PROFIBUS DP failure		In the event of a malfunction of the PROFIBUS DP communication, the status of the available output periphery can be influenced in various ways	Station
	K-Bus transmission stops	• the process data exchange on the internal bus is stopped, all outputs are switched off after a module specific monitoring time of 100 ms.	
	Output image is cleared	• all outputs are immediately switched off.	
	Output image is stored	• all outputs maintain the last status before the malfunction.	
	Substitute values are switched*)	• all outputs take an individually parameterizable substitute value.	
Response to K-Bus failure		In the event of a malfunction in the internal communication between fieldbus coupler and I/O modules, such as, for example no end module	Station
	PROFIBUS communication stops*)	• the data exchange with the PROFIBUS DP master is stopped.	
	Input image is cleared	• all input information is set to zero.	
	Input image is stored	• the input information immediately before the fault is maintained.	
Startup via DPV1 channel		The cyclic data exchange occurs	Station
	disabled*)	• immediately after a successful parameterization and configuration.	
	enabled	• only after release of the data exchange on the acyclic C1 or C2 channel.	
Slot assignment		Assigning the slots for acyclic read and write is performed	Station
	DP/V1-compatible*)	• according to DP/V1.	
	S7-compatible	• according to S7.	
IOL diagnosis via		In the event that the diagnostics for the corresponding port have been released, the diagnostic results of all IO-Link masters and the connected IO-Link devices are reported as	Station
	Identifier related diagnosis*)	• channel-specific diagnostics.	
	IOL status message	• IO-Link status message.	

*) Default settings

13.3.1.2 Parameters of the Process Data Channel

Table 152: Parameters of the process data channel of the fieldbus coupler (FC_PZK)

FC_PZK (slot 1)		750-333	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
3	7		
Parameter	**Settings**	**Description**	**Scope**
---	---	---	---

13.3.2 Parameters of the I/O Modules

13.3.2.1 Parameters of the Digital Input Modules

The table shows the parameterization properties of the 1, 2, 4, 8 and 16-channel digital input modules without asynchronous diagnostic properties.

Table 153: Parameters of the 1, 2, 4, 8 and 16-channel digital input modules (DI)

1DI_1PI-DIA, 2DI, 4DI, 8DI, 16DI		**Representatives of the 1DI_1PI-DIA:** 75x-435, **Representatives of the 2DI**: 75x-400, 75x-401, 75x-405, 75x-406, 75x-410, 75x-411, 75x-412, 75x-413, 75x-416, ´75x-427, 75x-429, 75x-438, **Representatives of the 4DI**: 75x-402, 75x-403, 75x-408, 75x-409, 75x-414, 75x-415, 75x-422, 75x-423, 75x-424, 75x-428, 75x-432, 75x-433, 75x-440, 75x-1420, 75x-1421, 75x-1422, 75x-1423, **Representatives of the 8DI** 75x-430, 75x-431, 75x-434, 75x-436, 75x-437, 75x-1415, 75x-1416, 75x-1417, 75x-1418, **Representatives of the 16DI**: 750-1400, 750-1402, 75x-1405, 75x-1407	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
3	7		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physical		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) set to zero from by the fieldbus coupler.	
	plugged*)	• supplied by the I/O module.	

*) Default settings

The table shows the parameterization properties of the 2-channel digital input modules with asynchronous diagnostic properties.

Table 154: Parameters of the 2-channel digital input modules (DI_DIA)

2DI_2DIA, 2DI_2PI-DIA, 2DI_2DIA_2ACK, 2DI_2PI-DIA_2ACK		**Representatives of 2DI_2DIA respectively 2DI_2PI-DIA**: 75x-419, 75x-421, 75x-425, **Representatives of 2DI_2DIA_2ACK respectively 2DI_2PI-DIA_2ACK**: 75x-418	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
3	7		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physicaly		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) set to zero by the fieldbus coupler.	
	plugged*)	• supplied by the I/O module.	
Map diagnosis to input PI[1)]		The diagnostic information of the I/O module is	Module
	disabled*)	• not mapped into the input process image.	
	enabled	• mapped into the input process image.	
Diagnosis		The diagnostic information of the corresponding channel is	Channel
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	

*) Default settings

1) Only applies to “*”-modules, e.g. *75x-419

13.3.2.2 Parameters of the Digital Output Modules

The table shows the parameterization properties of the 2, 4, 8 and 16-channel digital output modules without asynchronous diagnostic properties.

Table 155: Parameters of the 2, 4, 8 and 16-channel digital output modules (DO)

2DO, 4DO, 8DO, 16DO		**Representatives of the 2DO:** 75x-501, 75x-502, 75x-509,´75x-512, 75x-513, 75x-514, 75x-517, 75x-535, **Representatives of the 4DO:** 75x-504, 75x-516, 75x-519, 75x-531, 75x-540, **Representatives of the 8DO:** 75x-530, 75x-534, 75x-536, 75x-1515, 75x-1516, **Representatives of the 16DO:** 750-1500, 75x-1501, 750-1504, 75x-1505	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
3 (4[1)])	7 (8[1)])		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) filtered by the fieldbus coupler.	
	plugged[*)]	• output to the periphery.	
Substitute value		If, in the event of a PROFIBUS DP fault, the switching of substitute values is enabled, within the fieldbus coupler parameterization, this value is transmitted to the periphery in the event of a fault.	Channel
	0[*)]		
	1		

[*)] Default settings
[1)] Applies to 16DO

The following table shows the parameterization properties of the 1, 2, 4 and 8-channel digital output modules with asynchronous diagnostic properties.

Table 156: Parameters of the 1, 2, 4 and 8-channel digital output modules (DO_DIA)

1DO_1DIA, 1DO_1PI-DIA, 2DO_2DIA, 2DO_2PI-DIA, 2DO_4DIA, 2DO_4PI-DIA, 4DO_4DIA, 4DO_4PI-DIA 8DO_8DIA, 8DO_8PI-DIA		**Representatives of the 1DO_1DIA or 1DO_1PI-DIA:** 75x-523, **Representatives of the 2DO_2DIA or 2DO_2PI-DIA:** 75x-507, 75x-508, 75x-522, **Representatives of the 2DO_4DIA or 2DO_4PI-DIA:** 75x-506, **Representatives of the 4DO_4DIA or 4DO_4PI-DIA:** 75x-532, **Representatives of the 8DO_8DIA or 8DO_8PI-DIA:** 75x-537	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
3 (4[1)])	7 (8[1)])		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) filtered by the fieldbus coupler or set to zero.	
	plugged[*)]	• output to the periphery.	
Map diagnosis to input PI[2)]		The diagnostic information of the I/O module is	Module
	disabled[*)]	• not mapped into the input process image.	
	Enabled	• mapped into the input process image.	
Diagnosis		The diagnostic information of the corresponding channel is	Channel
	disabled[*)]	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	

Table 156: Parameters of the 1, 2, 4 and 8-channel digital output modules (DO_DIA)

1DO_1DIA, 1DO_1PI-DIA, 2DO_2DIA, 2DO_2PI-DIA, 2DO_4DIA, 2DO_4PI-DIA, 4DO_4DIA, 4DO_4PI-DIA 8DO_8DIA, 8DO_8PI-DIA		**Representatives of the 1DO_1DIA or 1DO_1PI-DIA:** 75x-523, **Representatives of the 2DO_2DIA or 2DO_2PI-DIA:** 75x-507, 75x-508, 75x-522, **Representatives of the 2DO_4DIA or 2DO_4PI-DIA:** 75x-506, **Representatives of the 4DO_4DIA or 4DO_4PI-DIA:** 75x-532, **Representatives of the 8DO_8DIA or 8DO_8PI-DIA:** 75x-537	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
3 (4[1)])	7 (8[1)])		
Substitute value		If, in the event of a PROFIBUS DP fault, the switching of substitute values is enabled, within the fieldbus coupler parameterization, this value is transmitted to the periphery in the event of a fault.	Channel
	0[*)]		
	1		

[*)] Default settings
[1)] Applies to **8DO_8DIA** and **8DO_8PI-DIA**
[2)] Only applies to "*"-modules, e.g. *75x-501

13.3.2.3 Parameters of the Digital Input/Output Modules

The table shows the parameterization properties of the digital input/output modules.

Table 157: Parameters of the 8-channel digital input/output modules (DO_DI)

8DO_8DI		**Representatives of the 8DO_8DI:** 750-1502, 75x-1506	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
3	7		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) filtered by the fieldbus coupler or set to zero.	
	plugged[*)]	• output to the periphery.	
Substitute value		If, in the event of a PROFIBUS DP fault, the switching of substitute values is enabled, within the fieldbus coupler parameterization, this value is transmitted to the periphery in the event of a fault.	Channel
	0[*)]		
	1		

[*)] Default settings

13.3.2.4 Parameters of the Analog Input Modules

The table shows the parameterization properties of the 1, 2, 3 and 4-channel analog input modules with asynchronous diagnostic properties, but without individual parameters.

Table 158: Parameters of the 1, 2, 3 and 4-channel analog input modules (AI)

1AI, 2AI, 3AI, 4AI		**Representatives of the 1AI:** 75x-491 **Representatives of the 2AI:** 75x-452, 75x-454, 75x-456, 75x-461, 75x-462, 75x-465, 75x-466, 75x-467, 75x-469, 75x-470, 75x-472, 75x-473, 75x-474, 75x-475, 75x-476, 75x-477, 75x-478, 75x-479, 75x-480, 75x-481, 75x-483, 75x-485, 75x-487, 75x-492, **Representatives of the 3AI:** 75x-493, **Representatives of the 4AI:** 75x-453, 75x-455, 75x-457, 75x-459, 75x-460, 75x-463, 75x-464, 75x-468	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
4	8		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) set to zero or filtered by the fieldbus coupler.	
	plugged*)	• supplied by the I/O module.	
Diagnosis		The diagnostic information of the corresponding channel is	Channel
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	

*) Default settings

The table shows the parameterization properties of the 4 and 2-channel analog input modules with asynchronous diagnostic properties and individual parameters.

Table 159: Parameters of the 4(2)-channel analog input modules (AI_PAR)

4AI_PAR (2AI_PAR)		**Representatives of the 4AI_PAR:** 75x-463, 75x-464, 75x-464/020-000, **Representatives of the 2AI_PAR:** 75x-464	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
6	10		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) set to zero by the fieldbus coupler.	
	plugged*)	• supplied by the I/O module.	
Diagnosis		The diagnostic information of the corresponding channel is	Channel
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	
Sensor type2)		The sensor is of type	Channel
	Pt1000 (IEC 751)*)	• Thermoresistor Pt1000	
	Ni1000 (DIN 43760)	• Thermoresistor Ni1000	
	Ni1000 (TK 5000)	• Thermoresistor Ni1000	
	KTY 81 110	• Thermoresistor Si110	
	KTY 81 210	• Thermoresistor Si210	
Sensor type3)		The sensor is of type	Channel
	Pt100 (IEC 60751)*)	• Thermoresistor Pt100	
	Ni100 (DIN 43760)	• Thermoresistor Ni100	
	Pt1000 (IEC 60751)	• Thermoresistor Pt1000	
	Pt500 (IEC 60751)	• Thermoresistor Pt500	
	Pt200 (IEC 60751)	• Thermoresistor Pt200	
	Ni1000 (TK 6180, DIN 43760)	• Thermoresistor Ni1000	
	Ni120 (Minco)	• Thermoresistor Ni120	
	Ni1000 (TK 5000, DIN 43760)	• Thermoresistor Ni1000	
	Potentiometer1)	• Potentiometer	
	Resistor 10R-5k (linear)1)	• Resistor 10R-5k (linear)	
	Resistor 10R-1k2 (linear)1)	• Resistor 0R-1k2 (linear)	
Connection type		The sensor is connected by	Channel
	2-wire connection1)	• 2 conductors.	
	3-wire connection	• 3 conductors.	

*) Default settings
1) Only in operating mode 2AI
2) Applies to 75x-463
3) Applies to 75x-464

The table shows the parameterization properties of the 2-channel analog input modules HART with asynchronous diagnostic properties and individual parameters.

Table 160: Parameters of the 2-channel analog input modules HART (AI_HART)

2AI_HART		**Representatives of the 2AI_HART:** 75x-482, 75x-484	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
8[1] (10[2])	12[1] (14[2])		
Parameter	**Settings**	**Description**	**Scope**
Amount of preamble bytes		Die preamble has a length of	Module
	5*)	• 5 byte	
	6	• 6 byte	
	7	• 7 byte	
	…	…	
	20	20 byte	
HART transmission retries		In the event of a malfunction, the HART telegram is transmitted again	Module
	0	• no	
	1	• once	
	2	• twice	
	3*)	• three times	
	…	…	
	10	• ten times	
Diagnosis		The diagnostic information of the corresponding channel is	Channel
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	
Filter time [ms] [1]		The input filter time is	Channel
	10	• 10 ms	
	20*)	• 20 ms	
	40	• 40 ms	
	80	• 80 ms	
	160	• 160 ms	
	320	• 320 ms	
	640	• 640 ms	

*) Default settings

1) Applies to I/O module 75x-482

2) Applies to I/O module 75x-484

The table shows the parameterization properties of the 4 and 8-channel analog input modules with asynchronous diagnostic properties and individual parameters.

Table 161: Parameters of the 4 (8)-channel analog input modules (AI_PAR)

4AI_PAR (8AI_PAR)		**Representatives of the 4AI_PAR:** 75x-450 **Representatives of the 8AI_PAR:** 75x-451	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
12[1] (21[2])	16[1] (25[2])		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) set to zero by the fieldbus coupler.	
	plugged*)	• supplied by the I/O module.	
Number format		The format of the number representation	Module
	two complement*)	• 2nd complement.	
	value/sign	• Amount plus leading sign.	
Siemens S5 format		Raw value range and Resolution according	Module
	deactivated*)	• standard.	
	activated	• Siemens S5-FB250 format.	
Notch-Filter		The limiting frequency of the des Filters	Module
	deactivated	• 100 Hz	
	50 Hz*)	• 50 Hz	
	60 Hz	• 60 Hz	
	50/60 Hz	• 50 and 60 Hz	
Diagnosis		The diagnostic information of the corresponding channel is	Channel
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	
Sensor type		The sensor is of type	Channel
	Pt100 (EN 60751)*)	• Thermoresistor Pt100	
	Ni100 (DIN 43760)	• Thermoresistor Ni100	
	Pt1000 (EN 60751)	• Thermoresistor Pt1000	
	Pt500 (EN 60751)	• Thermoresistor Pt500	
	Pt200 (EN 60751)	• Thermoresistor Pt200	
	Ni1000 (TK 6180, DIN 43760)	• Thermoresistor Ni1000	
	Ni120 (Minco)	• Thermoresistor Ni120	
	Ni1000 (TK5000, DIN 43760)	• Thermoresistor Ni1000	
	Ni1000 [TK6180, DIN 43760) HR	• Thermoresistor Ni1000	
	Ni1000 (TK 5000, DIN 43760) HR	• Thermoresistor Ni1000	
	Pt1000 (EN 60751) HR	• Thermoresistor Pt1000	
	Potentiometer[3]	• Potentiometer	
	Resistor 0R … 5k (linear)	• Resistor 0 Ω … 5000 Ω (linear)	
	Resistor 0R … 1k2 (linear)	• Resistor 0 Ω … 1200 Ω (linear)	
Connection Type		The connection of the sensor	Channel
	deactivated	• not.	
	2-wire connection*)	• with 2 conductors.	
	3-wire connection [3]	• with 3 conductors.	
	4-wire connection [3]	• with 4 conductors.	

*) Default settings
[1] Applies to I/O module 75x-450
[2] Applies to I/O module 75x-451
[3] Only applies to 4AI (75x-450)

The table shows the parameterization properties of the 3-phase power measurement modules with asynchronous diagnostic properties and individual parameters.

Table 162: Parameter of the 3-phase power measurement modules (1AI_PAR)

1AI_PAR		**Representatives of the 1AI_PAR:** 75x-494, 75x-494/000-001, 75x-495, 75x-495/000-001, 75x-495/000-002	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
20[1] (22[2])	24[1] (26[2])		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) set to zero by the fieldbus coupler.	
	plugged[*]	• supplied by the I/O module.	
Diagnosis		The diagnostic information of the corresponding channel is	Channel
	disabled[*]	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	
K-Bus Monitoring		If no process data is received for 100 ms, the watchdog of the I/O module triggers	Module
	deactivated[*]	• not.	
	activated	• yes.	
DC Measurement		Measurement DC measured values	Module
	deactivated[*]	• not possible.	
	activated	• possible.	
Network frequency		The network frequency is	Module
	50 Hz[*]	• 50 Hz	
	60 Hz	• 60 Hz	
Phase for peak value		The phase for determining of the peak value is	Module
	L1[*]	• L1	
	L2	• L2	
	L3	• L3	
Scaling factor energy values		The scaling factor of the energy values is	Module
	1 mWh[3)*]	• 1 mWh	
	0,01 Wh[3)]	• 10 mWh	
	0,1 Wh[3)]	• 100 mWh	
	1 Wh[3)]	• 1 Wh	
	0,01 kWh[3)]	• 10 Wh	
	0,1 kWh[3)]	• 100 Wh	
	1 kWh[3)]	• 1 kWh	
	5 mWh[4)*]	• 5 mWh	
	0,05 Wh[4)]	• 50 mWh	
	0,5 Wh[4)]	• 500 mWh	
	5 Wh[4)]	• 5 Wh	
	0,05 kWh[4)]	• 50 Wh	
	0,5 kWh[4)]	• 500 Wh	
	5 kWh[4)]	• 5 kWh	
Storing interval energy consumption [s]		The sensor is connected with	Module
	60[1] … 255	• 60 s … 255 s	
Detection Rogowski coils[5)]		There are Rogowski coils used type	Module
	RT500[*]	• RT500	
	RT2000	• RT2000	
Auto Reset Min-/Max values		The minimum and maximum current, voltage, power and frequency values	Channel
	deactivated	• not automatically deleted.	
	activated	• automatically deleted.	
User-defined scaling		The User-defined scaling is	Channel
	deactivated	• inactive.	
	activated	• active.	

Table 162: Parameter of the 3-phase power measurement modules (1AI_PAR)

1AI_PAR		**Representatives of the 1AI_PAR:** 75x-494, 75x-494/000-001, 75x-495, 75x-495/000-001, 75x-495/000-002	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
20[1] (22[2])	24[1] (26[2])		
Current transformer ratio, LB		The current transformer ratio is	Channel
	0, 1[*] … 255	• 1 … 255	
Current transformer ratio, HB			
	0[*], 1 … 255		
Observation interval, peak value [HW]		Peak values are cyclically calculated in interval of	Channel
	10[*] … 254	• 10 half-waves … 254 half-waves.	
Reset interval [200 ms]		The interval for reset the minimum/maximum values is	Channel
	10[*] … 255	• 2 s … 51 s	

[*] Default settings
[1] Applies to I/O module 75x-494(/000-001)
[2] Applies to I/O module 75x-495(/000-00x)
[3] Applies to I/O module 75x-49x
[4] Applies to I/O module 75x-49x/000-001
[5] Applies to I/O module 75x-49x/000-002

13.3.2.5 Parameters of the Analog Output Modules

The following two tables show the parameterization properties of the 2 and 4-channel analog out modules with asynchronous diagnostic properties, but without individual parameters.

Table 163: Parameters of the 2 and 4-channel analog output modules (AO)

2AO, 4AO		**Representatives of the 2AO:** 75x-550, 75x-552, 75x-554, 75x-556, 75x-560, 75x-585, **Representatives of the 4AO:** 75x-551, 75x-553, 75x-555, 75x-557, 75x-559	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
6 (10[1)])	10 (14[1)])		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) filtered by the fieldbus coupler or set to zero.	
	plugged[*)]	• output to the periphery.	
Diagnosis[2)]		The diagnostic information of the corresponding channel is	Channel
	disabled[*)]	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	
Substitute value	-32767 … 0[*)] … 32767 or 0[*)] … 32767	If, in the event of a PROFIBUS DP fault, the switching of substitute values is enabled, within the fieldbus coupler parameterization, this value is transmitted to the periphery in the event of a fault.	Channel

[*)] Default settings
[1)] Applies to 4AO
[2)] Applies to I/O module 75x-560

The table shows the parameterization properties of the 2-channel analog output modules with asynchronous diagnostic properties and individual parameters.

Table 164: Parameters of the 2-channel analog output modules (AO_PAR)

2AO_PAR		**Representatives of the 2AO_PAR:** 75x-562, 75x-563	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
10	14		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) filtered by the fieldbus coupler.	
	plugged[*)]	• output to the periphery.	
Diagnosis		The diagnostic information of the corresponding channel is	Channel
	disabled[*)]	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	
User scale		The user scaling is	Channel
	disabled[*)]	• disabled	
	enabled	• enabled.	
Calibration		The calibration occurs by	Channel
	user	• the user.	
	factory[*)]	• the manufacturer.	
Number representation		The process data follows the representation	Channel
	Twos complement[*)]	• 2nd complement.	
	Value plus sign	• Amount plus leading sign.	

Table 164: Parameters of the 2-channel analog output modules (AO_PAR)

2AO_PAR		**Representatives of the 2AO_PAR:** 75x-562, 75x-563	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
10	14		
Parameter	**Settings**	**Description**	**Scope**
Operating mode[1)]		The corresponding output channel works in the range	Channel
	0-10 V[*)]	• 0 … 10 V	
	+/-10 V	• +/-10 V	
Operating mode[2)]		The corresponding output channel works in the range	Channel
	0-20 mA	• 0 … 20 mA	
	4-20 mA[*)]	• 4 … 20 mA	
	6-18 V	• 6 … 18 V	
On exceeding user limits		If the limit value in regard to the output data is exceeded, the output value is	Channel
	No limitation of output value	• not limited.	
	Limitation of output value	• limited.	
Output		The corresponding output is	Channel
	in parameterized operating mode[*)]	• working in the configured operating mode.	
	high-impedance	• high-resistance disabled.	
Behavior on K-Bus timeout		With I/O module response monitoring of 100 ms	Channel
	0 V output[*)1)]	• outputs the corresponding output 0 V.	
	output 0 mA respective 6 V[*)2)]	• the corresponding output is set to 0 mA or 6 V depending on the operating mode.	
	hold last output value	• the last output value is output.	
	output manufacturer substitute value	• the manufacturer substitute value is output.	
	set output to high-impedance	• the corresponding output is switched to high-impedance.	
Switch-on delay [s]		After switching off the corresponding output by exceeding the maximum operating temperature, restart occurs after	Channel
	0.10	• 0.1 s	
	0.20	• 0.2 s	
	0.30	• 0.3 s	
	0.50[*)]	• 0.5 s	
	0.75	• 0.75 s	
	1.00	• 1 s	
	2.00	• 2 s	
Substitute value	0[*)] … 65535	If, in the event of a PROFIBUS DP fault, the switching of substitute values is enabled by the fieldbus coupler parameterization, this value is transmitted to the periphery in the event of a fault.	Channel

[*)] Default settings
[1)] Applies to 75x-562
[2)] Applies to 75x-563

13.3.2.6 Parameters of the Up/Down Counters

The table shows the parameterization properties of the up/down counters.

Table 165: Parameter of the up/down counters (CNT)

CNT		**Representatives of the CNT:** 75x-404, 75x-633, 75x-638	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
4	8		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) set to zero or filtered by the fieldbus coupler.	
	plugged*)	• processed by the I/O module.	
Diagnosis1)		The diagnostic information of the corresponding channel is	Channel
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	

*) Default settings
1) Only applies to 75x-633

13.3.2.7 Parameters of the 2-Channel Pulse Width Output Module

The table shows the parameterization properties of the 2-channel pulse width output module.

Table 166: Parameters of the 2-channel pulse width output module (PWM)

PWM		**Representatives of the PWM:** 75x-511	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
8	12		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) set to zero or filtered by the fieldbus coupler.	
	plugged*)	• supplied by the I/O module or output to the periphery.	
Substitute value	-32767 … 0*) … 32767 or 0*) … 32767	If, in the event of a PROFIBUS DP fault, the switching of substitute values is enabled, within the fieldbus coupler parameterization, this value is transmitted to the periphery in the event of a fault.	Channel

*) Default settings

13.3.2.8 Parameters of the Modules for the Distance and Angle Measurement

The table shows the parameterization properties of the SSI encoder interface, incremental encoder interface and the digital pulse interface.

Table 167: Parameters of the modules for the distance and angle measurement (SSI, ENC, DII)

SSI, ENC, DII		**Representatives of SSI:** 75x-630, **Representatives of ENC:** 75x-631, 75x-634, 75x-637, **Representatives of DII:** 75x-635	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
4	8		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) set to zero or filtered by the fieldbus coupler.	
	plugged*)	• processed by the I/O module.	
Diagnosis1)		The diagnostic information of the corresponding channel is	Channel
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	

*) Default settings

1) Does not apply to 75x-631 and 75x-634

13.3.2.9 Parameters of the Serial Interface

The table shows the parameterization properties of the serial interface with partial asynchronous diagnostic properties, but without individual parameters.

Table 168: Parameters of the serial interface (SER)

SER		**Representatives of SER:** 75x-650, 75x-651, 75x-653, 75x-654	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
4	8		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) set to zero or filtered by the fieldbus coupler.	
	Plugged*)	• processed by the I/O module.	
Diagnosis1)		The diagnostic information of the corresponding channel is	Channel
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	

*) Default settings

1) Does not apply to 75x-654

The table shows the parameterization properties of the serial interfaces with asynchronous diagnostic properties and individual parameters.

Table 169: Parameters of the serial interface (SER_PAR)

SER_PAR		**Representatives of SER_PAR:** 75x-652	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
8	12		
Parameter	**Settings**	**Description**	**Scope**
Diagnosis		The diagnostic information of the corresponding channel is	Module
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	
Operating mode		The physical interface works in the operating mode	Module
	RS-232	• RS-232C	
	RS-485 half-duplex*)	• RS-485 half-duplex	
	RS-485 full-duplex	• RS-485 full-duplex	
Transmission rate [bit/s]		The characters in the process image are sent or received serially with a transmission rate of	Module
	300	• 300 bit/s	
	1200	• 1200 bit/s	
	2400	• 2400 bit/s	
	4800	• 4800 bit/s	
	9600*)	• 9600 bit/s	
	19200	• 19200 bit/s	
	38400	• 38400 bit/s	
	57600	• 57600 bit/s	
	115200	• 115200 bit/s	
Data bits		A character includes	Module
	8*)	• 8 Bit	
	7	• 7 Bit	
Parity		The parity bit forms the quality rating	Module
	none*)	• not	
	odd	• odd	
	even	• even	
Stop bits		The number of stop bits is	Module
	1*)	• 1 Bit	
	2	• 2 Bit	
Flow control		The flow control of the serial data occurs	Module
	none*)	• not.	
	Xon/Xoff	• per Xon/Xoff protocol.	
	Hardware	• per RTS and CTS signals.	
Continuous send mode		Continuous transmitting is	Module
	disabled*)	• switched off.	
	enabled	• switched on.	
Continuous receive mode		Continuous receiving is	Module
	disabled*)	• switched off.	
	enabled	• switched on.	
Slew rate RS-485		The switchover time in RS-485 mode is	Module
	100 µs*)	• 100 µs	
	2 symbols	• 2 symbol lengths	
	4 symbols	• 4 symbol lengths	
Timeout continuous receive mode		The monitoring time for continuous receiving is	Module
	2 symbols*)	• 2 symbol lengths.	
	4 symbols	• 4 symbol lengths.	
Switching time RS-485		The switchover time in RS-485 mode is	Module
	low*)	• low.	

*) Default settings

13.3.2.10 Parameters of the DALI/DSI Master Modules

The table shows the parameterization properties of the DALI/DSI master modules with asynchronous diagnostic properties.

Table 170: Parameters of the DALI/DSI master modules (DALI)

DALI		**Representatives of DALI:** 75x-641	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
4	8		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) set to zero or filtered by the fieldbus coupler.	
	plugged*)	• processed by the I/O module.	
Diagnosis		The diagnostic information of the corresponding channel is	Module
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	

*) Default settings

13.3.2.11 Parameters of the AS Interface Master

The table shows the parameterization properties of the AS interface master with asynchronous diagnostic properties and individual parameters.

Table 171: Parameters of the AS interface master (ASI)

ASI		**Representatives of ASI:** 75x-655	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
6	10		
Parameter	**Settings**	**Description**	**Scope**
Diagnosis		The diagnostic information of the corresponding channel is	Module
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	
Mailbox length		The length of the acyclic channel (Mailbox) is	Module
	no mailbox	• 0 byte	
	6 byte*)	• 6 byte	
	10 bytes	• 10 bytes	
	12 bytes1)	• 12 bytes	
	18 bytes 1)	• 18 bytes	
Cross fading of mailbox		The acyclic channel (Mailbox) can	Module
	disabled*)	• not override the process data.	
	enabled	• override the process data.	
Use of free PI areas2)		The unused data storage areas for module types ASI_38D and ASI_46D are	Module
	none (with ASi V2.1)	• unused.	
	Analog values (starting ASi 3.0)	• populated with analog values.	

*) Default settings

1) Only for process images larger than 12 bytes

2) Setting for AS-i 3.0 version or higher

13.3.2.12 Parameters of the EnOcean Radio Receiver

The table shows the parameterization properties of the EnOcean radio receiver with asynchronous diagnostic properties.

Table 172: Parameters of the EnOcean radio receiver (ENOC)

ENOC		**Representatives of ENOC:** 75x-642	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
4	8		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) set to zero or filtered by the fieldbus coupler.	
	plugged*)	• processed by the I/O module.	
Diagnosis		The diagnostic information of the corresponding channel is	Module
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	

*) Default settings

13.3.2.13 Parameters of the Bluetooth® RF Transceiver

The table shows the parameterization properties of the Bluetooth® RF transceiver with asynchronous diagnostic properties and individual parameters.

Table 173: Parameters of the Bluetooth® RF transceiver (BT)

BT		**Representatives of BT:** 75x-644	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
6	10		
Parameter	**Settings**	**Description**	**Scope**
Diagnosis		The diagnostic information of the corresponding channel is	Module
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	
Mailbox length		The length of the acyclic channel (Mailbox) is	Module
	6 Byte*)	• 6 byte	
	12 Byte1)	• 12 byte	
	18 Byte1)	• 18 byte	

*) Default settings

1) Only for process images larger than 12 bytes

13.3.2.14 Parameters of the MP-Bus Master Module

The table shows the parameterization properties of the MP-Bus master module with asynchronous diagnostic properties.

Table 174: Parameters of the MP-Bus master module (MP_BUS)

MP_BUS		**Representative of the MP_BUS:** 75x-643	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
4	8		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) set to zero or filtered by the fieldbus coupler.	
	plugged*)	• processed by the I/O module.	
Diagnosis		The diagnostic information of the corresponding channel is	Module
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS P master.	

*) Default settings

13.3.2.15 Parameters of the 2-channel Vibration Velocity / Roller Bearing Condition Monitoring VIB I/O

The table shows the parameterization properties of the VIB I/O 2-channel vibration velocity/bearing condition monitoring.

Table 175: Parameters of the VIB I/O 2-channel vibration velocity/bearing condition monitoring (VIB_IO)

VIB_IO		**Representative of the VIB_IO:** 75x-645	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
4	8		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) set to zero by the fieldbus coupler.	
	plugged*)	• supplied by the I/O module.	

*) Default settings

13.3.2.16 Parameters of the PROFIsafe I/O Modules

The following three tables show the parameterization properties of the PROFIsafe I/O modules with asynchronous diagnostic properties and individual parameters.

Table 176: Parameters of the PROFIsafe V1 I/O modules (PSAFE_V1)

PSAFE_V1		**Representative of the PSAFE_V1:** 750-660/000-001, 750-665/000-001	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
17	21		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) set to zero or filtered by the fieldbus coupler.	
	plugged*)	• supplied by the I/O module or output to the periphery.	
Diagnosis		The diagnostic information of the corresponding channel is	Module
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	
F_Check_SeqNr		In the F_CRC calculation, the sequence number is	Module
	Check	• included.	
	NoCheck*)	• not included.	
F_Check_iPar		iParameters in the F parameter field	Module
	NoCheck*)	• are not checked.	
F_SIL		The safety requirement level is	Module
	SIL3*)	• SIL3	
F_CRC_Length		The F_CRC has a length of	Module
	2-Byte-CRC*)	• 2 bytes	
F_Block_ID		The ID of the F parameter field is	Module
	0*)	• 0	
F_Par_Version		The PROFIsafe layer is operated in	Module
	V1-mode*)	• PROFIsafe V1 mode.	
F_Source_Add		The F source address can accept the following values:	Module
	1 … 65534	• 1 … 65534	
F_Dest_Add		The F destination address can accept the following values:	Module
	1 … 65534	• 1 … 65534	
F_WD_Time		The F monitoring time can accept the following values:	Module
	50 … 150*) … 10000	• 50 … 10000 ms	

*) Default settings

Table 177: Parameters of the PROFIsafe V2 I/O modules (PSAFE_V2)

PSAFE_V2		**Representative of the PSAFE_V2:** 753-662/000-002, 753-667/000-002, 75x-661/000-003, 75x-662/000-003, 75x-666/000-003, 75x-667/000-003	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
17	21		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) set to zero or filtered by the fieldbus coupler.	
	plugged *)	• supplied by the I/O module or output to the periphery.	
Diagnosis		The diagnostic information of the corresponding channel is	Channel
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	
F_Check_SeqNr		In the CRC calculation, the sequence number is	Module
	Check	• included.	
	NoCheck*)	• not included.	
F_Check_iPar		iParameters in the F parameter field	Module
	NoCheck*)	• are not checked.	
F_SIL		The safety requirement level is	Module
	SIL3*)	• SIL3.	
F_CRC_Length		The F_CRC has a length of	Module
	2-Byte-CRC	• 2 byte.	
	3-Byte-CRC*)	• 3 byte.	
F_Block_ID		The ID of the F parameter field is	Module
	0*)	• 0	
F_Par_Version		The PROFIsafe layer is operated in	Module
	V1-mode	• PROFIsafe V1 mode.	
	V2-mode*)	• PROFIsafe V2 mode.	
F_Source_Add		The F source address can accept the following values:	Module
	1 ... 65534	• 1 … 65534	
F_Dest_Add		The F destination address can accept the following values:	Module
	1 … 65534	• 1 … 65534	
F_WD_Time		The F monitoring time can accept the following values:	Module
	50 … 150*) … 10000	• 50 … 10000 ms	

*) Default settings

Table 178: Parameters of the PROFIsafe V2 I/O modules with iPar Server functionality (PSAFE_V2_iPar)

PSAFE_V2_iPar		**Representative of the PSAFE_V2_iPar:** 750-661/000-003, 75x-662/000-003, 75x-666/000-003, 75x-667/000-003	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
21	25		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) set to zero or filtered by the fieldbus coupler	
	plugged*)	• supplied by the I/O module or output to the periphery.	
Diagnosis		The diagnostic information of the corresponding channel is	Channel
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master	
F_Check_SeqNr		In the CRC calculation, the sequence number is	Module
	Check	• included.	
	NoCheck*)	• not included.	
F_Check_iPar		iParameters in the F parameter field	Module
	NoCheck*)	• are not checked.	
F_SIL		The safety requirement level is	Module
	SIL3*)	• SIL3.	
F_CRC_Length		Die F_CRC has a length of	Module
	3-Byte-CRC*)	• 3 bytes.	
F_Block_ID		The ID of the F parameter field is	Module
	1*)	• 1.	
F_Par_Version		The PROFIsafe layer is operated in	Module
	V2-mode*)	• PROFIsafe V2 mode.	
F_Source_Add		The F source address can accept the following values:	Module
	1 … 65534	1 … 65534	
F_Dest_Add		The F destination address can accept the following values:	Module
	1 … 65534	• 1 … 65534	
F_WD_Time		The F monitoring time can accept the following values:	Module
	50 … 150*) … 10000	• 50 … 10000 ms	
F_iPar_CRC		The CRC of the iParameter set can accept the following values:	Module
	0*) … 65535	• 0 … 65535	

*) Default settings

13.3.2.17 Parameters of the RTC Module

The table shows the parameterization properties of the RTC module.

Table 179: Parameters of the RTC module (RTC)

RTC		**Representative of the RTC:** 75x-640	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
4	8		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) set to zero or filtered by the fieldbus coupler.	
	plugged*)	• processed by the I/O module.	

*) Default settings

13.3.2.18 Parameters of the Stepper Modules

The table shows the parameterization properties of the stepper modules with asynchronous diagnostic properties and individual parameters.

Table 180: Parameter of the stepper modules (STEPPER)

STEPPER		**Representative of the STEPPER:** 75x-670, 75x-671, 750-672, 750-673	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
4	8		
Parameter	**Settings**	**Description**	**Scope**
Diagnosis		The diagnostic information of the corresponding channel is	Module
	disabled*)	• not transmitted to the PROFIBUS P master.	
	enabled	• transmitted to the PROFIBUS DP master.	

*) Default settings

13.3.2.19 Parameters of the DC Drive Controller

The table shows the parameterization properties of the DC drive controller with asynchronous diagnostic properties.

Table 181: Parameters of the DC drive controller (DC_DRIVE).

DC_DRIVE		**Representative of the DC_DRIVE:** 75x-636	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
2	6		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) set to zero or filtered by the fieldbus coupler.	
	plugged*)	• supplied by the I/O module or output to the periphery.	
Diagnosis		The diagnostic information of the corresponding channel is	Module
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	

*) Default settings

13.3.2.20 Parameters of the IO-Link Master

The table shows the parameterization properties of the IO-Link master with asynchronous diagnostic properties. There are two parameter sets of different lengths.

13.3.2.21 Parameter set 0

Table 182: Parameter set 0 of the IO-Link master (IOL_M)

IOL_M		**Representative of the IOL_M:** 75x-657	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
8	12		
Parameter	**Settings**	**Description**	**Scope**
Diagnosis		The diagnostic information of the corresponding channel is	Module
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	
Diagnosis		The diagnostic information of the corresponding port is	Port
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	
Fragmentation		Fragmentation of the process data of the corresponding port is	Port
	disabled*)	• not possible.	
	enabled	• possible.	

*) Default settings

13.3.2.21.1 Parameter set 2

Table 183: Parameter set 2 of the IO-Link-Masters (IOL_M)

IOL_M		**Representative of the IOL_M:** 75x-657	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
18	22		
Parameter	**Settings**	**Description**	**Scope**
Diagnosis		The diagnostic information of the corresponding channel is	Module
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	
Diagnosis		The diagnostic information of the corresponding port is	Port
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	
Multiplier cycle time		The multiplier to get the master cycle time is	Port
	0*) … 63	• 0 … 63	
Master cycle time [ms]		The cycle time in ms results from multiplying the multiplier parameter and	Port
	Multiplier * 0.1*)	• 0.1	
	6.4 + Multiplier * 0.4	• 0.4 plus 6.4	
	32.0 + Multiplier * 1.6	• 1.6 plus 32.0	
Operating mode		The operating mode of the corresponding port is	Port
	disabled	• Port disabled.	
	DI*)	• Digital input.	
	DO	• Digital output.	
	IO-Link	• IO-Link device.	
Fragmentation		Fragmentation of the process data of the corresponding port is	Port
	disabled*)	• not possible.	
	enabled	• possible.	
Length input-PI [byte]		Information about the corresponding port	Port
	0*)	• are not present in the input process image.	
	1	• occupy 1 byte in the input process image.	
	…	...	
	15	• occupy 15 bytes in the input process image.	Port
Length output-PI [byte]		Information about the corresponding port	
	0*)	• are not present in the output process image.	
	1	• occupy 1 byte in the input process image.	
	…	...	
	15	• occupy 15 bytes in the input process image.	

*) Default settings

13.3.2.21.2 Parameters of the Power Supply Modules

The table shows the parameterization properties of the power supply modules with asynchronous diagnostic properties.

Table 184: Parameters of the power supply modules with diagnostics (DIA)

2DIA, 2PI-DIA		**Representative of the 2DIA or 2PI-DIA :** 750-606, 750-610, 750-611	
Parameterization data length in bytes			
Standard parameterization	Structured parameterization		
3	7		
Parameter	**Settings**	**Description**	**Scope**
Terminal is physically		The I/O module process data is	Module
	(optionally) not plugged	• (optionally) set to zero by the fieldbus coupler.	
	plugged*)	• supplied by the I/O module.	
Diagnosis1)		The diagnostic information of the corresponding channel is	Module
	disabled*)	• not transmitted to the PROFIBUS DP master.	
	enabled	• transmitted to the PROFIBUS DP master.	

*) Default settings
1) Only applies to 2DIA

13.4 Acyclic Communication According to DP/V1

13.4.1 Possible Data Blocks for Digital Input/Output Modules

Table 185: Possible data blocks for digital input/output modules

Index	Data object (s)	Service primitives / Data length
0x00 / 0	Diagnostic data channel 0	MSAC1/2_Read / 2 Byte
0x01 / 1	Diagnostic data channel 1	MSAC1/2_Read / 2 Byte
0x02 / 2	Diagnostic data channel 2	MSAC1/2_Read / 2 Byte
0x03 / 3	Diagnostic data channel 3	MSAC1/2_Read / 2 Byte
0x04 / 4	Diagnostic data channel 4	MSAC1/2_Read / 2 Byte
0x05 / 5	Diagnostic data channel 5	MSAC1/2_Read / 2 Byte
0x06 / 6	Diagnostic data channel 6	MSAC1/2_Read / 2 Byte
0x07 / 7	Diagnostic data channel 7	MSAC1/2_Read / 2 Byte
0x20 / 32	Process input status channel 0	MSAC1/2_Read / 1 Bit (Byte)
0x21 / 33	Process input status channel 1	MSAC1/2_Read / 1 Bit (Byte)
0x22 / 34	Process input status channel 2	MSAC1/2_Read / 1 Bit (Byte)
0x23 / 35	Process input status channel 3	MSAC1/2_Read / 1 Bit (Byte)
0x24 / 36	Process input status channel 4	MSAC1/2_Read / 1 Bit (Byte)
0x25 / 37	Process input status channel 5	MSAC1/2_Read / 1 Bit (Byte)
0x26 / 38	Process input status channel 6	MSAC1/2_Read / 1 Bit (Byte)
0x27 / 39	Process input status channel 7	MSAC1/2_Read / 1 Bit (Byte)
0x20 / 32	Process input status channel 0	MSAC1/2_Read / 1 Bit (Byte)
0x21 / 33	Process input status channel 1	MSAC1/2_Read / 1 Bit (Byte)
0x22 / 34	Process input status channel 2	MSAC1/2_Read / 1 Bit (Byte)
0x23 / 35	Process input status channel 3	MSAC1/2_Read / 1 Bit (Byte)
0x24 / 36	Process input status channel 4	MSAC1/2_Read / 1 Bit (Byte)
0x25 / 37	Process input status channel 5	MSAC1/2_Read / 1 Bit (Byte)
0x26 / 38	Process input status channel 6	MSAC1/2_Read / 1 Bit (Byte)
0x27 / 39	Process input status channel 7	MSAC1/2_Read / 1 Bit (Byte)
0x28 / 40	Process input status channel 8	MSAC1/2_Read / 1 Bit (Byte)
0x29 / 41	Process input status channel 9	MSAC1/2_Read / 1 Bit (Byte)
0x2A / 42	Process input status channel 10	MSAC1/2_Read / 1 Bit (Byte)
0x2B / 43	Process input status channel 11	MSAC1/2_Read / 1 Bit (Byte)
0x2C / 44	Process input status channel 12	MSAC1/2_Read / 1 Bit (Byte)
0x2D / 45	Process input status channel 13	MSAC1/2_Read / 1 Bit (Byte)
0x2E / 46	Process input status channel 14	MSAC1/2_Read / 1 Bit (Byte)
0x2F / 47	Process input status channel 15	MSAC1/2_Read / 1 Bit (Byte)
0x40 / 64	Process output status channel 0	MSAC1/2_Read, MSAC2_Write / 1 Bit (Byte)
0x41 / 65	Process output status channel 1	MSAC1/2_Read, MSAC2_Write / 1 Bit (Byte)
0x42 / 66	Process output status channel 2	MSAC1/2_Read, MSAC2_Write / 1 Bit (Byte)
0x43 / 67	Process output status channel 3	MSAC1/2_Read, MSAC2_Write / 1 Bit (Byte)
0x44 / 68	Process output status channel 4	MSAC1/2_Read, MSAC2_Write / 1 Bit (Byte)

Table 185: Possible data blocks for digital input/output modules

Index	Data object (s)	Service primitives / Data length
0x45 / 69	Process output status channel 5	MSAC1/2_Read, MSAC2_Write / 1 Bit (Byte)
0x46 / 70	Process output status channel 6	MSAC1/2_Read, MSAC2_Write / 1 Bit (Byte)
0x47 / 71	Process output status channel 7	MSAC1/2_Read, MSAC2_Write / 1 Bit (Byte)
0x48 / 72	Process output status channel 8	MSAC1/2_Read, MSAC2_Write / 1 Bit (Byte)
0x49 / 73	Process output status channel 9	MSAC1/2_Read, MSAC2_Write / 1 Bit (Byte)
0x4A / 74	Process output status channel 10	MSAC1/2_Read, MSAC2_Write / 1 Bit (Byte)
0x4B / 75	Process output status channel 11	MSAC1/2_Read, MSAC2_Write / 1 Bit (Byte)
0x4C / 76	Process output status channel 12	MSAC1/2_Read, MSAC2_Write / 1 Bit (Byte)
0x4D / 77	Process output status channel 13	MSAC1/2_Read, MSAC2_Write / 1 Bit (Byte)
0x4E / 78	Process output status channel 14	MSAC1/2_Read, MSAC2_Write / 1 Bit (Byte)
0x4F / 79	Process output status channel 15	MSAC1/2_Read, MSAC2_Write / 1 Bit (Byte)
0xA0 / 160	Process input data module	MSAC1/2_Read / 1 (2) Byte [1)]
0xC0 / 192	Process output data module	MSAC1/2_Read, MSAC2_Write / 1 (2) Byte [1)]

[1)] The data length depends on the number of available input or output channels.

13.4.2 Data Blocks of the Module Types for Digital Input Modules and Supply Modules

Table 186: Data blocks of the module types for digital input modules and supply modules

Index	2DI	2DI_2DIA	2DI_2PI-DIA	2DI_2DIA_2ACK	2DI_2PI-DIA_2ACK	4DI	8DI	16DI	2DIA	2PI-DIA
0x00 / 0	✘	✓	✓	✓	✓	✘	✘	✘	✓	✘
0x01 / 1	✘	✓	✓	✓	✓	✘	✘	✘	✓	✘
0x02 / 2	✘	✘	✘	✘	✘	✘	✘	✘	✘	✘
0x03 / 3	✘	✘	✘	✘	✘	✘	✘	✘	✘	✘
0x04 / 4	✘	✘	✘	✘	✘	✘	✘	✘	✘	✘
0x05 / 5	✘	✘	✘	✘	✘	✘	✘	✘	✘	✘
0x06 / 6	✘	✘	✘	✘	✘	✘	✘	✘	✘	✘
0x07 / 7	✘	✘	✘	✘	✘	✘	✘	✘	✘	✘
0x20 / 32	✓	✓	✓	✓	✓	✓	✓	✓	✘	✓
0x21 / 33	✓	✓	✓	✓	✓	✓	✓	✓	✘	✓
0x22 / 34	✘	✘	✓	✘	✓	✓	✓	✓	✘	✘
0x23 / 35	✘	✘	✓	✘	✓	✓	✓	✓	✘	✘
0x24 / 36	✘	✘	✘	✘	✘	✘	✓	✓	✘	✘
0x25 / 37	✘	✘	✘	✘	✘	✘	✓	✓	✘	✘
0x26 / 38	✘	✘	✘	✘	✘	✘	✓	✓	✘	✘
0x27 / 39	✘	✘	✘	✘	✘	✘	✓	✓	✘	✘
0x28 / 40	✘	✘	✘	✘	✘	✘	✘	✓	✘	✘
0x29 / 41	✘	✘	✘	✘	✘	✘	✘	✓	✘	✘
0x2A / 42	✘	✘	✘	✘	✘	✘	✘	✓	✘	✘
0x2B / 43	✘	✘	✘	✘	✘	✘	✘	✓	✘	✘
0x2C / 44	✘	✘	✘	✘	✘	✘	✘	✓	✘	✘
0x2D / 45	✘	✘	✘	✘	✘	✘	✘	✓	✘	✘
0x2E / 46	✘	✘	✘	✘	✘	✘	✘	✓	✘	✘
0x2F / 47	✘	✘	✘	✘	✘	✘	✘	✓	✘	✘
0x40 / 64	✘	✘	✘	✓	✓	✘	✘	✘	✘	✘
0x41 / 65	✘	✘	✘	✓	✓	✘	✘	✘	✘	✘
0x42 / 66	✘	✘	✘	✘	✘	✘	✘	✘	✘	✘
0x43 / 67	✘	✘	✘	✘	✘	✘	✘	✘	✘	✘
0x44 / 68	✘	✘	✘	✘	✘	✘	✘	✘	✘	✘
0x45 / 69	✘	✘	✘	✘	✘	✘	✘	✘	✘	✘
0x46 / 70	✘	✘	✘	✘	✘	✘	✘	✘	✘	✘
0x47 / 71	✘	✘	✘	✘	✘	✘	✘	✘	✘	✘
0x48 / 72	✘	✘	✘	✘	✘	✘	✘	✘	✘	✘
0x49 / 73	✘	✘	✘	✘	✘	✘	✘	✘	✘	✘
0x4A / 74	✘	✘	✘	✘	✘	✘	✘	✘	✘	✘
0x4B / 75	✘	✘	✘	✘	✘	✘	✘	✘	✘	✘
0x4C / 76	✘	✘	✘	✘	✘	✘	✘	✘	✘	✘
0x4D / 77	✘	✘	✘	✘	✘	✘	✘	✘	✘	✘

Table 186: Data blocks of the module types for digital input modules and supply modules

Index	2DI	2DI_2DIA	2DI_2PI-DIA	2DI_2DIA_2ACK	2DI_2PI-DIA_2ACK	4DI	8DI	16DI	2DIA	2PI-DIA
0x4E / 78	✘	✘	✘	✘	✘	✘	✘	✘	✘	✘
0x4F / 79	✘	✘	✘	✘	✘	✘	✘	✘	✘	✘
0xA0 / 160	✓	✓	✓	✓	✓	✓	✓	✓	✘	✓
0xC0 / 192	✘	✘	✘	✓	✓	✘	✘	✘	✘	✘

13.4.3 Data Blocks of the Module Types for Digital Output and Digital Input/Output Modules

Table 187: Data blocks of the module types for digital output and digital input/output modules

Index	2DO	2DO_2DIA	2DO_2PI-DIA	2DO_4DIA	2DO_4PI-DIA	4DO	4DO_4DIA	4DO_4PI-DIA	8DO	8DO_8DIA	8DO_8PI-DIA	16DO	8DI_8DO
0x00 / 0	✖	✓	✓	✓	✓	✖	✓	✓	✖	✓	✓	✖	✖
0x01 / 1	✖	✓	✓	✓	✓	✖	✓	✓	✖	✓	✓	✖	✖
0x02 / 2	✖	✖	✖	✖	✖	✖	✓	✓	✖	✓	✓	✖	✖
0x03 / 3	✖	✖	✖	✖	✖	✖	✓	✓	✖	✓	✓	✖	✖
0x04 / 4	✖	✖	✖	✖	✖	✖	✖	✖	✖	✓	✓	✖	✖
0x05 / 5	✖	✖	✖	✖	✖	✖	✖	✖	✖	✓	✓	✖	✖
0x06 / 6	✖	✖	✖	✖	✖	✖	✖	✖	✖	✓	✓	✖	✖
0x07 / 7	✖	✖	✖	✖	✖	✖	✖	✖	✖	✓	✓	✖	✖
0x20 / 32	✖	✖	✓	✖	✓	✖	✖	✓	✖	✖	✓	✖	✓
0x21 / 33	✖	✖	✓	✖	✓	✖	✖	✓	✖	✖	✓	✖	✓
0x22 / 34	✖	✖	✖	✖	✓	✖	✖	✓	✖	✖	✓	✖	✓
0x23 / 35	✖	✖	✖	✖	✓	✖	✖	✓	✖	✖	✓	✖	✓
0x24 / 36	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✓	✖	✓
0x25 / 37	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✓	✖	✓
0x26 / 38	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✓	✖	✓
0x27 / 39	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✓	✖	✓
0x28 / 40	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
0x29 / 41	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
0x2A / 42	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
0x2B / 43	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
0x2C / 44	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
0x2D / 45	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
0x2E / 46	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
0x2F / 47	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
0x40 / 64	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0x41 / 65	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0x42 / 66	✖	✖	✖	✖	✖	✓	✓	✓	✓	✓	✓	✓	✓
0x43 / 67	✖	✖	✖	✖	✖	✓	✓	✓	✓	✓	✓	✓	✓
0x44 / 68	✖	✖	✖	✖	✖	✖	✖	✖	✓	✓	✓	✓	✓
0x45 / 69	✖	✖	✖	✖	✖	✖	✖	✖	✓	✓	✓	✓	✓
0x46 / 70	✖	✖	✖	✖	✖	✖	✖	✖	✓	✓	✓	✓	✓
0x47 / 71	✖	✖	✖	✖	✖	✖	✖	✖	✓	✓	✓	✓	✓
0x48 / 72	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✓	✖
0x49 / 73	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✓	✖
0x4A / 74	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✓	✖
0x4B / 75	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✓	✖
0x4C / 76	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✓	✖
0x4D / 77	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✓	✖
0x4E / 78	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✓	✖
0x4F / 79	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✓	✖

Table 187: Data blocks of the module types for digital output and digital input/output modules

Index	2DO	2DO_2DIA	2DO_2PI-DIA	2DO_4DIA	2DO_4PI-DIA	4DO	4DO_4DIA	4DO_4PI-DIA	8DO	8DO_8DIA	8DO_8PI-DIA	16DO	8DI_8DO
0xA0 / 160	✖	✖	✓	✖	✓	✖	✖	✓	✖	✖	✓	✖	✓
0xC0 / 192	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

13.4.4 Possible Data Blocks for Complex I/O Modules

Table 188: Possible data blocks for complex I/O modules

Index	Data object (s)	Service primitives / Data length
0x00 / 0	Table 0, Data content of register 0 - {0, 1, 2, ... 63}	MSAC1/2_Read / {2, 4, 6, … 128 Byte} [1]
0x01 / 1	Table 0, Data content of register 1 - {1, 2, 3, ... 63}	MSAC1/2_Read / {2, 4, 6, … 126 Byte} [1]
...	...	...
0x1E / 30	Table 0, Data content of register 30 - {30, 31, 32, ... 63}	MSAC1/2_Read / {2, 4, 6, … 68 Byte} [1]
0x1F / 31	Table 0, Data content of register 31 - {31, 32, 33, ... 63}	MSAC1/2_Read / {2, 4, 6, … 66 Byte} [1] MSAC1/2_Write / {2, 4, 6, … 66 Byte} [2]
0x20 /32	Table 0, Data content of register 32 - {32, 33, 34, ... 63}	MSAC1/2_Read / {2, 4, 6, … 64 Byte} [1] MSAC1/2_Write / {2, 4, 6, … 64 Byte} [2]
...	...	...
0x3A / 58	Table 0, Data content of register 58 - {58, 59, 60, ... 63}	MSAC1/2_Read / {2, 4, 6, … 12 Byte} [1] MSAC1/2_Write / {2, 4, 6, … 12 Byte} [2]
0x3B / 59	Table 0, Data content of register 0 – 63	MSAC1/2_Read / {2, 4, 6, … 128 Byte} [1]
0x3C / 60	Diagnostics data channel 0	MSAC1/2_Read / 2 Byte
0x3D / 61	Process input data channel 0	MSAC1/2_Read / n Byte [3]
0x3E / 62	Process output data channel 0	MSAC1/2_Read / n Byte [3], MSAC1/2_Write / n Byte [3]
0x3F / 63	Individual parameter data (iPar-Server-Index)	MSAC1/2_Read / n Byte [4], MSAC1/2_Write / n Byte [4]
0x40 / 64	Table 1, Data content of register 0 - {0, 1, 2, ... 63}	MSAC1/2_Read / {2, 4, 6, … 128 Byte} [1]
0x41 / 65	Table 1, Data content of register 1 - {1, 2, 3, ... 63}	MSAC1/2_Read / {2, 4, 6, … 126 Byte} [1]
...	...	...
0x5E / 94	Table 1, Data content of register 30 - {30, 31, 32, ... 63}	MSAC1/2_Read / {2, 4, 6, … 68 Byte} [1]
0x5F / 95	Table 1, Data content of register 31 - {31, 32, 33, ... 63}	MSAC1/2_Read / {2, 4, 6, … 66 Byte} [1] MSAC1/2_Write / {2, 4, 6, … 66 Byte} [2]
0x60 / 96	Table 1, Data content of register 32 - {32, 33, 34, ... 63}	MSAC1/2_Read / {2, 4, 6, … 64 Byte} [1] MSAC1/2_Write / {2, 4, 6, … 64 Byte} [2]
...	...	...
0x7A / 122	Table 1, Data content of register 58 - {58, 59, 60, ... 63}	MSAC1/2_Read / {2, 4, 6, … 12 Byte} [1] MSAC1/2_Write / {2, 4, 6, … 12 Byte} [2]
0x7B / 123	Table 1, Data content of register 0 - 63	MSAC1/2_Read / {2, 4, 6, … 128 Byte} [1]
0x7C / 124	Diagnostics data channel 1	MSAC1/2_Read / 2 Byte
0x7D / 125	Process input data channel 1	MSAC1/2_Read / n [3] Byte
0x7E / 126	Process output data channel 1	MSAC1/2_Read / n [3] Byte, MSAC1/2_Write / n [3] Byte
0x7F / 127	General Parameter Data (parameter channel)	MSAC1/2_Read / n Byte, MSAC1/2_Write / n Byte
0x80 / 128	Table 2, Data content of register 0 - {0, 1, 2, ... 63}	MSAC1/2_Read / {2, 4, 6, … 128 Byte} [1]
0x81 / 129	Table 2, Data content of register 1 - {1, 2, 3, ... 63}	MSAC1/2_Read / {2, 4, 6, … 126 Byte} [1]
...	...	...

Table 188: Possible data blocks for complex I/O modules

Index	Data object (s)	Service primitives / Data length
0x9E / 158	Table 2, Data content of register 30 - {30, 31, 32, ... 63}	MSAC1/2_Read / {2, 4, 6, … 68 Byte} [1]
0x9F / 159	Table 2, Data content of register 31 - {31, 32, 33, ... 63}	MSAC1/2_Read / {2, 4, 6, … 66 Byte} [1] MSAC1/2_Write / {2, 4, 6, … 66 Byte} [2]
0xA0 /160	Table 2, Data content of register 32 - {32, 33, 34, ... 63}	MSAC1/2_Read / {2, 4, 6, … 64 Byte} [1] MSAC1/2_Write / {2, 4, 6, … 64 Byte} [2]
...	...	...
0xBA / 186	Table 2, Data content of register 58 - {58, 59, 60, ... 63}	MSAC1/2_Read / {2, 4, 6, … 12 Byte} [1] MSAC1/2_Write / {2, 4, 6, … 12 Byte} [2]
0xBB / 187	Table 2, Data content of register 0 - 63	MSAC1/2_Read / {2, 4, 6, … 128 Byte} [1]
0xBC / 188	Diagnostics data channel 2	MSAC1/2_Read / 2 Byte
0xBD / 189	Process input data channel 2	MSAC1/2_Read / n [3] Byte
0xBE / 190 3	Process output data channel 2	MSAC1/2_Read / n [3] Byte, MSAC1/2_Write / n [3] Byte
0xBF / 191	Reserved for expansions	-
0xC0 / 192	Table 3, Data content of register 0 - {0, 1, 2, ... 63}	MSAC1/2_Read / {2, 4, 6, … 128 Byte} [1]
0xC1 / 193	Table 3, Data content of register 1 - {1, 2, 3, ... 63}	MSAC1/2_Read / {2, 4, 6, … 126 Byte} [1]
...	...	...
0xDE / 222	Table 3, Data content of register 30 - {30, 31, 32, ... 63}	MSAC1/2_Read / {2, 4, 6, … 68 Byte} [1]
0xDF / 223	Table 3, Data content of register 31 - {31, 32, 33, ... 63}	MSAC1/2_Read / {2, 4, 6, … 66 Byte} [1] MSAC1/2_Write / {2, 4, 6, … 66 Byte} [2]
0xE0 / 224	Table 3, Data content of register 32 - {32, 33, 34, ... 63}	MSAC1/2_Read / {2, 4, 6, … 64 Byte} [1] MSAC1/2_Write / {2, 4, 6, … 64 Byte} [2]
...	...	...
0xFA / 250	Table 3, Data content of register 58 - {58, 59, 60, ... 63}	MSAC1/2_Read / {2, 4, 6, … 12 Byte} [1] MSAC1/2_Write / {2, 4, 6, … 12 Byte} [2]
0xFB / 251	Table 3, Data content of register 0 - 63	MSAC1/2_Read / {2, 4, 6, … 128 Byte} [1]
0xFC / 252	Diagnostics data channel 3	MSAC1/2_Read / 2 Byte
0xFD / 253	Process input data channel 3	MSAC1/2_Read / n [3] Byte
0xFE / 254	Process output data channel 3	MSAC1/2_Read / n [3] Byte, MSAC1/2_Write / n [3] Byte
0xFF / 255	PROFIBUS IM0 data block IO-Link-Call	MSAC1/2_Read / 64 (n [5]) Byte, MSAC1/2_Write / 64 (n [5]) Byte

[1] The data length depends on the number of requested register objects. Because a register object is organized in 16 bits, the requested amount of data must always be a multiple of 2 bytes. If the amount of data requested exceeds the maximum, the maximum available amount of register objects are returned.

[2] The data length depends on the number of register objects to be written. Because a register object is organized in 16 bits, the amount of data to be written must always be a multiple of 2 bytes.

[3] The data length is based on the configuration of the input or output process image.

[4] The data length depends on the scope of the iParameter set.

[5] The data length depends on the selected IO-Link index/subindex.

13.4.5 Data Blocks of the Module Types for Analog Input/Output Modules

Table 189: Data blocks of the module types for analog input/output modules

Index	2AI	2AI_RA	2AI_2NV	2AI_4NV	2AI_6NV	2AI_8NV	3AI_RA	4AI	4AI_RA	2AO	2AO_RA	4AO	4AO_RA
0x00 / 0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0x01 / 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
...													
0x3B / 59	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0x3C / 60	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0x3D / 61	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✗	✓
0x3E / 62	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✗	✓
0x3F / 63	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0x40 / 64	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0x41 / 65	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
...													
0x7B / 123	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0x7C / 124	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0x7D / 125	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✗	✓
0x7E / 126	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✗	✓
0x7F / 127	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0x80 / 128	✗	✗	✗	✗	✗	✗	✓	✓	✓	✗	✗	✓	✓
0x81 / 129	✗	✗	✗	✗	✗	✗	✓	✓	✓	✗	✗	✓	✓
...													
0xBB / 187	✗	✗	✗	✗	✗	✗	✓	✓	✓	✗	✗	✓	✓
0xBC / 188	✗	✗	✗	✗	✗	✗	✓	✓	✓	✗	✗	✓	✓
0xBD / 189	✗	✗	✗	✗	✗	✗	✓	✓	✓	✗	✗	✗	✓
0xBE / 190	✗	✗	✗	✗	✗	✗	✓	✓	✓	✗	✗	✗	✓
0xBF / 191	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xC0 / 192	✗	✗	✗	✗	✗	✗	✗	✓	✓	✗	✗	✓	✓
0xC1 / 193	✗	✗	✗	✗	✗	✗	✗	✓	✓	✗	✗	✓	✓
...													
0xFB / 251	✗	✗	✗	✗	✗	✗	✗	✓	✓	✗	✗	✓	✓
0xFC / 252	✗	✗	✗	✗	✗	✗	✗	✓	✓	✗	✗	✓	✓
0xFD / 253	✗	✗	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗	✓
0xFE / 254	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✓	✓

13.4.6 Data blocks of the module types for analog input/output modules

Table 190: Data blocks of the module types for up/down counter, pulse width output module, as well as path and angle measurement

Index	CNT_1	CNT_2	PWM	SSI	SSI_RA	ENC_RA	DII_RA
0x00 / 0	✓	✓	✓	✓	✓	✓	✓
0x01 / 1	✓	✓	✓	✓	✓	✓	✓
0x3B / 59	✓	✓	✓	✓	✓	✓	✓
0x3C / 60	✓	✓	✓	✓	✓	✓	✓
0x3D / 61	✓	✓	✓	✓	✓	✓	✓
0x3E / 62	✓	✓	✓	✗	✓	✓	✓
0x40 / 64	✗	✓	✓	✗	✗	✗	✗
0x41 / 65	✗	✓	✓	✗	✗	✗	✗
0x7B / 123	✗	✓	✓	✗	✗	✗	✗
0x7C / 124	✗	✓	✓	✗	✗	✗	✗
0x7D / 125	✗	✓	✓	✗	✗	✗	✗
0x7E / 126	✗	✓	✓	✗	✗	✗	✗
0x80 / 128	✗	✗	✗	✗	✗	✗	✗
0x81 / 129	✗	✗	✗	✗	✗	✗	✗
0xBB / 187	✗	✗	✗	✗	✗	✗	✗
0xBC / 188	✗	✗	✗	✗	✗	✗	✗
0xBD / 189	✗	✗	✗	✗	✗	✗	✗
0xBE / 190	✗	✗	✗	✗	✗	✗	✗
0xC0 / 192	✗	✗	✗	✗	✗	✗	✗
0xC1 / 193	✗	✗	✗	✗	✗	✗	✗
0xFB / 251	✗	✗	✗	✗	✗	✗	✗
0xFC / 252	✗	✗	✗	✗	✗	✗	✗
0xFD / 253	✗	✗	✗	✗	✗	✗	✗
0xFE / 254	✗	✗	✗	✗	✗	✗	✗

13.4.7 Data Blocks of the Module Types for Serial Interface Modules, Data Exchange Modules and Radio Receiver I/O Modules

Table 191: Data blocks of the module types for serial interface modules, data exchange modules and radio receiver I/O modules

Index	SER_3D	SER_5D	SER_6D	SER_22D	SER_46D	DXCH	DXCH_RA	ENOC	BT_10D	BT_22D	BT_46D
0x00 / 0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0x01 / 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0x3B / 59	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0x3C / 60	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0x3D / 61	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0x3E / 62	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0x3F / 63	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0x40 / 64	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0x41 / 65	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0x7B / 123	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0x7C / 124	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0x7D / 125	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0x7E / 126	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0x7F / 127	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0x80 / 128	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0x81 / 129	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xBB / 187	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xBC / 188	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xBD / 189	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xBE / 190	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xBF / 191	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xC0 / 192	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xC1 / 193	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xFB / 251	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xFC / 252	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xFD / 253	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xFE / 254	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗

13.4.8 Data Blocks of the Module Types for DALI/DSI Master Modules, AS Interface Master Modules, MP Bus Master Modules and IO-Link Master Modules

Table 192: Data blocks of the module types for DALI/DSI master modules, AS interface master modules, MP bus master modules and IO-Link master modules

Index	DALI	ASI_10D	ASI_18D	ASI_22D	ASI_30D	ASI_38D	ASI_46D	MP_BUS	IOL_2D	IOL_4D	IOL_6D	IOL_8D	IOL_12D	IOL_16D	IOL_20D
0x00 / 0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0x01 / 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0x3B / 59	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0x3C / 60	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0x3D / 61	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0x3E / 62	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0x3F / 63	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0x40 / 64	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0x41 / 65	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0x7B / 123	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0x7C / 124	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0x7D / 125	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0x7E / 126	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0x7F / 127	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0x80 / 128	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0x81 / 129	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xBB / 187	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xBC / 188	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xBD / 189	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xBE / 190	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xBF / 191	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xC0 / 192	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xC1 / 193	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xFB / 251	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xFC / 252	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xFD / 253	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xFE / 254	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
0xFF / 255	✗	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓

13.4.9 Data Blocks of the Module Types for Vibration Monitoring, RTC Modules, Stepper Modules, DC Drive Controllers and PROFIsafe I/O Modules

Index	VIB_IO	RTC	STEPPER	DC_DRIVE	PSAFE	PSAFE_iPar
0x00 / 0	✓	✓	✓	✓	✓	✓
0x01 / 1	✓	✓	✓	✓	✓	✓
0x3B / 59	✓	✓	✓	✓	✓	✓
0x3C / 60	✓	✓	✓	✓	✓	✓
0x3D / 61	✓	✓	✓	✓	✓	✓
0x3E / 62	✓	✓	✓	✓	✓	✓
0x3F / 63	✗	✗	✗	✗	✓	✓
0x40 / 64	✓	✗	✗	✗	✗	✗
0x41 / 65	✓	✗	✗	✗	✗	✗
0x7B / 123	✓	✗	✗	✗	✗	✗
0x7C / 124	✓	✗	✗	✗	✗	✗
0x7D / 125	✓	✗	✗	✗	✗	✗
0x7E / 126	✓	✗	✗	✗	✗	✗
0x7F / 127	✗	✗	✗	✗	✓	✓
0x80 / 128	✓	✗	✗	✗	✗	✗
0x81 / 129	✓	✗	✗	✗	✗	✗
0xBB / 187	✓	✗	✗	✗	✗	✗
0xBC / 188	✓	✗	✗	✗	✗	✗
0xBD / 189	✓	✗	✗	✗	✗	✗
0xBE / 190	✓	✗	✗	✗	✗	✗
0xBF / 191	✗	✗	✗	✗	✗	✗
0xC0 / 192	✓	✗	✗	✗	✗	✗
0xC1 / 193	✓	✗	✗	✗	✗	✗
0xFB / 251	✓	✗	✗	✗	✗	✗
0xFC / 252	✓	✗	✗	✗	✗	✗
0xFD / 253	✓	✗	✗	✗	✗	✗
0xFE / 254	✓	✗	✗	✗	✗	✗

13.5 Data Blocks for Identification and Maintenance Purposes (I&M)

These datasets allow to read the device information that may be required for the system documentation and for service purposes.

13.5.1 Fieldbus Coupler, Slots 0 and 1

Table 193: I&M0 of the fieldbus coupler 750-333

Byte-offset	Information		Description
0	0x00	0x00	Manufacturer specific
2	0x00	0x00	
4	0x00	0x00	
6	0x00	0x00	
8	0x00	0x00	
10	0x01	0x1D	Manufacturer ID WAGO **285_D**
12	**0x37**	**0x35**	WAGO order number filled out with spaces „750-333 “
14	**0x30**	**0x2D**	
16	**0x33**	**0x33**	
16	**0x33**	0x20	
26	0x20	0x20	
...	...	...	
30	0x20	0x20	
32	**0xKK**	**0xLL**	MAC-ID WAGO filled out with spaces “**KLMNOPQ** ”
34	**0xMM**	**0xNN**	
36	**0xOO**	**0xPP**	
38	**0xQQ**	0x20	
40	0x20	0x20	
42	0x20	0x20	
44	0x20	0x20	
46	0x20	0x20	
48	0x00	0xHH	Hardware version HH
50	0x56	0xAA	Firmware version ’V’ AA.BB.CC
52	0xBB	0xCC	
54	0x00	0x01	
56	0x00	0x00	
58	0x00	0x00	
60	0x01	0x01	
62	0x00	0x1E	I&M1 to I&M4 are supported

Table 194: I&M1 of the fieldbus coupler 750-333

Byte-offset	Information		Description
0	0x00	0x00	Manufacturer specific (cannot be modified)
2	0x00	0x00	
4	0x00	0x00	
6	0x00	0x00	
8	0x00	0x00	
10	0x20	0x20	Label function (default setting)
12	0x20	0x20	
...	...	...	
40	0x20	0x20	
42	0x20	0x20	Label installation location (default setting)
44	0x20	0x20	
...	...	...	
62	0x20	0x20	

Table 195: I&M2 of the fieldbus coupler 750-333

Byte-offset	Information		Description
0	0x00	0x00	Manufacturer specific (cannot be modified)
2	0x00	0x00	
4	0x00	0x00	
6	0x00	0x00	
8	0x00	0x00	
10	0x20	0x20	Installation date (default setting)
12	0x20	0x20	
...	...	...	
24	0x20	0x20	
26	0x20	0x20	Reserved (default setting)
28	0x20	0x20	
...	...	...	
62	0x20	0x20	

Table 196: I&M3 of the fieldbus coupler 750-333

Byte-offset	Information		Description
0	0x00	0x00	Manufacturer specific (cannot be modified)
2	0x00	0x00	
4	0x00	0x00	
6	0x00	0x00	
8	0x00	0x00	
10	0x20	0x20	Identifier (default setting)
12	0x20	0x20	
...	...	...	
62	0x20	0x20	

Table 197: I&M4 of the fieldbus coupler 750-333

Byte-offset	Information		Description
0	0x00	0x00	Manufacturer specific (cannot be modified)
2	0x00	0x00	
4	0x00	0x00	
6	0x00	0x00	
8	0x00	0x00	
10	0x20	0x20	Signature (default setting)
12	0x20	0x20	
...	...	...	
62	0x20	0x20	

13.5.2 IO-Link master (75x-657), slot 2 to 64

Table 198: I&M0 of the IO-Link master 75x-657

Byte-offset	Information		Description
0	0x00	0x00	Manufacturer specific (cannot be modified)
2	0x00	0x00	
4	0x00	0x00	
6	0x00	0x00	
8	0x00	0x00	
10	0x01	0x1D	Manufacturer ID WAGO **285_D**
12	**0x37**	**0x35**	WAGO order number filled out with spaces „75x-657 “
14	**0x3x**	**0x2D**	
16	**0x36**	**0x35**	
16	**0x37**	0x20	
26	0x20	0x20	
...	...	...	
30	0x20	0x20	
32	**0xKK**	**0xLL**	MAC-ID WAGO filled out with spaces “**KLMNOPQR** ”
34	**0xMM**	**0xNN**	
36	**0xOO**	**0xPP**	
38	**0xQQ**	**0xRR**	
40	0x20	0x20	
42	0x20	0x20	
44	0x20	0x20	
46	0x20	0x20	
48	0x00	0xHH	Hardware version HH
50	0x56	0xAA	Firmware version 'V' AA.BB.CC
52	0xBB	0xCC	
54	0x00	0x01	
56	0x00	0x00	
58	0x00	0x00	
60	0x01	0x01	
62	0x00	0x1F	I&M1 to I&M4 and IO-Link profile-specific I&M are supported

Table 199: I&M1 of the IO-Link master 75x-657

Byte-offset	Information		Description
0	0x00	0x00	Manufacturer specific (cannot be modified)
2	0x00	0x00	
4	0x00	0x00	
6	0x00	0x00	
8	0x00	0x00	
10	0x20	0x20	Label function (default setting)
12	0x20	0x20	
...	...	...	
40	0x20	0x20	
42	0x20	0x20	Label installation location (default setting)
44	0x20	0x20	
...	...	...	
62	0x20	0x20	

Table 200: I&M2 of the IO-Link master 75x-657

Byte-offset	Information		Description
0	0x00	0x00	Manufacturer specific (cannot be modified)
2	0x00	0x00	
4	0x00	0x00	
6	0x00	0x00	
8	0x00	0x00	
10	0x20	0x20	Installation date (default setting)
12	0x20	0x20	
...	...	...	
24	0x20	0x20	
26	0x20	0x20	Reserved (default setting)
28	0x20	0x20	
...	...	...	
62	0x20	0x20	

Table 201: I&M3 of the IO-Link master 75x-657

Byte-offset	Information		Description
0	0x00	0x00	Manufacturer specific (cannot be modified)
2	0x00	0x00	
4	0x00	0x00	
6	0x00	0x00	
8	0x00	0x00	
10	0x20	0x20	Identifier (default setting)
12	0x20	0x20	
...	...	...	
62	0x20	0x20	

Table 202: I&M4 of the IO-Link master 75x-657

Byte-offset	Information		Description
0	0x00	0x00	Manufacturer specific (cannot be modified)
2	0x00	0x00	
4	0x00	0x00	
6	0x00	0x00	
8	0x00	0x00	
10	0x20	0x20	Signature (default setting)
12	0x20	0x20	
...	...	...	
62	0x20	0x20	

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