



FACTORY AUTOMATION

Manual

IPT-FP with U-P□-R4

Read/Write Head with Addressable
Serial Interface



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IDENT-I System P • IPT-FP with U-P□-R4 Notes

Date of Issue 03.07.2000

1 Declaration of Conformity

The devices IPT-FP and U-P□-R4 within the inductive identification system IDENT-I System P have been developed and manufactured with cognaisance of the applicable European standards and directives.



An appropriate declaration of conformity can be demanded from the manufacturer.

Note

The manufacturer of the product, Pepperl+Fuchs GmbH, D-68301 Mannheim, operates a certificated quality assurance system in accordance with ISO 9001.



2 Symbols used in this document



Warning

This symbol warns of danger.

If the instruction given in this warning is not heeded the result could be the injury or death of personnel and/or the severe damage or destruction of equipment.



Attention

This symbol warns of a possible fault.

If the instruction given in this warning is not heeded, the device and any plant or systems connected to it could develop a fault or even fail completely.



Note

This symbol directs attention to important information.

3 Safety

3.1 Intended use



Warning

The protection of operating personnel and plant is not guaranteed if the equipment is used for a purpose for which it was not intended.

The devices IPT-FP and U-P□-R4 must only be operated by appropriately trained personnel in accordance with this operating instruction.

3.2 General safety instructions



Warning

Operation other than that described in these instructions may place the function and safety of the device and any connected system at risk.

The connection of the device and maintenance work under power must only be carried out by a qualified electrical specialist.

If faults cannot be eliminated, the device is to be taken out of operation and protected against further unintentional operation.

Repairs must only be carried out by the manufacturer. Access inside the device and modifications to it are not permissible and render the guarantee null and void.

The operator is responsible for complying with local safety regulations.

4 Product description



Figure 4.1: IPT-FP with lower section U-P3-R4 and lower section U-P6-R4

4.1 Delivery package

Read/write station IPT-FP:

- 1 Read/write station IPT-FP
- 1 Manual

Lower section U-P3-R4 and U-P3V4A-R4¹:

- 1 Lower section
- 1 Product leaflet

Lower section U-P6-R4¹:

- 1 Lower section
- 1 Product leaflet
- 1 Cover, with screws
- 1 Sticker for the bus address
- 1 Grounding screw
- 1 Serrated lock washer
- 2 Crimp connectors

4.2 Range of application

The system is suitable for applications including the following:

- Automation
- Material flow control in production
- Acquisition of operating data
- Access control
- Identification of e.g. storage vessels, pallets, work piece carriers, refuse containers, tanks, containers

1. The lower sections U-P3-R4, U-P3V4A-R4 and U-P6-R4 must be ordered separately.

4.3 Display LEDs

The display LEDs are located on the front of the read/write station IPT-FP

- green "Power on"
- yellow "IPC detected"

4.4 Accessory/Product family

The IDENT-I System P inductive identification system from Pepperl+Fuchs offers various combination options using the individual components.



Figure 4.2: Overview of the structure of the inductive identification system IDENT-I System P.



Note

Detailed information on the components of the identification system IDENT-I System P can be found in the Sensor systems 1 catalogue.

5 Installation

5.1 Storage and transportation

The device should be well packed for transportation and storage, so that protection is provided against shock and dampness. Optimum protection is afforded by the original packaging. In addition, the permissible ambient conditions must prevail (see section 8.1).

5.2 Unpacking

Inspect the contents for damage. In the event of damage, the postal service or goods transport service should be informed and the supplier notified.

Inspect the contents of the delivery package against your order and the delivery documents:

- Quantity supplied
- Device type and version in accordance with the type plate
- Accessories
- Manual/manuals

Retain the original packaging in case the items have to be stored or further transported at a later date.

In the event of problems arising, please contact Pepperl+Fuchs GmbH.

5.3 EMC Screening concept

Lower sections U-P3-R4 and U-P3V4A-R4

The lower sections U-P3-R4 and U-P3V4A-R4 must be grounded. The connecting leads must not be screened.



Note

Under normal circumstances, it is not necessary to screen the connecting lead. However, if the device is likely to be used in an environment in which it will be subjected to severe interference effects, it can be a sensible precaution to protect the interface by means of a screened lead. When screening a lead, each side of the screen should be connected to ground with low resistance.

If you use leads with a double screen, e.g. wire mesh and metallised foil, you must connect the screens together at the ends of the leads with low resistance.

Power supply cables emit significant interference, e.g. the starting current of a 3-phase current electric motor. For this reason, you should avoid the parallel laying of power supply cables with data and signal cables, particularly in the same cable duct.

The cable screening is screwed to the ground terminal on the lower section.

Lower section U-P6-R4

The screening of cables provides for the discharge of electromagnetic interference. When screening a cable, both sides of the screen must be connected to the ground with low resistance and low inductance.



If you use leads with a double screen, e.g. wire mesh and metallised foil, you must connect the screens together at the ends of the leads with low resistance.

Note

Power supply cables emit significant interference, e.g. the starting current of a 3-phase electric motor. For this reason, you should avoid the parallel laying of power supply cables with data and signal cables, particularly in the same cable duct.

In order to correctly connect the EMC screening with the PG cable gland in the U-P6-R4 lower section, in accordance with DIN VDE 0871/6.78, the following steps must be carried out:

- Strip the outer sheathing of the cable end over a length of approx. 10 mm.
- Lightly flare the screen (1) and slide it over the cone (2).
- Pull the seal insert (3) over the screen and cone.
- Screw on the PG cable gland.

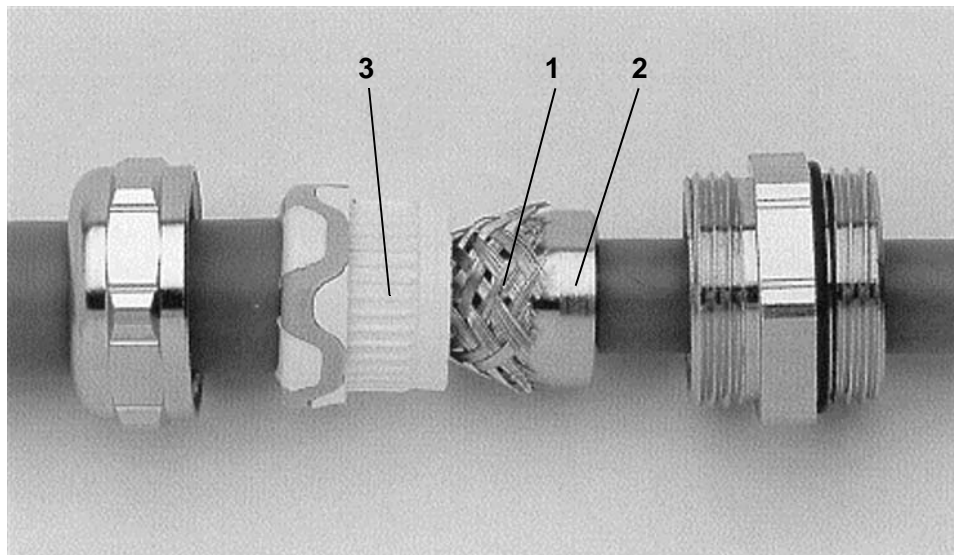


Figure 5.1: Screening in accordance with EMC

In order to secure a conductive contact with the housing, the PG cable gland is fixed to the U-P6-R4 lower section by means of a self-tapping nut.

Once unscrewed, self-tapping nuts cannot be used again!

5.4 Ground connection on the lower section U-P6-R4

The ground connection on the U-P6-R4 lower section is positioned on the lower left, near the cable entries. The PE conductor is screwed to the housing using a crimp connector. In order to guarantee a safe ground, the serrated washer must be mounted between the crimp connector and the housing.

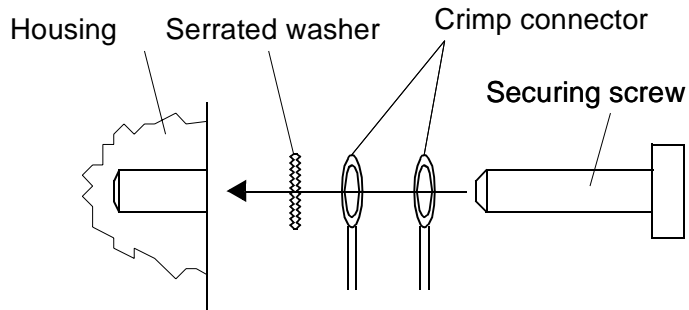


Figure 5.2: The principle of ground connection

It is recommended, that a lead having a cross-section of at least 4 mm² be used for the PE conductor.

The internal PE connection is conductively attached to the housing. However, from the point of view of screening, connection to the outside of the housing is preferable.

5.5 Dismantling, packing and re-packing

If the device is to be stored for later re-use, the device should be packed in such a way as to ensure protection from shock. Optimum protection is afforded by the original packaging.

Disposal



Note

Electronic waste is classified as special refuse. Observe the local regulations for the disposal of such waste.

The IPT-FP read/write station contains no internal batteries that would have to be removed prior to disposal.

6 Commissioning



Warning

Before commissioning, ensure that no danger to the plant to which the device is connected can arise, due for example to the uncontrolled initiation of processes.

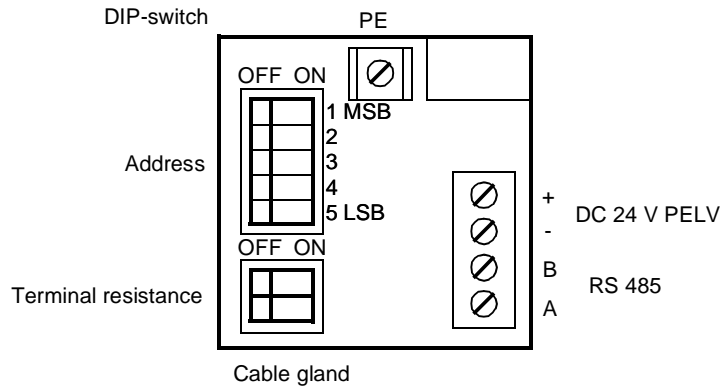


Figure 6.1: Connection of the lower sections U-P3-R4 and U-P3V4A-R4

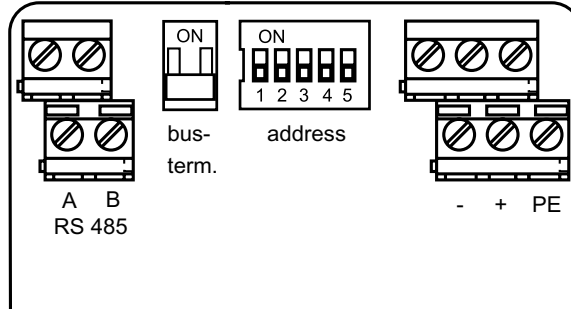


Figure 6.2: Connection of the lower sections U-P6-R4



Attention

Before commissioning, check once again that the connections are correct.

After connecting the supply voltage, the green LED must light. Configure the read/write station with the system commands described in section 7. The factory set transfer rate is 9600 baud and no timeout. "Autodetect" is set as the data carrier type.

7 Instruction

To operate the read/write station, commands are sent to the station. The station reacts by returning a confirmation of the reception up to the reset command. Data are fetched by means of "get data" commands.

The commands contain the number of the read/write station <DeviceNo>, so that individual stations can be addressed in a multidrop connection.

To avoid a number of stations communicating simultaneously, the master or host must wait for a response after sending a command (other than the reset command). This takes place after a maximum of 250 ms. If the master has not received an answer in this period of time, it means that no read/write station with the requested head number is functioning.

All system settings received from the interface are stored in non-volatile memory. They automatically become active following a reset.

All commands are terminated with the characters <CHCK> = "Check sum" and <ETX> = "End of text". These are provided for data security during the serial transfer. For simple operation with a standard terminal, the read station also accepts a #<CR>[<LF>] instead of <CHCK><ETX>.

7.1 Overview of commands

System commands

Description of command	Command	
get data	gd	Page 14
version	ve	Page 14
change tag	ct	Page 14
quit	qu	Page 15
configure interface	ci	Page 15
reset	rs	Page 15
configuration, store	cs	Page 16

Read/write commands

Read data

Description of command	Command	
single read	sr	Page 16
auto read	ar	Page 16
buffered read	br	Page 16
enhanced buffered read	er	Page 17

Write data

Description of command	Command	
single write	sw	Page 17
auto write	aw	Page 17
buffered write	bw	Page 17
enhanced buffered write	ew	Page 17

Fixed code

Description of command	Command	
single read fixed code	sf	Page 18
auto read fixed code	af	Page 18
buffered read fixed code	bf	Page 18
enhanced buffered read fixed code	ef	Page 18

Special command modes

Configuration IPC03

Description of command	Command	
single configure	sc	Page 21
auto configure	ac	Page 21
buffered configure	bc	Page 21
enhanced buffered configure	ec	Page 21
single get configuration	sg	Page 21
auto get configuration	ag	Page 22
buffered get configuration	bg	Page 22
enhanced buffered get configuration	eg	Page 22

IPC03 password mode

Description of command	Command	
password mode	pm	Page 22
password set	ps	Page 22
password change	pc	Page 23

Write fixed code IPC10

Description of command	Command	
single write fixed code	sx	Page 23
auto write fixed code	ax	Page 23
buffered write fixed code	bx	Page 24
enhanced buffered write fixed code	ex	Page 24

7.2 System commands

get data:

Command: "gd" <DeviceNo> <CHCK> <ETX>
 Response: <Status> <DeviceNo>
 <ExecCounter>{<Data>}<CHCK> <ETX>

Fetch the data from the read station.

Data are only available as a response to read commands. On write commands, the data part is inapplicable. **Note:** After a reset, the status "2" (Start message) is returned in response to a get data command.

Version:

Command: "ve" <DeviceNo> <CHCK> <ETX>
 Response: <Status> <DeviceNo>
 (c) P+F IDENT-I
 <TypeNumber> <CR> <LF>
 <PartNo> <CR><LF>
 <SW-No> <Date> <CR> <LF>
 <CHCK> <ETX>

The software version is transferred on this command.

change tag:

Command: "ct" <DeviceNo> <TagType> <CHCK> <ETX>
 Response: <Status> <DeviceNo> <CHCK> <ETX>

This command is used to inform the read station which tag it is to communicate with. On delivery, the status of the read heads is set at type "00"

The following types of data carriers are currently supported:

Tag type		Description	Inset chip	Access	<WordAddr>	Bits
High byte	Low byte					
0	0	Auto detect				
0	1	IPC01	Philips PCF7930	R/W	00 ... 18	768
0	2	IPC02	μEM V4001	fixed code		40
0	3	IPC03	μEM V4050/64	R/W fixed code	00 ... 1D	928 32
1	0	IPC10	Nova	R/W	00	96

With type <TagType> "00", mixed operation with different code/data carriers is possible. Since the read/write station for the auto detect requires a significantly longer amount of time, only static read and write is sensible in this mode.

In the "Auto detect" operating mode, the word start address and word number parameters are first checked when a data carrier is read or written to, since the memory areas are different for the various types of data carriers. The error message "Status 4" can therefore first occur when a data carrier is in front of the read/write station (see section 7.7).

quit:

Command: "qu" <DeviceNo> <CHCK> <ETX>
Response: <Status> <DeviceNo> <CHCK> <ETX>

The running buffered, enhanced-buffered or auto command of the specified read/write station is aborted.

configure interface:

Command: "ci" <DeviceNo> <Timeout>,<Baud> <CHCK>
<ETX>
Response: <Status> <DeviceNo> <CHCK> <ETX>

The timeout and the baudrate are set with this command. The values are stored in non-volatile memory. A change is always only effective after a reset.

The timeout is the period of time after which no further characters in a command are awaited. The user receives an error message on expiry of the timeout. The time must be set to "0" in order to deactivate the timeout.

The number of data bits is always 8. A parity bit is never used.

The following settings are possible:

<Timeout>: "0" ... "100" (x 100 ms, timeout in 100 ms steps)
<Baud>: "1200" , "2400" , "4800" , "9600" , "19200" , 38400"

A timeout of "0" and a baudrate of "9600" are prescribed as standard values.

reset:

Command: "rs" <DeviceNo> <CHCK> <ETX>
Response: none

Read station reset:

This results in the system settings being reloaded from the non-volatile memory. Following a successful reset the status is "2" (Start message), which can be interrogated with a get data command!

configuration store:

Command: "cs" <DeviceNo> <Param> <CHCK> <ETX>

Response: <Status> <DeviceNo> <CHCK> <ETX>

If <Param> = "1", in this setting, the next command entered is secured in the non volatile memory. This command is also carried out. Following a reset, it automatically becomes active again.

<Param> = "0" deletes the stored command.

7.3 Read/write commands

Code or data carrier	Access	Address range <WordAddr>	Data range <WordNum>	Memory size in bytes
IPC01	Read/write	0000 ... 0017	01 ... 18	96
IPC02	fixed code	-	-	5
IPC03	Read/write	0000 ... 001C	01 ... 1D	116
IPC03	fixed code	-	-	4
IPC10	Read/write	0	1.3	12

single read:

Command: "sr" <DeviceNo> <WordAddr> <WordNum>
<CHCK> <ETX>

Response: <Status> <DeviceNo> <CHCK> <ETX>

One attempt is made to read the 32 bit words <WordNum> from the address <WordAddr>.

auto read:

Command: "ar" <DeviceNo> <WordAddr> <WordNum>
<CHCK> <ETX>

Response: <Status> <DeviceNo> <CHCK> <ETX>

Attempts are made until successful, to read 32 bit words <WordNum> from the address <WordAddr>.

buffered read:

Command: "br" <DeviceNo> <WordAddr> <WordNum>
<CHCK> <ETX>

Response: <Status> <DeviceNo> <CHCK> <ETX>

A continuous attempt is made <WordNum> to read 32 bit words from the address <WordAddr>. Only changed data is transferred via the interface, i.e. if a new data carrier is read, or if a data carrier is read after none have been in the read range.

enhanced buffered read:

Command: "er" <DeviceNo> <WordAddr> <WordNum>
<CHCK> <ETX>
Response: <Status> <DeviceNo> <CHCK> <ETX>

A continuous attempt is made <WordNum> to read 32 bit words from the address <WordAddr>. Changed data is transferred via the interface. When a data carrier leaves the read range, the Status "5" is output.

single write:

Command: "sw" <DeviceNo> <WordAddr> <WordNum>
<Data> <CHCK> <ETX>
Response: <Status> <DeviceNo> <CHCK> <ETX>

One attempt is made to write 32 bit words <WordNum> from address <WordAddr> to.

auto write:

Command: "aw" <DeviceNo> <WordAddr> <WordNum>
<Data> <CHCK> <ETX>
Response: <Status> <DeviceNo> <CHCK> <ETX>

An attempt is made until successful, to write <WordNum> 32 bit words from address <WordAddr>.

buffered write:

Command: "bw" <DeviceNo> <WordAddr> <WordNum>
<Data> <CHCK> <ETX>
Response: <Status> <DeviceNo> <CHCK> <ETX>

An attempt is made until successful, to write <WordNum> 32 bit words from address <WordAddr>. After each successful write operation, the answer is sent and then a reset is made to continuous read. Thereafter the same data carrier is read, until it leaves the read/write range or a new data carrier appears in front of the read/write station. Then the command starts again with attempts to write.

enhanced buffered write:

Command: "ew" <DeviceNo> <WordAddr> <WordNum>
<Data> <CHCK> <ETX>
Response: <Status> <DeviceNo> <CHCK> <ETX>

This command is carried out as for the buffered write command, only the Status "5" is output if the data carrier leaves the read range.

single read fixed code:

Command: "sf" <DeviceNo> <CHCK> <ETX>

Response: <Status> <DeviceNo> <CHCK> <ETX>

One attempt is made to read a fixed code.

auto read fixed code:

Command: "af" <DeviceNo> <CHCK> <ETX>

Response: <Status> <DeviceNo> <CHCK> <ETX>

An attempt is made to read, until a fixed code has been detected.

buffered read fixed code:

Command: "bf" <DeviceNo> <CHCK> <ETX>

Response: <Status> <DeviceNo> <CHCK> <ETX>

The fixed code continues to be read. Only changed data are transferred via the interface.

enhanced buffered read fixed code:

Command: "ef" <DeviceNo> <CHCK> <ETX>

Response: <Status> <DeviceNo> <CHCK> <ETX>

This command behaves as the buffered-read fixed code command. The Status "5" is output if the code or data carrier leaves the read range.

7.4 Configuration commands (IPC03)



These commands can only be used when data carrier type 03 (IPC03) is set. They cannot be used in the autodetect mode (mixed operation, data carrier type 00)!

Note

The memory of the data carrier IPC03 is constructed as follows:

Address	Meaning	<WordAddr>	<ConfAddr>	Remarks
Word 0	Password	-	-	Write only
Word 1	Protection word	-	"1"	Read/write
Word 3	Control word	-	"2"	Read/write
Word 3...31	Data range	"00" ... "1C"	-	Read/write
Word 32	Device serial number	"1D"	-	Read only
Word 33	Device identification	"1E"	-	Read only

Each "word" comprises 32 bits. The IPC03 has a "Protection word" and a "Control word". Access to both words can only be obtained with the correct password. The individual bits have the following meaning:

Control word

Bit	Meaning
0 ... 7	Read range-start
8 ... 15	Read range-end
16	Password protection on/off
17	Read-after-Write operating mode on/off
18 ... 31	freely usable

Protection word

Bit	Meaning
0 ... 7	First read-protected word
8 ... 15	Last read-protected word
16 ... 23	First write-protected word
24 ... 31	Last write-protected word

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In the case of the Control and Protection Word, it should be noted that when communicating a word, the highest value byte is transferred first and the lowest value byte last. When specifying the read and write protected words have the following numerical values:

- 00 Password
- 01 Protection word
- 02 Control word
- 03 1st Data word
- 04 2nd Data word
-
- 1F 29th Data word

It is possible to protect the Control and Protection words before writing. In this case the configuration cannot be changed again.

Access to the data in the data range can be obtained with the read commands and statements for the desired address and data numbers described above (selective read mode).

As soon as the data carrier is supplied with power, it sends data from the data range that is defined by the start and end of the read range (Standard read mode). The data range between the read range start and end can be read with the read commands "single read", "auto read", "buffered read" and "enhanced buffered read" if <WordAddr> is set to "0000" and <WordNum> is set to "00".

If the password protection is switched off, every data word that lies outside the write protected range can be written in. If a word is to be written in this range, the "Protection word" must be changed accordingly.

With the password protection switched on, every data word can be written in that lies outside the write protected range. The prerequisite is that the correct password has been set with the password-set command and the password mode has been switched on with the password mode command.

If the password protection is switched off, then every data word can be read.

With the password protection switched on, the read-protected range is active, i.e. this range can only be read from if the correct password has been set with the password set command and the password-mode has been switched on with the password mode command. If the read-protected range is read with the password mode switched off, the data are set to "0 x 000".

The read-after-write operating mode is not used by this read/write station, so that this bit has no significance here.

The start and end, respectively, of the read-protected and write-protected range are fixed with the "Protection word".

single configuration:

Command: "sc" <DeviceNo> <ConfAddr> <Data> <CHCK>
<ETX>
Response: <Status> <DeviceNo> <CHCK> <ETX>

One attempt is made to write a word in the configuration range from address <ConfAddr>. In order to write in the configuration range, the password-mode must be active.

auto configuration:

Command: "ac" <DeviceNo> <ConfAddr> <Data>
<CHCK> <ETX>
Response: <Status> <DeviceNo> <CHCK> <ETX>

An attempt is made until successful, to read a word in the configuration range from address <ConfAddr>.

buffered configuration:

Command: "bc" <DeviceNo> <ConfAddr> <Data>
<CHCK> <ETX>
Response: <Status> <DeviceNo> <CHCK> <ETX>

One attempt is made to write a word in the configuration range at address <ConfAddr>. After each successful write, the response is sent and the system waits until a new data carrier is within the detection range. The command sequence then starts again. In order to write in the configuration range, the password-mode must be active.

enhanced buffered configuration:

Command: "ec" <DeviceNo> <ConfAddr> <Data>
<CHCK> <ETX>
Response: <Status> <DeviceNo> <CHCK> <ETX>

This command behaves as the buffered-configure command; the status "5" is output when the data carrier leaves the read range.

single get configuration:

Command: "sg" <DeviceNo> <ConfAddr> <Data>
<CHCK> <ETX>
Response: <Status> <DeviceNo> <CHCK> <ETX>

One attempt is made to read a word in the configuration range ("Protection word" or "Control word") from address <ConfAddr>.

auto get configuration:

Command: "ag" <DeviceNo> <ConfAddr> <Data>
<CHCK> <ETX>

Response: <Status> <DeviceNo> <CHCK> <ETX>

An attempt is made to read a word in the configuration range from address <ConfAddr>.

buffered get configuration:

Command: "bg" <DeviceNo> <ConfAddr> <Data>
<CHCK> <ETX>

Response: <Status> <DeviceNo> <CHCK> <ETX>

A continuous attempt is made to read a word in the configuration range from address <ConfAddr>. Only changed data is transferred via the interface.

enhanced buffered get configuration:

Command: "ag" <DeviceNo> <ConfAddr> <Data>
<CHCK> <ETX>

Response: <Status> <DeviceNo> <CHCK> <ETX>

This command behaves as the buffered-get-configuration command, only the status "5" is output when the data carrier leaves the read range.

7.5 Password mode of the IPC03



Note

The password is a 32 bit word that is set to "0" before a new IPC03 data carrier leaves the factory. The password cannot be read. In order to write the password, the "Control word" and the "Protection word" the operation must always be in the password mode.

password mode:

Command: "pm" <DeviceNo> <Mode> <CHCK> <ETX>

Response: <Status> <DeviceNo> <CHCK> <ETX>

Activated (Mode = "1") and deactivated (Mode = "0"), the password mode of the read station. In the password mode, the password is transferred to the data carrier before each read/write access. If a data carrier is addressed with an incorrect password, then further access is also denied to data ranges for which no password protection is set.

password set:

Command: "ps" <DeviceNo> <Password> <CHCK><ETX>

Response: <Status> <DeviceNo> <CHCK> <ETX>

Sets the password that the read station communicates to the data carrier in the password mode.

password change:

Command: "pc" <DeviceNo> <Password old> <Password
new> <CHCK> <ETX>
Response: <Status> <DeviceNo> <CHCK> <ETX>

Changes the password in a data carrier. First the old and then the new password has to be entered. If the password has been written successfully, then the password in the read station is also changed. The command password set is no longer necessary. The IPC03 password can also be changed when the password mode is deactivated.

7.6 Commands for the IPC10 (Nova-Chip)

The IPC10 data carrier is formatted during the first write process. It can therefore only be read if it has previously been written to.

The word start address is set to "0" for the write and read commands. The number of words can be 1 or 3. The number of words is set to "0" for the read commands, since the number of words read is exactly the same as the number of words that has previously been written.

An IPC10 can be programmed so that it behaves as an IPC02. The commands sx, ax, bx, and ex are used for this purpose. This programming is carried out once only, i.e. it cannot be reversed (the once written code cannot be overwritten). The code is read as for an IPC02, with the commands sf, af, bf and ef.

single write fixed code:

Command: "sx" <DeviceNo> <FixType> <FixLen> <Data>
<CHCK> <ETX>
Response: <Status> <DeviceNo> <CHCK> <ETX>

One attempt is made to write a fixed code. <FixType> is always "02" here and <FixLen> is always "05", since 5 bytes must always be written.

auto write fixed code:

Command: "ax" <DeviceNo> <FixType> <FixLen> <Data>
<CHCK> <ETX>
Response: <Status> <DeviceNo> <CHCK> <ETX>

An attempt is made until successful, to write a fixed code.

buffered write fixed code:

Command: "bx" <DeviceNo> <FixType> <FixLen> <Data>
<CHCK> <ETX>
Response: <Status> <DeviceNo> <CHCK> <ETX>

One attempt is made to write a fixed code. After each successful write, the response is sent and the system waits until a new data carrier is within the detection range. Then the command sequence starts again.

enhanced buffered write fixed code:

Command: "ex" <DeviceNo> <FixType> <FixLen> <Data>
<CHCK> <ETX>
Response: <Status> <DeviceNo> <CHCK> <ETX>

This command behaves as the buffered-write-fixed code command, only the Status "5" is output when the data carrier leaves the read range.

7.7 Legend

<CHCK>: 1 ASCII character, 8 bit checksum in addition over all characters, without overrun.
<ETX>: 1 character ASCII 03
<DeviceNo>: Read head number 2 ASCII characters, range from "01" to "1E".
<Status>: 1 character ASCII

Status	Error
0	No error
2	Switch on message, device is ready for operation.
4	Wrong or incomplete command, or parameter not in the valid range.
5	Read error or write error.

<TagType>: 2 character ASCII
<Timeout>: Timeout of the Interface, an error message is sent after this time.
<SW-No>: Application software number.
<Date>: Date of the application software version.
<WordAddr>: Word start address in the data carrier, 4 ASCII characters, range from "0000" to "FFFF" depending on data carrier type.
<WordNum>: Number of words to be read or written, 2 character ASCII. Range from "00" to "FF" depending on the data carrier type. The following applies to the IPC03:
The word number "00" is used with the word-address "0000" for reading the data range preset on the data carrier.

- <ExecCounter>: If a read/write command has been activated before the get data command, then the number of successfully executed write or read attempts is logged in the execution counter. If the data of an earlier active command have already been acquired or if a system command has already been sent, then the execution counter has the value "-" (2Dh). It is reset to "0" with each get-data command. It counts the number of successfully executed read attempts. The highest value at which the counter remains is "9".
- <Data>: <WordNum> x 4 bytes
When a word is communicated, the highest value byte is transferred first and the lowest value byte last.
- <ConfAddr>: Word start address in the configuration range of the data carrier. 1 character ASCII range from "0" to "F" depending on data carrier type.
The following applies for IPC03:
"1" = Protection word
"2" = Control word
- <Mode>: 1 character ASCII "0" or "1".
- <Param>: 1 character ASCII
- <FixType>: 2 character ASCII "02" for IPC02
- <FixLen>: 2 character ASCII "05" for IPC02

8 Technical data

8.1 General data

Serial interface

Type	RS 485, addressable Bus connection with up to 30 lower section addresses 1 ... 30
Transfer rate in baud	1200, 2400, 4800, 9600, 19200, 38400
Permissible overall cable length	1200 m

Electrical data:

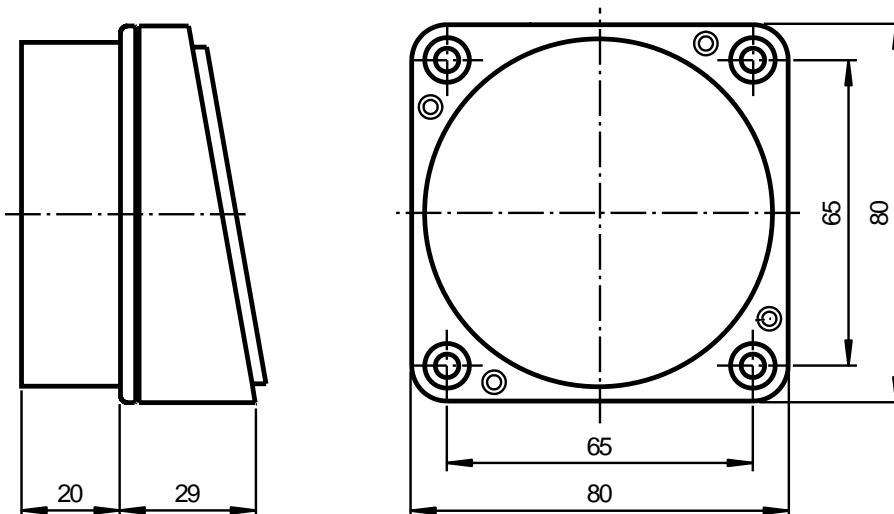
Operating voltage U_B	20 V DC ... 30 V DC, PELV
Ripple at $U_B = 24$ V	± 10 %, at $U_B = 30$ V < 300 mA with read/write station

8.2 Mechanical data and connections

Read/write station IPT-FP

Mechanical data

Housing material	PTB (Polybutylenterephthalate)
Ambient temperature	248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)
Storage temperature	233 Kelvin ... 358 Kelvin (-40 °C ... +85 °C)
Protection class in accordance with EN 60529	IP67 in association with lower sections
Voltage supply	via lower sections



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Distances		in air
Read distance with	IPC02-20W	0 mm ... 40 mm
Read distance with	IPC02-30W	0 mm ... 50 mm
Read distance with	IPC02-50W	0 mm ... 80 mm
Read distance with	IPC02-C1	0 mm ... 80 mm
Read distance with	IPC02-68-T5	0 mm ... 50 mm
Read distance with	IPC03-20W	0 mm ... 30 mm
Write distance with	IPC03-20W	0 mm ... 25 mm
Read distance with	IPC03-30W	0 mm ... 40 mm
Write distance with	IPC03-30W	0 mm ... 30 mm
Read distance with	IPC03-50W	0 mm ... 60 mm
Write distance with	IPC03-50W	0 mm ... 45 mm
Read distance with	IPC03-C1	0 mm ... 60 mm
Write distance with	IPC03-C1	0 mm ... 45 mm
Read distance with	IPC10-20	0 mm ... 30 mm
Write distance with	IPC10-20	0 mm ... 25 mm

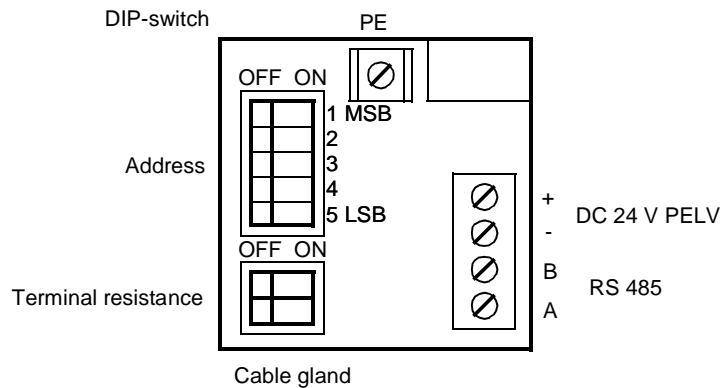
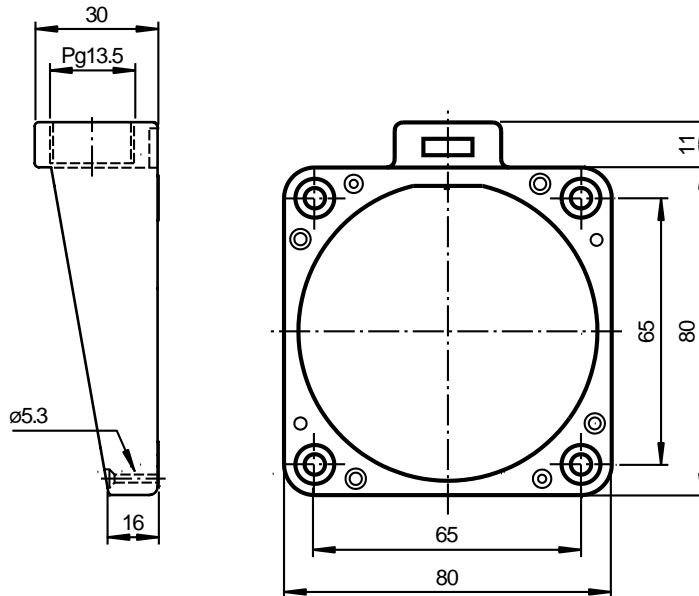
IDENT-I System P • IPT-FP with U-P□-R4

Technical data

Lower section U-P3-R4

Mechanical data

Housing material	Metal, powder coated
Ambient temperature	248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)
Storage temperature	233 Kelvin ... 358 Kelvin (-40 °C ... +85 °C)
Protection class in accordance with EN 60529	IP67 in conjunction with IPT-FP
Connection type	screw terminals
Interface cable	2-core, RS 485
Voltage supply	up to 3 x 1.5 mm ²

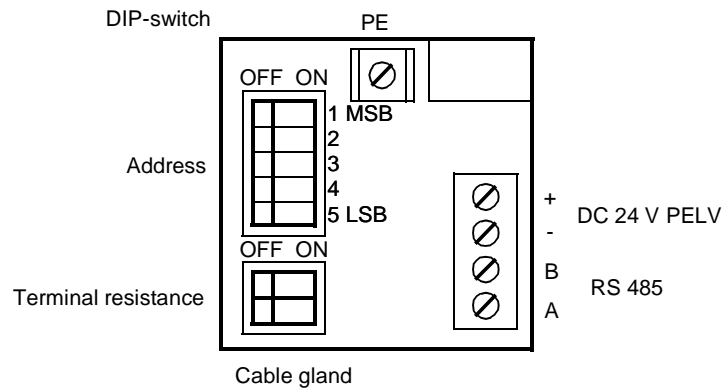
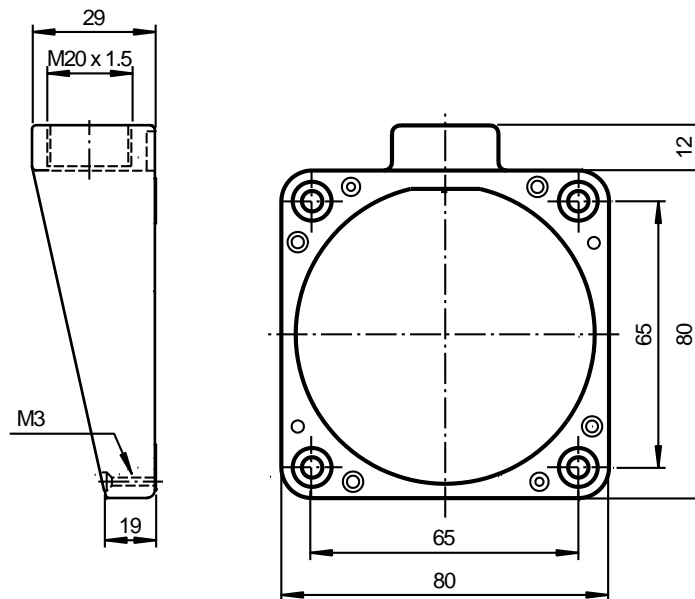


Date of issue 03.07.2000

Lower section U-P3V4A-R4

Mechanical data

Housing material	Metal V4A
Ambient temperature	248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)
Storage temperature	233 Kelvin ... 358 Kelvin (-40 °C ... +85 °C)
Protection class in accordance with EN 60529	IP67 in conjunction with IPT-FP
Connection type	screw terminals
Interface cable	2-core, RS 485
Voltage supply	up to 3 x 1.5 mm ²



IDENT-I System P • IPT-FP with U-P□-R4

Technical data

Lower section U-P6-R4

Mechanical data

Housing material	Aluminium, black anodised
Operating temperature	248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)
Storage temperature	233 Kelvin ... 358 Kelvin (-40 °C ... +85 °C)
Protection class in accordance with EN 60529	IP 67 in conjunction with IPT-FP
	PG9 cable glands that are not used must be sealed with the plugs provided.
	The plugs are suitable for both the standard cable glands and the EMC cable glands.

Connections:

PE:

via crimp connector > 4 mm²

Bus cable:

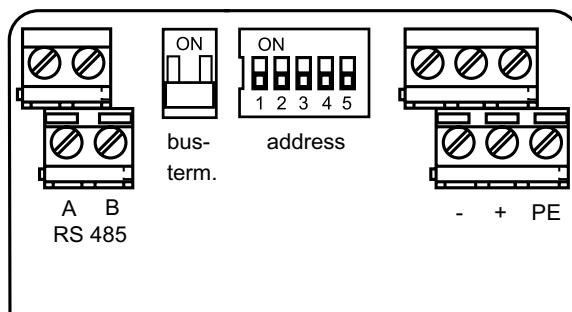
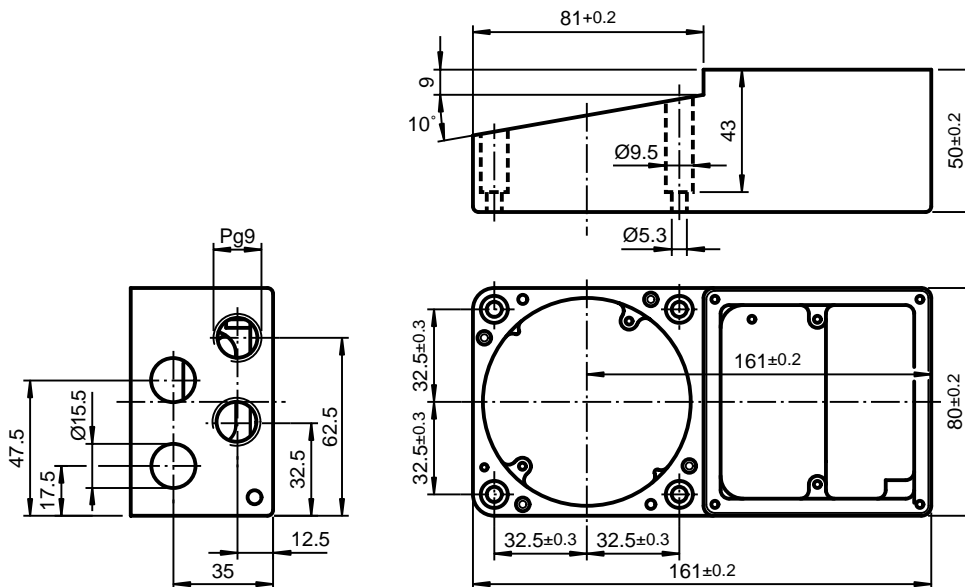
Screw terminals via 2 x PG9 EMC cable glands

up to 3 x 1.5 mm²

Voltage supply:

Screw terminals via 2 x PG9 standard cable glands

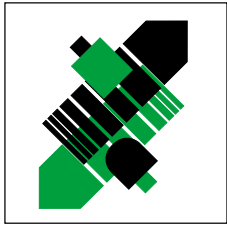
up to 3 x 1.5 mm²



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One Company, Two Divisions.



Factory Automation Division

Product Range

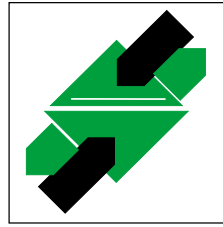
- Digital and analogue sensors
- in different technologies
 - Inductive and capacitive sensors
 - Magnetic sensors
 - Ultrasonic sensors
 - Photoelectric sensors
- Incremental and absolute rotary encoders
- Counters and control equipment
- Identification Systems
- AS-Interface

Areas of Application

- Machine engineering
- Conveyor or transport
- Packaging and bottling
- Automotive industry

Service Area

Worldwide sales, customer service and consultation via competent and reliable Pepperl+Fuchs associates ensure that you can contact us wherever or whenever you need us. We have subsidiaries worldwide for your convenience.



Process Automation Division

Product Range

- Signal conditioners
- Intrinsically safe interface modules
- Remote Process Interface (RPI)
- Intrinsically safe field bus solutions
- Level control sensors
- Process measuring and control systems engineering at the interface level
- Intrinsic safety training

Areas of Application

- Chemical industry
- Industrial and community sewage
- Oil, gas and petrochemical industry
- PLC and process control systems
- Engineering companies for process systems

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