

## Data mapping of system Puma Profinet

### General:

The data mapping of the mentioned input and output modules refer to the definitions in the GSDML file - 'GSDML-V2.42-Tele Radio GmbH-NIC52RE-Puma-20220110'.

The data of the input module include the states of the user controls (pushbuttons, joysticks, potentiometers, ...) of the associated transmitter(s), as well as general information on the system status (e. g. radio link quality, serial number of the active transmitter, etc.). It is possible to present a maximum of 64 digital (= switch) signals (DK0 – DK63) and up to 15 analogue signals (AK0 – AK 14, each 8 bit long, including sign).

In the GSDML file, there is a 32-byte wide input module defined which holds these data. The input module has a fixed data mapping and is permanently plugged into slot 5 and cannot be removed from there.

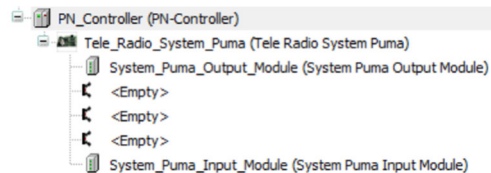
Unused bits and bytes always read as zero.

In the GSDML file, there is also a 32-byte wide output module defined. The PLC can write data to the output module which can, for example, be used as feedback signals to the transmitter (meter readings, texts, LEDs, buzzer, ...) or for switching outputs of the receiver, etc. The 32 data bytes do not have a fixed or predefined meaning and can be written each separately. The evaluation of these data must be done via receiver settings, depending on the use case.

The output module has a fixed data structure and is permanently plugged into slot 1 and cannot be removed from there.

Unused bits and bytes in the output module can be written with any value. However, this has no effect unless these data are evaluated via receiver settings.

Input and output module shown in Codesys:



**Data mapping of system Puma Profinet**

**Contents**

<b>Input module .....</b>	<b>3</b>
<b>Output module .....</b>	<b>5</b>

## Data mapping of system Puma Profinet

### Input module

#### Data mapping:

Byte no.	Name	Data type	Bit mapping	Explanation
0	Used radio channel	uint8	value range 11 – 26 <sub>dec</sub>	Radio channel (in the 2.4 GHz ISM frequency band) on which the radio communication takes place.
1	Radio link quality indicator	uint8	value range 0 – 255 <sub>dec</sub>	The higher this value, the better the quality of the radio link.
2 – 3	Radio status flags	uint16	bit0: Radio data received within timeout limits  bit1: Raw radio link and session  bit2: Active radio session  bit3: Active radio link (short timeout)  bit4: Active radio link (radio link timeout)  bit5: Start phase active  bit6: Kill phase active  bit7: Stop button pressed (active emergency stop)  bit8: Radio link lost (passive emergency stop)  bit9: Radio link ok  bit10: TX battery low  bit11: Stop relay status  bits12 – 15: currently unused	1, if radio data have been received within the specified timeout limits, 0, if radio data were not received within timeout limits (can lead to passive emergency stop).  1, if there is raw data communication between transmitter and receiver and a session (radio signals from a registered transmitter have been received within the session timeout limit) is active, 0, no radio link and/or session.  1, if radio signals of a registered transmitter have been received within the session timeout (active radio link does not necessarily exist), 0, if no radio signals have been received within the session timeout.  1, if radio link exists and at least one control element has been activated within the specified short timeout, 0, if radio link exists, but no control element on the transmitter has been operated within the short timeout.  1, after a radio packet without activated TX control elements has been received for the first time, 0, as long as no data packet without activated control elements has been received.  1, as long as a programmed start phase is active after the transmitter has been started and a session has been initiated, 0, if no start phase is active.  1, as long as a programmed kill phase is active after the stop button on the transmitter has been pressed, 0, if no kill phase is active.  1, if an active emergency stop has been initiated by pressing the stop button on the transmitter, the bit remains high until a new session is initiated by the transmitter, 0, as long as no active emergency stop is initiated.  1, if radio link is lost for at least 500 ms during an active session. Remains high until either the radio link is re-established or a session timeout occurs, 0, as long as the radio link is stable during an active session.  1, as long as radio data are periodically received within less than 500 ms, 0, if no radio data could be received within 500 ms (leads to passive emergency stop).  1, if the battery capacity on the transmitter falls below the minimum value, 0, if the battery has sufficient charge.  1, if the stop relays in the receiver are on, 0, if the stop relays in the receiver are off (emergency stop situation)-
4 – 7	ID of active transmitter	uint32	value range 1 – FFFFFFFF <sub>hex</sub>	ID of the transmitter which is currently in session with the receiver, 0, if no session exists.
8 - 15	Digital signals	uint64	value range 0 - FFFFFFFF <sub>hex</sub>	DK0 – DK63, states of the digital switching inputs (pushbuttons, toggle switches, ...) on the transmitter, one bit per switch signal. Unused inputs read as zero. The mapping of the digital input to a certain control element on the transmitter is documented separately.
16	Analogue channel AK0	int8	value range -127 <sub>dec</sub> - +127 <sub>dec</sub>	Analogue value of the corresponding control on the transmitter (joystick, potentiometer, etc.). Unused analogue inputs read as zero. The mapping of the analogue input to a certain control element on the transmitter is documented separately.
17	Analogue channel AK1	int8	value range -127 <sub>dec</sub> - +127 <sub>dec</sub>	Analogue value of the corresponding control on the transmitter (joystick, potentiometer, etc.). Unused analogue inputs read as zero. The mapping of the analogue input to a certain control element on the transmitter is documented separately.

## Data mapping of system Puma Profinet

Byte no.	Name	Data type	Bit mapping	Explanation
18	Analogue channel AK2	int8	value range -127 <sub>dec</sub> - +127 <sub>dec</sub>	Analogue value of the corresponding control on the transmitter (joystick, potentiometer, etc.). Unused analogue inputs read as zero. The mapping of the analogue input to a certain control element on the transmitter is documented separately.
19	Analogue channel AK3	int8	value range -127 <sub>dec</sub> - +127 <sub>dec</sub>	Analogue value of the corresponding control on the transmitter (joystick, potentiometer, etc.). Unused analogue inputs read as zero. The mapping of the analogue input to a certain control element on the transmitter is documented separately.
20	Analogue channel AK4	int8	value range -127 <sub>dec</sub> - +127 <sub>dec</sub>	Analogue value of the corresponding control on the transmitter (joystick, potentiometer, etc.). Unused analogue inputs read as zero. The mapping of the analogue input to a certain control element on the transmitter is documented separately.
21	Analogue channel AK5	int8	value range -127 <sub>dec</sub> - +127 <sub>dec</sub>	Analogue value of the corresponding control on the transmitter (joystick, potentiometer, etc.). Unused analogue inputs read as zero. The mapping of the analogue input to a certain control element on the transmitter is documented separately.
22	Analogue channel AK6	int8	value range -127 <sub>dec</sub> - +127 <sub>dec</sub>	Analogue value of the corresponding control on the transmitter (joystick, potentiometer, etc.). Unused analogue inputs read as zero. The mapping of the analogue input to a certain control element on the transmitter is documented separately.
23	Analogue channel AK7	int8	value range -127 <sub>dec</sub> - +127 <sub>dec</sub>	Analogue value of the corresponding control on the transmitter (joystick, potentiometer, etc.). Unused analogue inputs read as zero. The mapping of the analogue input to a certain control element on the transmitter is documented separately.
24	Analogue channel AK8	int8	value range -127 <sub>dec</sub> - +127 <sub>dec</sub>	Analogue value of the corresponding control on the transmitter (joystick, potentiometer, etc.). Unused analogue inputs read as zero. The mapping of the analogue input to a certain control element on the transmitter is documented separately.
25	Analogue channel AK9	int8	value range -127 <sub>dec</sub> - +127 <sub>dec</sub>	Analogue value of the corresponding control on the transmitter (joystick, potentiometer, etc.). Unused analogue inputs read as zero. The mapping of the analogue input to a certain control element on the transmitter is documented separately.
26	Analogue channel AK10	int8	value range -127 <sub>dec</sub> - +127 <sub>dec</sub>	Analogue value of the corresponding control on the transmitter (joystick, potentiometer, etc.). Unused analogue inputs read as zero. The mapping of the analogue input to a certain control element on the transmitter is documented separately.
27	Analogue channel AK11	int8	value range -127 <sub>dec</sub> - +127 <sub>dec</sub>	Analogue value of the corresponding control on the transmitter (joystick, potentiometer, etc.). Unused analogue inputs read as zero. The mapping of the analogue input to a certain control element on the transmitter is documented separately.
28	Analogue channel AK12	int8	value range -127 <sub>dec</sub> - +127 <sub>dec</sub>	Analogue value of the corresponding control on the transmitter (joystick, potentiometer, etc.). Unused analogue inputs read as zero. The mapping of the analogue input to a certain control element on the transmitter is documented separately.
29	Analogue channel AK13	int8	value range -127 <sub>dec</sub> - +127 <sub>dec</sub>	Analogue value of the corresponding control on the transmitter (joystick, potentiometer, etc.). Unused analogue inputs read as zero. The mapping of the analogue input to a certain control element on the transmitter is documented separately.
30	Analogue channel AK14	int8	value range -127 <sub>dec</sub> - +127 <sub>dec</sub>	Analogue value of the corresponding control on the transmitter (joystick, potentiometer, etc.). Unused analogue inputs read as zero. The mapping of the analogue input to a certain control element on the transmitter is documented separately.
31	Ring counter for received radio packets	uint8	value range 0 - 255 <sub>dec</sub>	The ring counter is incremented app. twice per second to indicate that radio communication takes place. On counter overrun (counter value = 256) the counter is reset to 0 and continues counting from there.

## Data mapping of system Puma Profinet

### Output module

#### Data mapping:

Byte no.	Name	Data type	Bit mapping	Explanation
0	Fieldbus output byte 0	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
1	Fieldbus output byte 1	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
2	Fieldbus output byte 2	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
3	Fieldbus output byte 3	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
4	Fieldbus output byte 4	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
5	Fieldbus output byte 5	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
6	Fieldbus output byte 6	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
7	Fieldbus output byte 7	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
8	Fieldbus output byte 8	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
9	Fieldbus output byte 9	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
10	Fieldbus output byte 10	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
11	Fieldbus output byte 11	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
12	Fieldbus output byte 12	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
13	Fieldbus output byte 13	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
14	Fieldbus output byte 14	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
15	Fieldbus output byte 15	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
16	Fieldbus output byte 16	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
17	Fieldbus output byte 17	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
18	Fieldbus output byte 18	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.

## Data mapping of system Puma Profinet

Byte no.	Name	Data type	Bit mapping	Explanation
19	Fieldbus output byte 19	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
20	Fieldbus output byte 20	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
21	Fieldbus output byte 21	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
22	Fieldbus output byte 22	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
23	Fieldbus output byte 23	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
24	Fieldbus output byte 24	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
25	Fieldbus output byte 25	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
26	Fieldbus output byte 26	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
27	Fieldbus output byte 27	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
28	Fieldbus output byte 28	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
29	Fieldbus output byte 29	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
30	Fieldbus output byte 30	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.
31	Fieldbus output byte 31	uint8	value range value range 0 - 255 <sub>dec</sub>	Data byte which it sent from PLC to the receiver, can contain metered values, text characters, etc. If this byte is used, its function is documented separately.