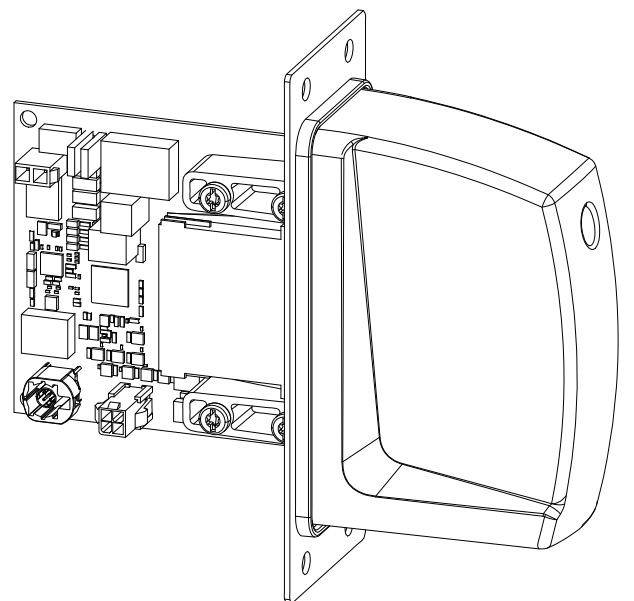


Operating Instructions

RI FB/i IGM V1.0
RI MOD/i CC EtherCAT
RI MOD/i CC DeviceNet



EN-US | Operating instructions



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Safety

⚠ WARNING!

Danger from incorrect operation and work that is not carried out properly.

This can result in serious personal injury and damage to property.

- ▶ All the work and functions described in this document must only be carried out by technically trained and qualified personnel.
- ▶ Read and understand this document in full.
- ▶ Read and understand all safety rules and user documentation for this equipment and all system components.

⚠ WARNING!

Danger from electrical current.

This can result in serious personal injury and damage to property.

- ▶ Before starting work, switch off all the devices and components involved and disconnect them from the grid.
- ▶ Secure all devices and components involved so they cannot be switched back on.

⚠ WARNING!

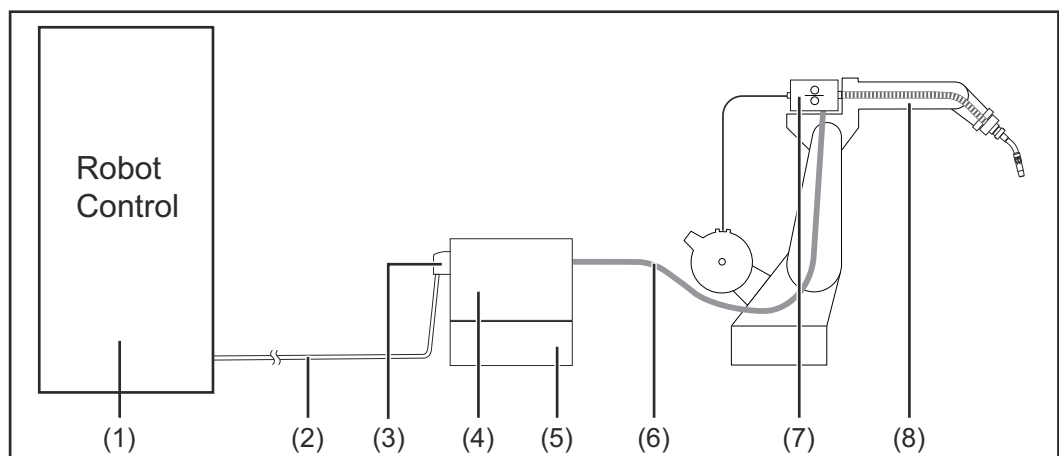
Danger from unplanned signal transmission.

This can result in serious personal injury and damage to property.

- ▶ Do not transfer safety signals via the interface.

Device Concept

The robot interface serves as an interface between the power source and standardized bus modules supporting a wide range of communication protocols. Fronius may factory-fit the robot interface in the power source but it can also be retrofitted by appropriately trained and qualified personnel.



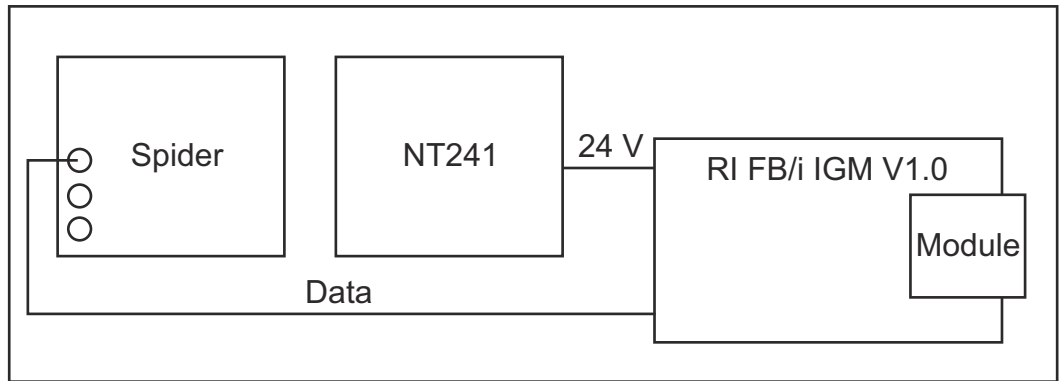
(1) Robot control system

(2) SpeedNet data cable

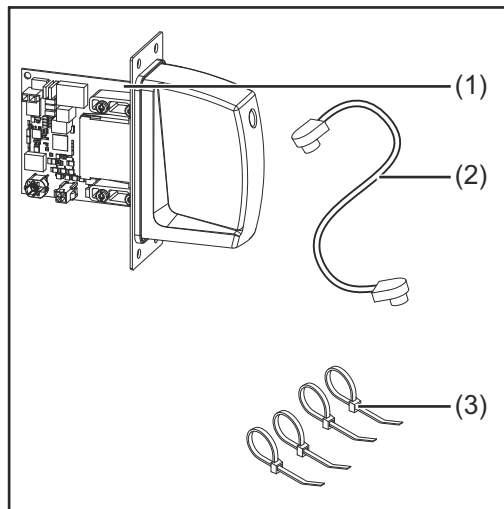
(3) Robot interface

-
- (4) **Power source**
 - (5) **Cooling unit**
 - (6) **Interconnecting hosepack**
 - (7) **Wirefeeder**
 - (8) **Robot**
-

Block Diagram



Scope of Supply



-
- (1) **RI FB/i IGM V1.0**
 - (2) **Data cable
4-pin**
 - (3) **Cable ties**
 - (4) **These Operating Instructions
(not pictured)**
-

Required Tools and Materials

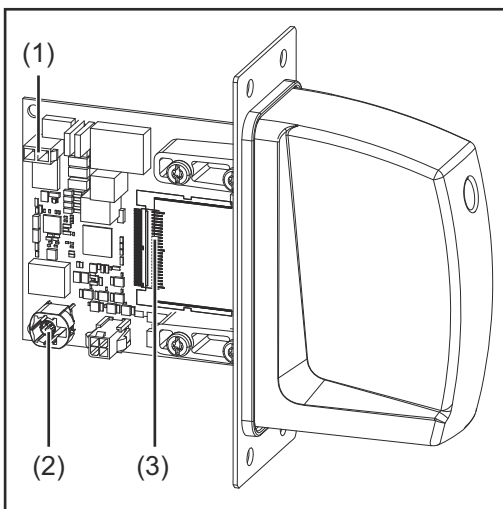
- Screwdriver TX8
- Screwdriver TX20
- Screwdriver TX25
- Diagonal cutting pliers

Installation Requirements

The robot interface may only be installed in the designated opening on the rear of the power source.

Connection Sockets and Indicators on the Robot Interface

Connections on the Robot Interface

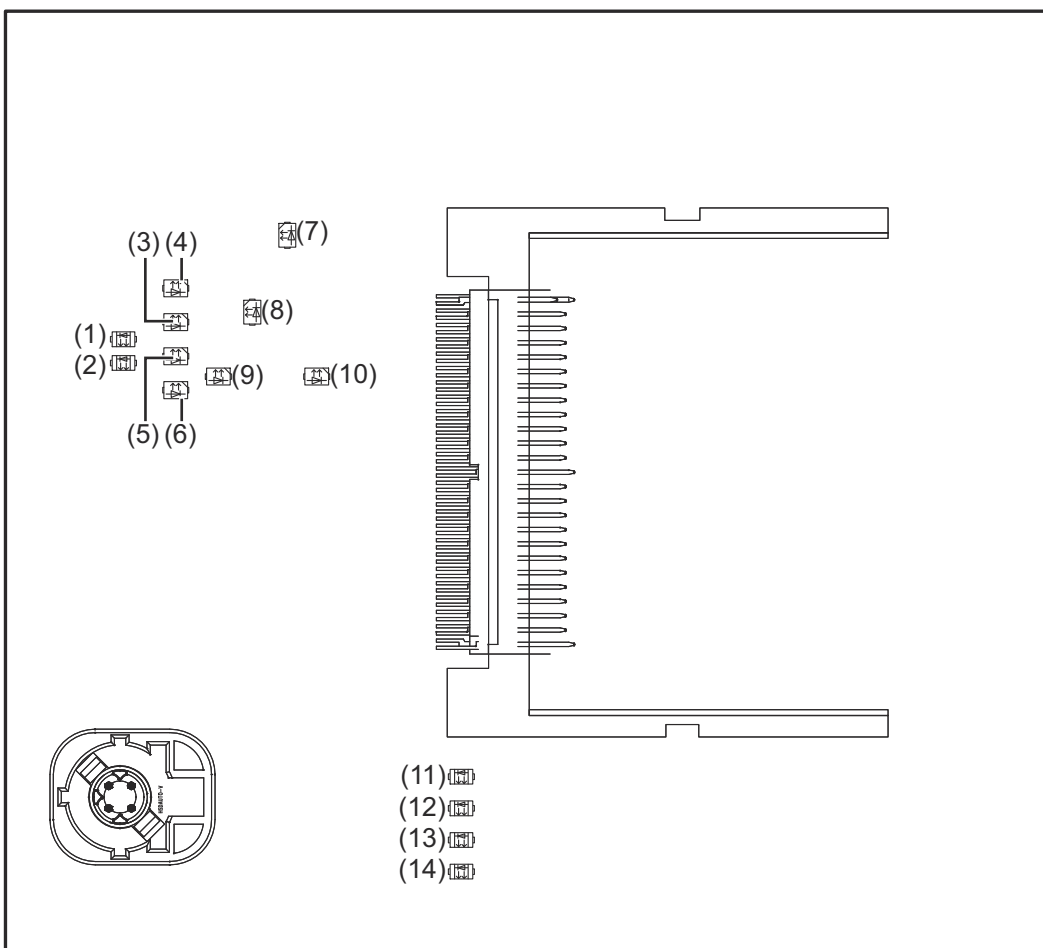


- (1) Power supply connection
2-pin

- (2) SpeedNet data cable connection
4-pin

- (3) Bus module connection

LEDs on Robot Interface PCB



(1)	ETH1 LED	Green	For diagnosing the network connection. For details, see section below titled "LEDs for Network Connection Diagnosis"
(2)	ETH2 LED	Orange	
(3)	LED 3	Green	No function
(4)	LED 4	Green	
(5)	LED 5	Green	<ul style="list-style-type: none"> - Flashes at 4 Hz = No SpeedNet connection - Flashes at 20 Hz = Establishing SpeedNet connection - Flashes at 1 Hz = SpeedNet connection established
(6)	LED 6	Red	Lights up when an internal error occurs. Remedy: Restart the robot interface. If this does not resolve the issue, inform the service team.
(7)	+3V3 LED	Green	For diagnosing the power supply. For details, see section below titled "LEDs for Power Supply Diagnosis"
(8)	+24V LED	Green	
(9)	DIG OUT 2 LED	Green	Digital output 2. LED lights up when active
(10)	DIG OUT 1 LED	Green	Digital output 1. LED lights up when active
(11)	LED 11	Green	No function
(12)	LED 12	Green	
(13)	LED 13	Green	
(14)	LED 14	Green	

LEDs for Power Supply Diagnosis

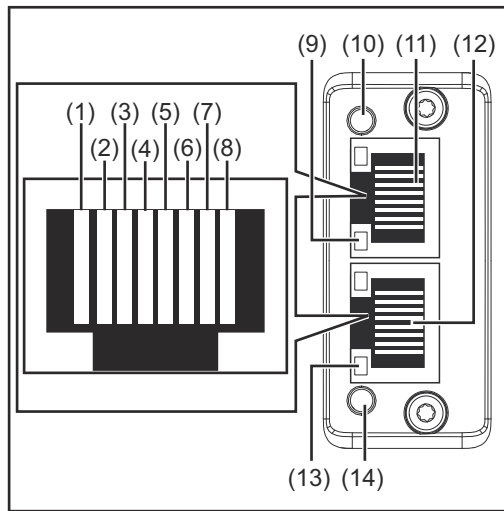
LED	Indicator	Meaning	Cause
+24V	Off	No supply voltage available for interface	<ul style="list-style-type: none"> - Robot interface power supply not established - Power supply cable faulty
	Lights up	24 VDC supply voltage present on robot interface	
+3V3	Off	No operating voltage present on robot interface	<ul style="list-style-type: none"> - 24 VDC supply voltage not present - Robot interface power supply unit is faulty
	Lights up	3 VDC operating voltage present on robot interface	

LEDs for Network Connection Diagnosis

LED	Indicator	Meaning	Cause
ETH1	Off	No network connection	<ul style="list-style-type: none">- No network connection established for interface- Network cable faulty
	Lights up	Network connection established	
	Flashes	Data transfer in progress	
ETH2	Off	Transmission speed 10 Mbit/s	
	Lights up	Transmission speed 100 Mbit/s	

Connections and Indicators on the Bus Module - EtherCAT

Connections and Indicators



(1)	TX+
(2)	TX-
(3)	RX+
(6)	RX-
(4), (5)	Not normally used; to ensure signal completeness, these pins must be interconnected and, after passing through a filter circuit, must terminate at the ground conductor (PE).
(7), (8)	Not normally used; to ensure signal completeness, these pins must be interconnected and, after passing through a filter circuit, must terminate at the ground conductor (PE).

(9)	Connection/Activity LED - EtherCAToutput
(10)	ERR LED (error)
(11)	EtherCAToutput
(12)	EtherCATinput
(13)	Connection/Activity LED - EtherCATinput
(14)	RUN LED (operation)

RUN LED (operation)

This indicates the status of the CoE communication.
(CoE = CANopen over EtherCAT)

Status	Meaning
Off	EtherCAT device in 'init' status (or no supply voltage)
Lights up green	EtherCAT device in 'operational' status
Flashes green	EtherCAT device in 'pre-operational' status
Flashes green (briefly)	EtherCAT device in 'safe-operational' status
Lights up red	If the Run LED and Error LED light up red, this indicates a serious event which places the interface in an exception state. ➡ Contact the service team

ERR LED (error)

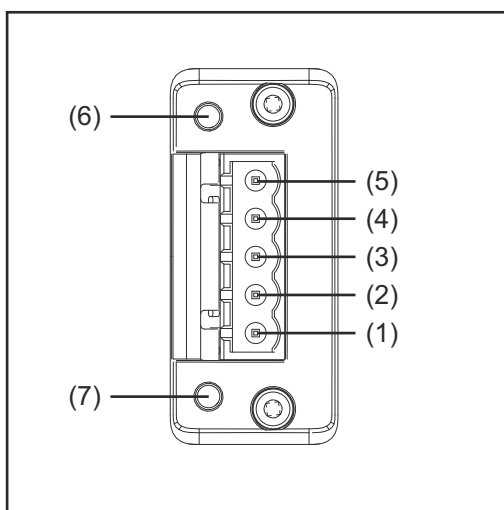
Status	Meaning
Off	No error (or no supply voltage)

ERR LED (error)	
Status	Meaning
Flashes red	Incorrect configuration The status change received from the master is not possible due to invalid register or object settings.
Flashes red (twice)	Application watchdog timeout Sync manager watchdog timeout
Lights up red	Application controller failure Anybus module in EXCEPTION

Connection/Activity LED	
Status	Meaning
Off	No connection (or no supply voltage)
Lights up green	Connection detected, no activity
Flickers green	Connection detected, activity present

Connections and Indicators on the Bus Module - DeviceNet

Connections and Indicators



Pin	Signal	Description
(1)	V -	Supply voltage
(2)	CAN_ L	CAN low bus line
(3)	SHIEL D	Cable shield
(4)	CAN_ H	CAN high bus line
(5)	V +	Supply voltage

Indicators

(6)	LED MS (Module Status)
(7)	LED NS (Network Status)

LED MS (Module Status)

Status	Meaning
Off	No supply voltage
Lights up green	Normal operation
Flashes green	Missing or incomplete configuration, commissioning required
Lights up red	Non-correctable error
Flashes red	Correctable error
Alternates between red and green	Self-test is running

LED NS (Network Status)

Status	Meaning
Off	Not online or no supply voltage
Lights up green	Online, one or more connections established
Flashes green	Online, no connections established
Lights up red	Critical connection error
Flashes red	Timeout for one or more of the connections
Alternates between red and green	Self-test is running

Technical Data EtherCAT

Environmental Conditions

⚠ CAUTION!

A risk is posed by prohibited environmental conditions.

This can result in severe damage to equipment.

- ▶ Only store and operate the device under the following environmental conditions.

Temperature range of ambient air:

- During operation: -10 °C to +40 °C (14 °F to 104 °F)
- During transport and storage: -20 °C to +55 °C (-4 °F to 131 °F)

Relative humidity:

- Up to 50% at 40 °C (104 °F)
- Up to 90% at 20 °C (68 °F)

Ambient air: free of dust, acids, corrosive gases or substances, etc.

Altitude above sea level: up to 2000 m (6500 ft).

Robot Interface Technical Data

Power supply	Internal (24 V)
Degree of protection	IP 23

Data Transfer Properties

Transfer technology:
EtherCAT

Medium:

When selecting the cable, plug, and terminating resistors, the IEC 61784-5-12 for the planning and installation of EtherCAT systems must be observed.

The EMC tests were carried out by the manufacturer with an original Beckhoff cable (ZK1090-9191-xxxx).

Transmission speed:

100 Mbit/s

Bus connection:

RJ45 Ethernet

Application layer:

CANopen

Configuration Parameters

In some robot control systems, it may be necessary to state the configuration parameters described here so that the bus module can communicate with the robot.

Parameters	Value	Description
Vendor ID	0000 02C1 _{hex} (705 _{dec})	Fronius International GmbH
Product Code	0001 0341 _{hex} (66369 _{dec})	Standard image
Device name	Fronius FB-IGM-1-0- EtherCAT	Fronius-FB-Inside-EtherCAT

Technical Data DeviceNet

Environmental Conditions

⚠ CAUTION!

A risk is posed by prohibited environmental conditions.

This can result in severe damage to equipment.

- ▶ Only store and operate the device under the following environmental conditions.

Temperature range of ambient air:

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Ambient air: free of dust, acids, corrosive gases or substances, etc.

Altitude above sea level: up to 2000 m (6500 ft).

Robot Interface Technical Data

Power supply	Internal (24 V)
Degree of protection	IP 23

Data Transfer Properties

Network topology

Linear bus, bus termination on both ends (121 Ohm), stub cables are possible

Medium and maximum bus length

When selecting the cable, plug, and terminating resistors, the ODVA recommendation for the planning and installation of DeviceNet systems must be observed

Number of stations

Max. 64 participants

Transmission speed

500 kbit/s, 250 kbit/s, 125 kbit/s

Process data width

Can be configured in the robot interface
see following section "Configuration of robot interface"

Configuration Parameters

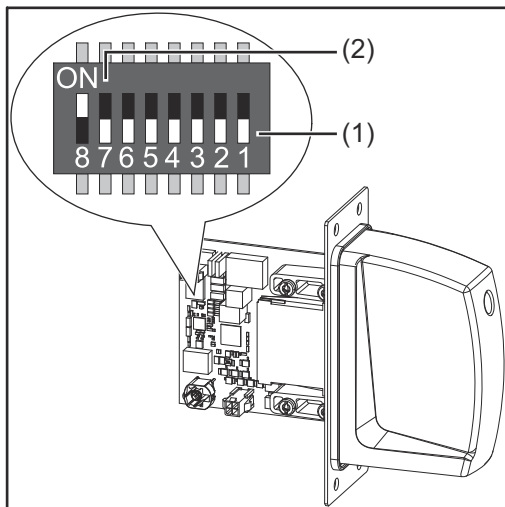
In some robot control systems, it may be necessary to state the configuration parameters described here so that the bus module can communicate with the robot.

Parameters	Value	Description
Vendor ID	0534 _{hex} (1332 _{dec})	Fronius International GmbH

Parameters	Value	Description
Device Type	000C _{hex} (12 _{dec})	Communication adapter
Product Code	0440 _{hex} (1088 _{dec})	Fronius FB IGM 1.0 DeviceNet
Product Name	Fronius FB-IGM-1-0-DeviceNet	

Configuring the Robot Interface - EtherCAT

Function of the Dip Switch on the Interface



The dip switch on the robot interface is used to set the process image (standard image).

Default setting for process image: Positions 7 and 8 of DIP switch set to OFF (1) = standard image = IGM V1.0

NOTE!

Risk due to non-effective DIP switch setting.

This may result in malfunctions.

- ▶ Every time you change the DIP switch settings, re-start the interface afterwards. This is essential for the changes to take effect.
- ▶ Interface re-start = disconnect and reconnect the power supply or execute the corresponding function on the power source website (SmartManager).

Setting the Process Data Width

Dip switch								Configuration
8	7	6	5	4	3	2	1	
OFF	OFF	-	-	-	-	-	-	IGM image 832 Bit
OFF	ON	-	-	-	-	-	-	Fronius standard image 320 Bit
ON	OFF	-	-	-	-	-	-	Not used
ON	ON	-	-	-	-	-	-	Not used

The process data width defines the scope of the transferred data volume.

The kind of data volume that can be transferred depends on

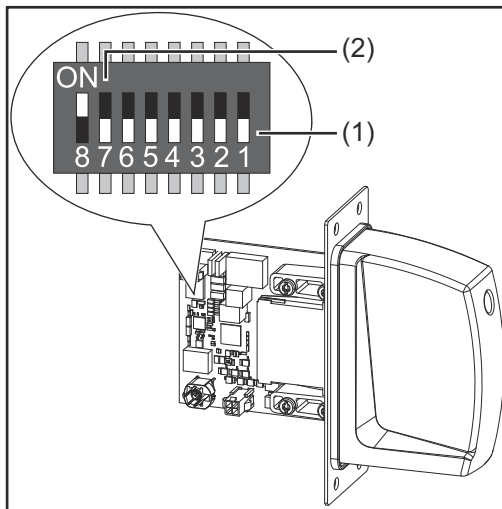
- the robot controls
- the number of power sources
- the type of power sources
 - "Intelligent Revolution"
 - "Digital Revolution" (Retro Fit)

Assigning the EtherCAT Address

The EtherCAT address is assigned by the master.

Configuring the Robot Interface - DeviceNet

Function of the Dip Switch on the Interface



The dip switch on the robot interface is used to configure:

- the process data width
- the node address

NOTE!

Risk due to non-effective DIP switch setting.

This may result in malfunctions.

- ▶ Every time you change the DIP switch settings, re-start the interface afterwards. This is essential for the changes to take effect.
- ▶ Interface re-start = disconnect and reconnect the power supply or execute the corresponding function on the power source website (SmartManager).

Setting the Process Data Width

Dip switch								Configuration
8	7	6	5	4	3	2	1	
OFF	OFF	-	-	-	-	-	-	Not used
OFF	ON	-	-	-	-	-	-	Fronius standard image 320 Bit
ON	OFF	-	-	-	-	-	-	Not used
ON	ON	-	-	-	-	-	-	Fronius Retro Fit image 96 Bit

The process data width defines the scope of the transferred data volume.

The kind of data volume that can be transferred depends on

- the robot controls
- the number of power sources
- the type of power sources
 - "Intelligent Revolution"
 - "Digital Revolution" (Retro Fit)

Set node address with dip switch (example)

Dip switch								Node address
8	7	6	5	4	3	2	1	
-	-	OFF	OFF	OFF	OFF	OFF	ON	1
-	-	OFF	OFF	OFF	OFF	ON	OFF	2
-	-	OFF	OFF	OFF	OFF	ON	ON	3
-	-	ON	ON	ON	ON	ON	OFF	62
-	-	ON	ON	ON	ON	ON	ON	63

The node address is set with positions 1 to 6 of the dip switch. The configuration is carried out in binary format. This results in a configuration range of 1 to 63 in decimal format.

Configuring the Node Address

Upon delivery the configured node address is 0.

The node address can be configured in two ways:

- Node addresses in the range of 1 to 63 can be configured with the dip switch. In this case, a node address previously configured by a configuration tool is overwritten.
- For more information about the dip switch see [Function of the Dip Switch on the Interface](#) on page 18.

If configurations have already been made, the network configurations can be restored to factory settings in two ways:

- set all dip switches back to 0 and restart interface
or
- with the button **Restore factory settings** on the website of the power source (SmartManager)

The Website of the Power Source

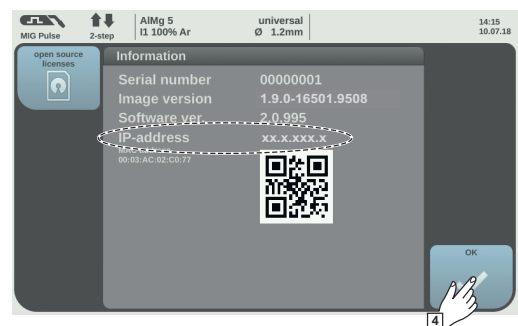
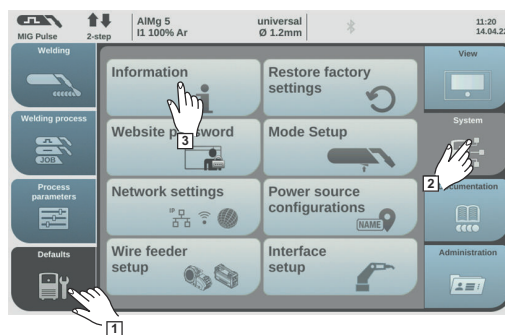
The power source has its own website, the SmartManager.

As soon as the power source has been integrated into a network, the SmartManager can be opened via the IP address of the power source.

Depending on the system configuration and software upgrades, the SmartManager may contain the following entries:

- Overview
- Update
- Screenshot
- Save and restore
- Function packages
- Job data
- Overview of characteristics
- **RI FB INSIDE/i**

Opening and Logging into the SmartManager for the Power Source



- 1 Presettings/System/Information ==> note down IP address of power source
- 2 Enter the IP address into the search field of the browser
- 3 Enter username and password

Factory setting:
Username = admin
Password = admin

- 4 Confirm displayed message

The SmartManager of the power source is displayed.

Installing the Robot Interface

Safety

⚠ WARNING!

Electrical current hazard.

This can result in serious injuries or death.

- ▶ Before starting work, switch off all the devices and components involved and disconnect them from the grid.
- ▶ Secure all the devices and components involved to prevent unintentional re-starting.
- ▶ After opening the device, use a suitable measuring instrument to check that electrically charged components (such as capacitors) have been discharged.

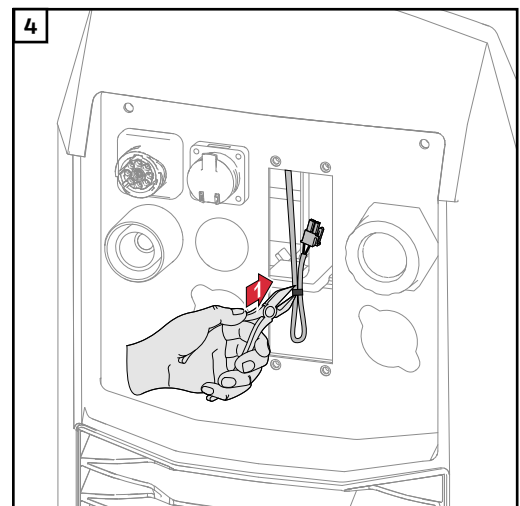
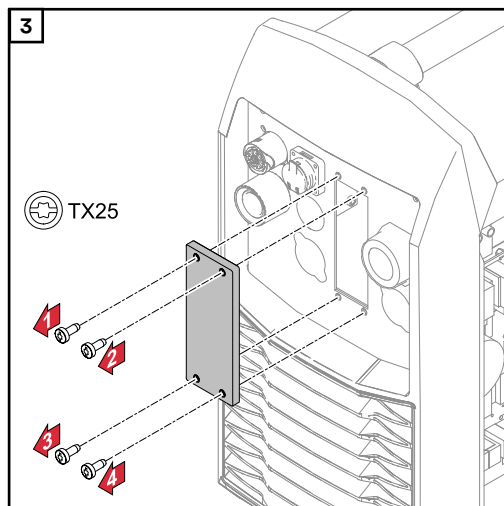
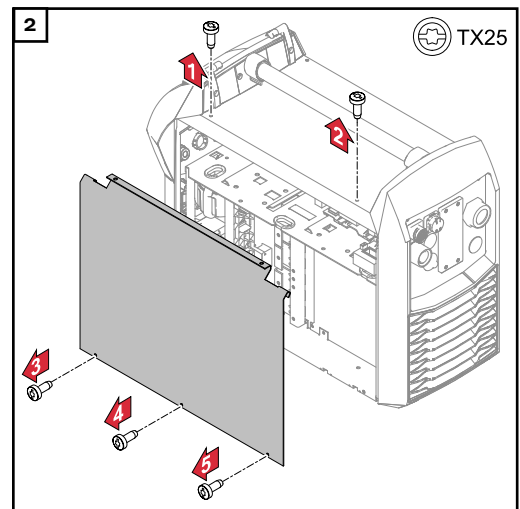
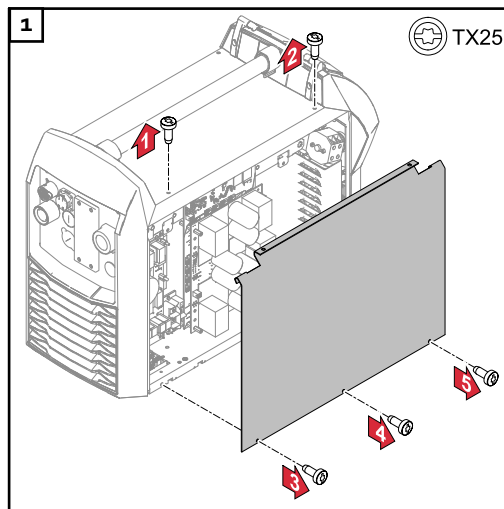
⚠ WARNING!

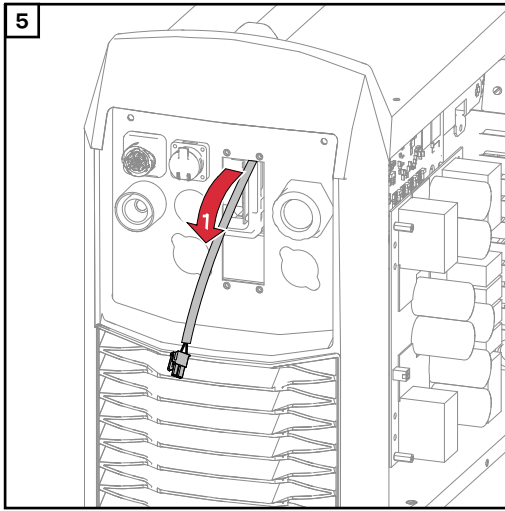
Electrical current hazard caused by an inadequate ground conductor connection.

This can result in severe personal injury and damage to property.

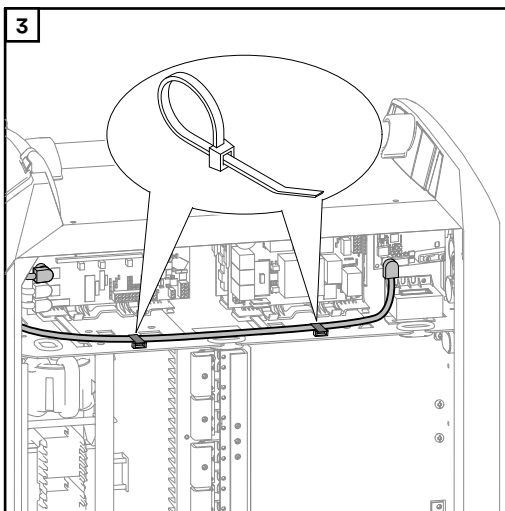
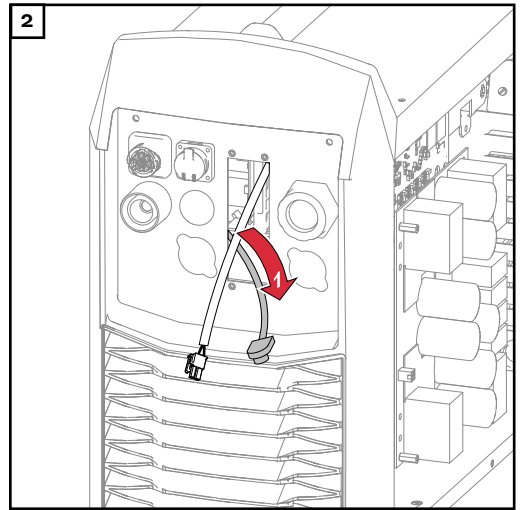
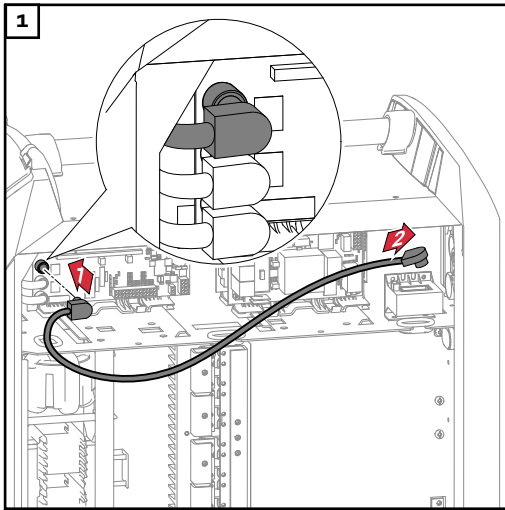
- ▶ Always use the original housing screws in the original quantity.

Preparation

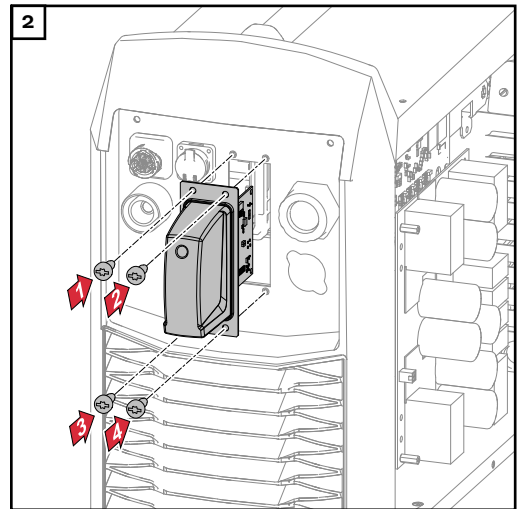
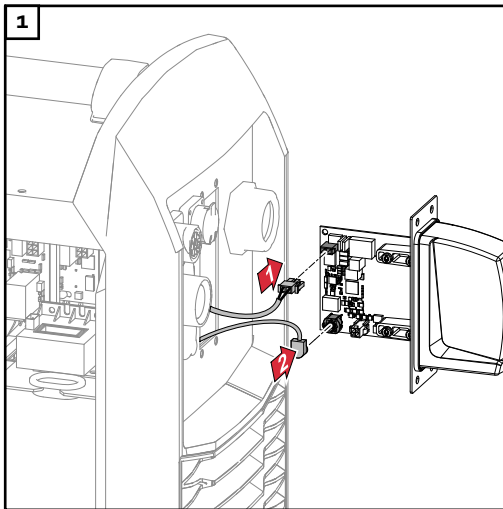




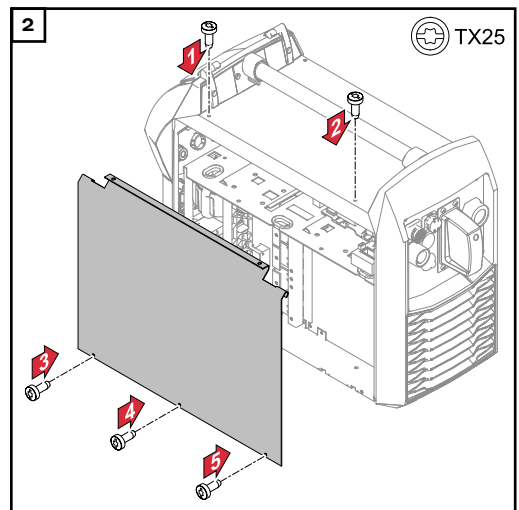
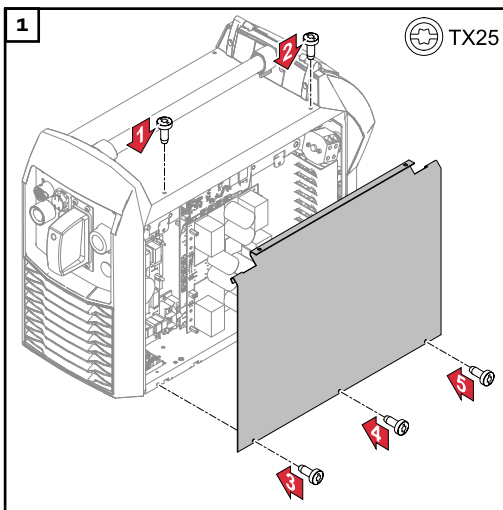
Routing the Data Cable



Installing the Robot Interface



Final Tasks



Installing the Bus Module

Safety

WARNING!

Danger from electrical current.

Serious injuries or death may result.

- ▶ Before starting work, switch off all devices and components involved, and disconnect them from the grid.
- ▶ Secure all devices and components involved so that they cannot be switched back on.

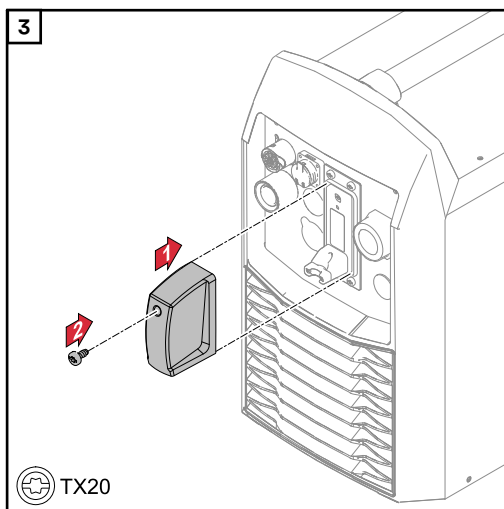
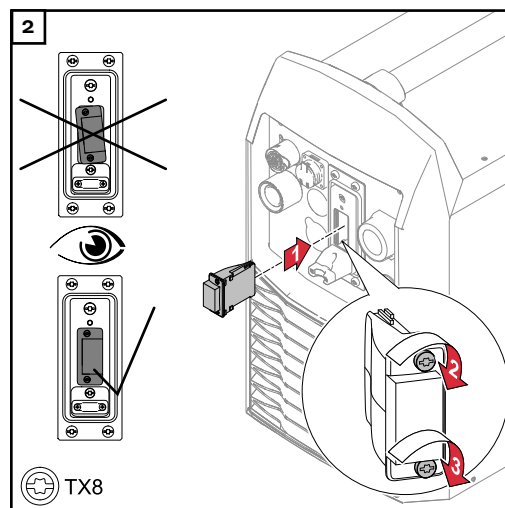
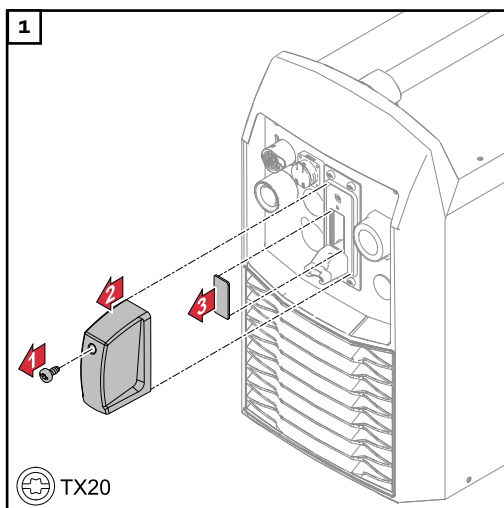
WARNING!

Danger from electrical current due to inadequate ground conductor connection.

Serious personal injury and property damage may result.

- ▶ Always use the original housing screws in the quantity initially supplied.

Installing the Bus Module



Input and Output Signals Standard Image IGM V1.0 - EtherCat

Data types

The following data types are used:

- **UINT16** (Unsigned Integer)
Whole number in the range from 0 to 65535
- **SINT16** (Signed Integer)
Whole number in the range from -32768 to 32767

Conversion examples:

- for a positive value (SINT16)
e.g. desired wire speed x factor
 $12.3 \text{ m/min} \times 100 = 1230_{\text{dec}} = 04CE_{\text{hex}}$
 - for a negative value (SINT16)
e.g. arc correction x factor
 $-6.4 \times 10 = -64_{\text{dec}} = FFC0_{\text{hex}}$
-

Availability of input signals

The input signals listed below are available from firmware V3.2.30 of the TPS/i power source.

Input signals (from robot to power source)

Address				Signal	Activity / data type	Range	Factor
Relative		Absolute					
WORD	BYTE	BIT	BIT				
0	0	0	0	Welding Start	Increasing		
		1	1	Robot ready	High		
		2	2	Working mode Bit 0	High	See table Value range for Working mode on page 33	
		3	3	Working mode Bit 1	High		
		4	4	Working mode Bit 2	High		
		5	5	Working mode Bit 3	High		
		6	6	Working mode Bit 4	High		
	7	7	—				
	1	0	8	Gas on	Increasing		
		1	9	Wire forward	Increasing		
		2	10	Wire backward	Increasing		
		3	11	Error quit	Increasing		
		4	12	Touch sensing	High		
		5	13	Torch blow out	Increasing		
		6	14	Process line selection Bit 0	High		
7		15	Process line selection Bit 1	High			

Address				Signal	Activity / data type	Range	Factor
Relative		Absolute					
WORD	BYTE	BIT	BIT				
1	2	0	16	Welding Simulation	High		
		1	17	Synchro pulse on	High		
		2	18	SFI on	High		
		3	19	—			
		4	20	—			
		5	21	—			
		6	22	Wire brake on	High		
	7	23	Torchbody Xchange	High			
	3	0	24	—			
		1	25	Teach mode	High		
		2	26	—			
		3	27	—			
		4	28	—			
		5	29	Wire sense start	Increasing		
6		30	Wire sense break	Increasing			
2	4	0	32	TWIN mode bit 0	High	See table Value Range for TWIN Mode on page 33	
		1	33	TWIN mode bit 1	High		
		2	34	—			
		3	35	—			
		4	36	—			
		5	37	Documentation mode	High	See table Value Range for Documentation Mode on page 33	
		6	38	—			
	7	39	—				
	5	0	40	—			
		1	41	—			
		2	42	—			
		3	43	—			
		4	44	—			
		5	45	—			
6		46	—				
7	47	Disable process controlled correction	High				

Address				Signal	Activity / data type	Range	Factor
Relative		Absolute					
WORD	BYTE	BIT	BIT				
3	6	0	48	—			
		1	49	—			
		2	50	—			
		3	51	—			
		4	52	—			
		5	53	—			
		6	54	—			
	7	0	56	ExtInput1 => OPT_Output 1	High		
		1	57	ExtInput2 => OPT_Output 2	High		
		2	58	ExtInput3 => OPT_Output 3	High		
		3	59	ExtInput4 => OPT_Output 4	High		
		4	60	ExtInput5 => OPT_Output 5	High		
		5	61	ExtInput6 => OPT_Output 6	High		
		6	62	ExtInput7 => OPT_Output 7	High		
4	8	0–7	64–71	Welding characteristic- / Job number	UINT16	0 to 1000	1
	9	0–7	72–79				
5	10, 11	0–7	80–95	<i>For the welding processes MIG/MAG pulse synergic, MIG/MAG standard synergic, MIG/MAG standard manual, MIG/MAG PMC, MIG/MAG LSC, CMT, ConstantWire:</i> Wire feed speed command value	SINT16	-327.68 to 327.67 [m/min]	100
				<i>For job mode:</i> Power correction	SINT16	-20.00 to 20.00 [%]	100

Address				Signal	Activity / data type	Range	Factor
Relative		Absolute					
WORD	BYTE	BIT	BIT				
6	12, 13	0-7	96-111	For the welding processes MIG/MAG pulse synergic, MIG/MAG standard synergic, MIG/MAG PMC, MIG/MAG LSC, CMT: Arclength correction	SINT16	-10.0 to 10.0 [steps]	10
				For the welding process MIG/MAG standard manual: Welding voltage	UINT16	0.0 to 6553.5 [V]	10
				For job mode: Arclength correction	SINT16	-10.0 to 10.0 [steps]	10
				For the welding process ConstantWire: Hotwire current	UINT16	0.0 to 6553.5 [A]	10
7	14, 15	0-7	112-127	For the welding processes MIG/MAG pulse synergic, MIG/MAG standard synergic, MIG/MAG PMC, MIG/MAG LSC, CMT: Pulse-/dynamic correction	SINT16	-10.0 to 10.0 [steps]	10
				For the welding process MIG/MAG standard manual: Dynamic	UINT16	0.0 to 10.0 [steps]	10
8	16	0-7	128-135	Wire retract correction	UINT16	0.0 to 10.0	10
	17	0-7	136-143				
9	18	0-7	144-151	Welding speed	UINT 16	0 to 1000 [cm/min]	10
	19	0-7	152-159				
10	20	0-7	160-167	Process controlled correction		See table Value range for Process controlled correction on page 34	
	21	0-7	168-175				
11	22	0-7	176-183	—			
	23	0-7	184-191				
12	24	0-7	192-199	—			
	25	0-7	200-207				
13	26	0-7	208-215	—			
	27	0-7	216-223				

Address				Signal	Activity / data type	Range	Factor
Relative		Absolute					
WORD	BYTE	BIT	BIT				
14	28	0-7	224-231	—			
	29	0-7	232-239				
15	30	0-7	240-247	Wire forward / backward length	UINT16	OFF / 1 to 65535 [mm]	1
	31	0-7	248-255				
16	32	0-7	256-263	Wire sense edge detection	UINT16	OFF / 0.5 to 20 [mm]	10
	33	0-7	264-271				
17	34	0-7	272-279	—			
	35	0-7	280-287				
18	36	0-7	288-295	—			
	37	0-7	296-303				
19	38	0-7	304-311	Seam number	UINT16	0 to 65,535	1
	39	0-7	312-319				
20	40	0	320	Disable Start-End-Parameter	High		
		1	321	Disable SFI-Parameter	High		
		2	322	Disable SP-Parameter	High		
		3	323	Disable Process-Mix-Parameter	High		
		4	324	Disable gas-settings	High		
		5	325	Disable delaytime flowsensor	High		
		6	326	Disable inching value	High		
	7	327	Disable process controlled correction 2	High			
	41	0	328	Enable TWIN-Parameter	High		
		1	329	—			
		2	330	—			
		3	331	—			
		4	332	—			
		5	333	—			
6		334	—				
7	335	—					

Address				Signal	Activity / data type	Range	Factor
Relative		Absolute					
WORD	BYTE	BIT	BIT				
21	42	0	336	Enable resistance overwrite	High		
		1	337	Set resistance value	High		
		2	338	Enable inductance overwrite	High		
		3	339	Set inductance value	High		
		4	340	—			
		5	341	—			
		6	342	—			
	7	343	—				
	43	0	344	Cooling unit operating mode Bit 0	High	See table Value Range for Cooling Unit Operating Mode on page 34	
		1	345	Cooling unit operating mode Bit 1	High		
		2	346	Cooling unit operating mode Bit 2	High		
		3	347	Pulse synchronization ratio Bit 0	High		
		4	348	Pulse synchronization ratio Bit 1	High		
		5	349	—			
6		350	—				
7	351	—					
22	44	0–7	352–359	Gas preflow	UINT 16	0 to 9.9 [s]	10
	45	0–7	360–367				
23	46	0–7	368–375	Gas postflow	UINT 16	0 to 60.0 [s]	10
	47	0–7	376–383				
24	48	0–7	384–391	Inching Value	SINT 16	0.5 to 25 [m/min]	100
	49	0–7	392–399				
25	50	0–7	400–407	Delay time flow sensor	UINT 16	5 to 25 [steps of 5]	1
	51	0–7	408–415				
26	52	0–7	416–423	Gas Command Value	UINT 16	0.5 to 30.0 [l/min]	10
	53	0–7	424–431				
27	54	0–7	432–439	Gas factor	UINT 16	0.9 to 20.0 [l/min]	100
	55	0–7	440–447				
28	56	0–7	448–455	Ignition time out	UINT 16	5 to 100 [steps]	1
	57	0–7	456–463				
29	58	0–7	464–471	S2T-Starting current	UINT 16	0 to 200 [%]	1
	59	0–7	472–479				

Address				Signal	Activity / data type	Range	Factor
Relative		Absolute					
WORD	BYTE	BIT	BIT				
30	60	0-7	480-487	S2T-Starting current time	UINT 16	Off (0.0) / 0.1 to 10.0 [s]	10
	61	0-7	488-495				
31	62	0-7	496-503	S2T Slope 1	UINT 16	0 to 9.9 [s]	10
	63	0-7	504-511				
32	64	0-7	512-519	S2T Slope 2	UINT 16	0 to 9.9 [s]	10
	65	0-7	520-527				
33	66	0-7	528-535	S2T End current	UINT 16	0 to 200 [%]	1
	67	0-7	536-543				
34	68	0-7	544-551	S2T End current time	UINT 16	Off (0.0) / 0.1 to 10.0 [s]	10
	69	0-7	552-559				
35	70	0-7	560-567	S2T Start Arclength correction	SINT 16	-10 to +10	10
	71	0-7	568-575				
36	72	0-7	576-583	S2T End Arclength correction	SINT 16	-10 to +10	10
	73	0-7	584-591				
37	74	0-7	592-599	SFI Hotstart	UINT 16	Off (0.0) / 0.01 to 2.00 [s]	100
	75	0-7	600-607				
38	76	0-7	608-615	SP Delta wire feed	UINT 16	0.1 to 6	10
	77	0-7	616-623				
39	78	0-7	624-631	SP Frequency	UINT 16	0.5 to 3	10
	79	0-7	632-639				
40	80	0-7	640-647	SP Duty Cycle	UINT 16	10 to 90	1
	81	0-7	648-655				
41	82	0-7	656-663	SP Arc length correction high	SINT 16	-10 to +10	10
	83	0-7	664-671				
42	84	0-7	672-679	SP Arc length correction low	SINT 16	-10 to +10	10
	85	0-7	680-687				
43	86	0-7	688-695	Process-Mix High power time correction	SINT 16	-10 to +10	10
	87	0-7	696-703				
44	88	0-7	704-711	Process-Mix Low power time correction	SINT 16	-10 to +10	10
	89	0-7	712-719				
45	90	0-7	720-727	Process-Mix Low power correction	SINT 16	-10 to +10	10
	91	0-7	728-735				
46	92	0-7	736-743	Process controlled correction 2		See table Value range for Process controlled correction 2 on page 34	
	93	0-7	744-751				

Address				Signal	Activity / data type	Range	Factor
Relative		Absolute					
WORD	BYTE	BIT					
47	94	0-7	752-759	Phase shift Lead/Trail	UINT 8	Auto / 0 to 95 [%]	
	95	0-7	760-767	Ignition delay Trail	UINT 8	Auto / Off / 0.00 to 2.00 [s]	
48	96	0-7	768-775	—			
	97	0-7	776-783				
49	98	0-7	784-791	—			
	99	0-7	792-799				
50	100	0-7	800-807	Resistance	UINT 16	0 to +400 [mOhm]	10
	101	0-7	808-815				
51	102	0-7	816-823	Inductance	UINT 16	0 to +250 [microhenries]	10
	103	0-7	824-831				

Value range for Working mode

Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Description
0	0	0	0	0	Internal parameter selection
0	0	0	0	1	Special 2-step mode characteristics
0	0	0	1	0	Job mode
0	1	0	0	0	2-step mode characteristics
1	1	0	0	0	R/L measurement
1	1	0	0	1	R/L alignment

Value range for operating mode

Value Range for TWIN Mode

Bit 1	Bit 0	Description
0	0	TWIN Single mode
0	1	TWIN Lead mode
1	0	TWIN Trail mode
1	1	Reserved

Value range for TWIN mode

Value Range for Documentation Mode

Bit 0	Description
0	Seam number of power source (internal)

Bit 0	Description
1	Seam number of robot (Word 19)

Value range for documentation mode

Value range for Process controlled correction

Process	Signal	Activity / data type	Value range configuration range	Unit	Factor
PMC	Arc length stabilizer	SINT16	-3276.8 to +3276.7 0.0 to +5.0	Volts	10

Value range for process-dependent correction

Value Range for Cooling Unit Operating Mode

Bit 2	Bit 1	Bit 0	Description
0	0	0	auto
0	0	1	eco
0	1	0	on
0	0	0	off

Value Range for Cooling Unit Operating Mode

Value range for Process controlled correction 2

Process	Signal	Activity / data type	Value range configuration range	Unit	Factor
PMC	Penetration stabilizer	SINT16	-3276.8 to +3276.7 0.0 to +10.0	m/min	10

Value range for process-dependent correction 2

Availability of the output signals

The output signals listed below are available from firmware V3.2.30 of the TPS/i power source.

Output signals (from power source to robot)

Address				Signal	Activity / data type	Range	Factor
Relative		Absolute					
WORD	BYTE	BIT	BIT				
0	0	0	0	Heartbeat Powersource	High / Low	1 Hz	
		1	1	Power source ready	High		
		2	2	Warning	High		
		3	3	Process active	High		
		4	4	Current flow	High		
		5	5	Arc stable- / touch signal	High		
		6	6	Main current signal	High		
		7	7	Touch signal	High		
	1	0	8	Collisionbox active	Low	0 = collision or cable break	
		1	9	Robot Motion Release	High		
		2	10	Wire stick workpiece	High		
		3	11	—			
		4	12	Short circuit contact tip	High		
		5	13	Parameter selection internally	High		
		6	14	Characteristic number valid	High		
	7	15	Torch body gripped	High			

Address				Signal	Activity / data type	Range	Factor
Relative		Absolute					
WORD	BYTE	BIT	BIT				
1	2	0	16	Command value out of range	High		
		1	17	Correction out of range	High		
		2	18	—			
		3	19	Limit Signal	High		
		4	20	—			
		5	21	—			
		6	22	Main supply status	Low		
	7	23	—				
	3	0	24	Sensor status 1	High	See table Assignment of Sensor Statuses 1–4 on page 40	
		1	25	Sensor status 2	High		
		2	26	Sensor status 3	High		
		3	27	Sensor status 4	High		
		4	28	—			
		5	29	—			
6		30	—				
7	31	—					
2	4	0	32	Function status Bit 0	High	See table Value Range for Function status on page 40	
		1	33	Function status Bit 1	High		
		2	34	—			
		3	35	Safety status Bit 0	High	See table Value range Safety status on page 41	
		4	36	Safety status Bit 1	High		
		5	37	—			
		6	38	Notification	High		
	7	39	System not ready	High			
	5	0	40	—			
		1	41	—			
		2	42	—			
		3	43	—			
		4	44	—			
		5	45	—			
6		46	—				
7	47	—					

Address				Signal	Activity / data type	Range	Factor
Relative		Absolute					
WORD	BYTE	BIT	BIT				
3	6	0	48	Process Bit 0	High	See table Value Range for Process Bit on page 41	
		1	49	Process Bit 1	High		
		2	50	Process Bit 2	High		
		3	51	Process Bit 3	High		
		4	52	Process Bit 4	High		
		5	53	—			
		6	54	Gas nozzle touched	High		
	7	55	TWIN synchronisation active	High			
	7	0	56	ExtOutput1 <= OPT_Input1	High		
		1	57	ExtOutput2 <= OPT_Input2	High		
		2	58	ExtOutput3 <= OPT_Input3	High		
		3	59	ExtOutput4 <= OPT_Input4	High		
		4	60	ExtOutput5 <= OPT_Input5	High		
		5	61	ExtOutput6 <= OPT_Input6	High		
6		62	ExtOutput7 <= OPT_Input7	High			
	7	63	ExtOutput8 <= OPT_Input8	High			
4	8	0-7	64-71	Welding voltage	UINT16	0.0 to 655.35 [V]	100
	9	0-7	72-79				
5	10	0-7	80-87	Welding current	UINT16	0.0 to 6553.5 [A]	10
	11	0-7	88-95				
6	12	0-7	96-103	Wire feed speed	SINT16	-327.68 to 327.67 [m/min]	100
	13	0-7	104-111				
7	14	0-7	112-119	Actual real value for seam tracking	UINT16	0 to 6.5535	1000 0
	15	0-7	120-127				
8	16	0-7	128-135	Error number	UINT16	0 to 65,535	1
	17	0-7	136-143				
9	18	0-7	144-151	Warning number	UINT16	0 to 65,535	1
	19	0-7	152-159				
10	20	0-7	160-167	Motor current M1	SINT16	-327.68 to 327.67 [A]	100
	21	0-7	168-175				
11	22	0-7	176-183	Motor current M2	SINT16	-327.68 to 327.67 [A]	100
	23	0-7	184-191				
12	24	0-7	192-199	Motor current M3	SINT16	-327.68 to 327.67 [A]	100
	25	0-7	200-207				
13	26	0-7	208-215	—			
	27	0-7	216-223				

Address				Signal	Activity / data type	Range	Factor
Relative		Absolute					
WORD	BYTE	BIT	BIT				
14	28	0-7	224-231	—			
	29	0-7	232-239				
15	30	0-7	240-247	—			
	31	0-7	248-255				
16	32	0-7	256-263	Wire position	SINT16	-327.68 to 327.67 [A]	100
	33	0-7	264-271				
17	34	0-7	272-279	—			
	35	0-7	280-287				
18	36	0-7	288-295	—			
	37	0-7	296-303				
19	38	0-7	304-311	—			
	39	0-7	312-319				
20	40	0	320	Gas process line 1 pushed	High		
		1	321	—			
		2	322	Wire feeder 1 available	High		
		3	323	Wire feeder 2 available	High		
		4	324	Wire feeder 3 available	High		
		5	325	Gas controller available	High		
		6	326	—			
	41	0	328	OPT/i Safety Stop available	High		
		1	329	—			
		2	330	—			
		3	331	—			
		4	332	—			
		5	333	—			
		6	334	—			
21	42	0-7	336-343	—			
	43	0-7	344-351				
22	44	0-7	352-359	Cooler temperature	SINT16	-100 to +200 [°C]	10
	45	0-7	360-367				
23	46	0-7	368-375	Cooler flow rate	SINT16	-100 to +100 [l/min]	100
	47	0-7	376-383				
24	48	0-7	384-391	Real energy actual value	UINT16	0 to 6553.5 [kJ]	10
	49	0-7	392-399				

Address				Signal	Activity / data type	Range	Factor
Relative		Absolute					
WORD	BYTE	BIT	BIT				
25	50	0-7	400-407	Power value	UINT16	0 to 6553.5 [kW]	10
	51	0-7	408-415				
26	52	0-7	416-423	Hour meter power on	UINT32	0 to 100,000 [h]	10
	53	0-7	424-431				
27	54	0-7	432-439				
	55	0-7	440-447				
28	56	0-7	448-455	Hour meter current flow	UINT32	0 to 100,000 [h]	10
	57	0-7	456-463				
29	58	0-7	464-471				
	59	0-7	472-479				
30	60	0-7	480-487	—			
	61	0-7	488-495				
31	62	0-7	496-503	—			
	63	0-7	504-511				
32	64	0-7	512-519	Real value welding voltage	UINT16	0.0 to 655.35 [V]	100
	65	0-7	520-527				
33	66	0-7	528-535	Real value welding current	UINT16	0.0 to 6553.5 [A]	10
	67	0-7	536-543				
34	68	0-7	544-551	Real value wire feed speed	SINT16	-327.68 to 327.67 [m/min]	100
	69	0-7	552-559				
35	70	0-7	560-567	MIG gas real value	UINT16	0.0 to 100.0	10
	71	0-7	568-575				
36	72	0-7	576-583	Feeder inching speed	SINT16	-327.68 to 327.67	100
	73	0-7	584-591				
37	74	0-7	592-599	—			
	75	0-7	600-607				
38	76	0-7	608-615	—			
	77	0-7	616-623				
39	78	0-7	624-631	—			
	79	0-7	632-639				
40	80	0-7	640-647	—			
	81	0-7	648-655				
41	82	0-7	656-663	—			
	83	0-7	664-671				
42	84	0-7	672-679	—			
	85	0-7	680-687				

Address				Signal	Activity / data type	Range	Factor
Relative		Absolute					
WORD	BYTE	BIT					
43	86	0-7	688-695	—			
	87	0-7	696-703				
44	88	0-7	704-711	—			
	89	0-7	712-719				
45	90	0-7	720-727	—			
	91	0-7	728-735				
46	92	0-7	736-743	—			
	93	0-7	744-751				
47	94	0-7	752-759	—			
	95	0-7	760-767				
48	96	0-7	768-775	—			
	97	0-7	776-783				
49	98	0-7	784-791	—			
	99	0-7	792-799				
50	100	0-7	800-807	Resistance	UINT 16	0 to +400 [mOhm]	10
	101	0-7	808-815				
51	102	0-7	816-823	Inductance	UINT 16	0 to +250 [microhenries]	10
	103	0-7	824-831				

Assignment of Sensor Statuses 1-4

Signal	Description
Sensor status 1	OPT/i WF R wire end (4,100,869)
Sensor status 2	OPT/i WF R wire drum (4,100,879)
Sensor status 3	OPT/i WF R ring sensor (4,100,878)
Sensor status 4	Wire buffer set CMT TPS/i (4,001,763)

Value Range for Function status

Bit 1	Bit 0	Description
0	0	inactive
0	1	idle
1	0	finished
1	1	Error

Value range for function status

**Value range
Safety status**

Bit 1	Bit 0	Description
0	0	Reserve
0	1	Hold
1	0	Stop
1	1	Not installed / active

**Value Range for
Process Bit**

Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Description
0	0	0	0	0	No internal parameter selection or process
0	0	0	0	1	MIG/MAG pulse synergic
0	0	0	1	0	MIG/MAG standard synergic
0	0	0	1	1	MIG/MAG PMC
0	0	1	0	0	MIG/MAG LSC
0	0	1	0	1	MIG/MAG standard manual
0	0	1	1	0	Electrode
0	0	1	1	1	TIG
0	1	0	0	0	CMT
0	1	0	0	1	ConstantWire

Input and Output Signals - DeviceNet

Data types

The following data types are used:

- **UINT16** (Unsigned Integer)
Whole number in the range from 0 to 65535
- **SINT16** (Signed Integer)
Whole number in the range from -32768 to 32767

Conversion examples:

- for a positive value (SINT16)
e.g. desired wire speed x factor
 $12.3 \text{ m/min} \times 100 = 1230_{\text{dec}} = 04CE_{\text{hex}}$
- for a negative value (SINT16)
e.g. arc correction x factor
 $-6.4 \times 10 = -64_{\text{dec}} = FFC0_{\text{hex}}$

Availability of input signals

The input signals listed below are available from firmware V3.2.30 of the TPS/i power source.

Input signals (from robot to power source)

Address				Signal	Activity / data type	Range	Factor	Process image		
Relative			Abso- lute					Standard	Economy	
WORD	BYTE	BIT	BIT							
0	0	0	0	Welding Start	Increasing			✓	✓	
		1	1	Robot ready	High					
		2	2	Working mode Bit 0	High	See table Value Range for Working Mode on page 48				
		3	3	Working mode Bit 1	High					
		4	4	Working mode Bit 2	High					
		5	5	Working mode Bit 3	High					
		6	6	Working mode Bit 4	High					
	7	7	—							
	1	0	8	Gas on	Increasing					
		1	9	Wire forward	Increasing					
		2	10	Wire backward	Increasing					
		3	11	Error quit	Increasing					
		4	12	Touch sensing	High					
		5	13	Torch blow out	Increasing					
		6	14	Processline selection Bit 0	High	See table Value range Process line selection on page 49				
7		15	Processline selection Bit 1	High						

Address				Signal	Activity / data type	Range	Factor	Process image	
Relative			Abso-lute					Standard	Economy
WORD	BYTE	BIT	BIT						
1	2	0	16	Welding Simulation	High			✓	✓
		1	17	Synchro pulse on	High				
		2	18	—					
		3	19	—					
		4	20	—					
		5	21	—					
		6	22	Wire brake on	High				
	7	23	Torchbody Xchange	High					
	3	0	24	—					
		1	25	Teach mode	High				
		2	26	—					
		3	27	—					
		4	28	—					
		5	29	Wire sense start	Increas- ing				
6		30	Wire sense break	Increas- ing					
7	31	—							

Address				Signal	Activity / data type	Range	Factor	Process image	
Relative			Abso- lute					Standard	Economy
WORD	BYTE	BIT	BIT						
2	4	0	32	TWIN mode Bit 0	High	See table Value Range for TWIN Mode on page 49			
		1	33	TWIN mode Bit 1	High				
		2	34	—					
		3	35	—					
		4	36	—					
		5	37	Documentation mode	High	See table Value Range for Documentation Mode on page 49			
		6	38	—					
		7	39	—					
	5	0	40	—					
		1	41	—					
		2	42	—					
		3	43	—					
		4	44	—					
		5	45	—					
6		46	—						
7	47	Disable process controlled correction	High						

Address				Signal	Activity / data type	Range	Factor	Process image	
Relative			Abso-lute					Standard	Economy
WORD	BYTE	BIT	BIT						
3	6	0	48	—				✓	✓
		1	49	—					
		2	50	—					
		3	51	—					
		4	52	—					
		5	53	—					
		6	54	—					
	7	55	—						
	7	0	56	ExtInput1 => OPT_Output 1	High				
		1	57	ExtInput2 => OPT_Output 2	High				
		2	58	ExtInput3 => OPT_Output 3	High				
		3	59	ExtInput4 => OPT_Output 4	High				
		4	60	ExtInput5 => OPT_Output 5	High				
		5	61	ExtInput6 => OPT_Output 6	High				
6		62	ExtInput7 => OPT_Output 7	High					
	7	63	ExtInput8 => OPT_Output 8	High					
4	8	0-7	64-71	Welding characteristic- / Job number	UINT16	0 to 1000	1	✓	✓
	9	0-7	72-79						
5	10, 11	0-7	80-95	<i>For the welding processes MIG/MAG pulse synergic, MIG/MAG standard synergic, MIG/MAG standard manual, MIG/MAG PMC, MIG/MAG LSC, CMT, ConstantWire:</i>	SINT16	-327.68 to 327.67 [m/min]	100	✓	✓
				Wire feed speed command value <i>For job mode:</i> Power correction	SINT16	-20.00 to 20.00 [%]	100		

Address				Signal	Activity / data type	Range	Factor	Process image	
Relative			Abso- lute					Standard	Economy
WORD	BYTE	BIT	BIT						
6	12, 13	0-7	96-111	For the welding processes MIG/MAG pulse synergic, MIG/MAG standard synergic, MIG/MAG PMC, MIG/MAG LSC, CMT: Arclength correction	SINT16	-10.0 to 10.0 [steps]	10		
				For the welding process MIG/MAG standard manual: Welding voltage	UINT16	0.0 to 6553.5 [V]	10	✓	✓
				For job mode: Arclength correction	SINT16	-10.0 to 10.0 [steps]	10		
				For the welding process ConstantWire: Hotwire current	UINT16	0.0 to 6553.5 [A]	10		
7	14, 15	0-7	112-127	For the welding processes MIG/MAG pulse synergic, MIG/MAG standard synergic, MIG/MAG PMC, MIG/MAG LSC, CMT: Pulse-/dynamic correction	SINT16	-10.0 to 10.0 [steps]	10	✓	✓
				For the welding process MIG/MAG standard manual: Dynamic	UINT16	0.0 to 10.0 [steps]	10		
8	16	0-7	128-135	Wire retract correction	UINT16	0.0 to 10.0 [steps]	10	✓	
	17	0-7	136-143						
9	18	0-7	144-151	Welding speed	UINT16	0.0 to 1000.0 [cm/min]	10	✓	
	19	0-7	152-159						
10	20	0-7	160-167	Process controlled correction		See table Value range for Process controlled correction on page 49		✓	
	21	0-7	168-175						

Address				Signal	Activity / data type	Range	Factor	Process image	
Relative			Abso- lute					Standard	Economy
WORD	BYTE	BIT	BIT						
11	22	0-7	176-183	—				✓	
	23	0-7	184-191						
12	24	0-7	192-199	—				✓	
	25	0-7	200-207						
13	26	0-7	208-215	—				✓	
	27	0-7	216-223						
14	28	0-7	224-231	—				✓	
	29	0-7	232-239						
15	30	0-7	240-247	Wire forward / backward length	UINT16	OFF / 1 to 65535 [mm]	1	✓	
	31	0-7	248-255						
16	32	0-7	256-263	Wire sense edge detection	UINT16	OFF / 0.5 to 20.0 [mm]	10	✓	
	33	0-7	264-271						
17	34	0-7	272-279	—				✓	
	35	0-7	280-287						
18	36	0-7	288-295	—				✓	
	37	0-7	296-303						
19	38	0-7	304-311	Seam number	UINT16	0 to 65,535	1	✓	
	39	0-7	312-319						

Value Range for Working Mode

Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Description
0	0	0	0	0	Internal parameter selection
0	0	0	0	1	Special 2-step mode characteristics

Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Description
0	0	0	1	0	Job mode
0	1	0	0	0	2-step mode characteristics
0	1	0	0	1	2-step MIG/MAG standard manual
1	0	0	0	1	Stop coolant pump

Value range for operating mode

Value range Process line selection

Bit 1	Bit 0	Description
0	0	Process line 1 (default)
0	1	Process line 2
1	0	Process line 3
1	1	Reserved

Value range for process line selection

Value Range for TWIN Mode

Bit 1	Bit 0	Description
0	0	TWIN Single mode
0	1	TWIN Lead mode
1	0	TWIN Trail mode
1	1	Reserved

Value range for TWIN mode

Value Range for Documentation Mode

Bit 0	Description
0	Seam number of power source (internal)
1	Seam number of robot (Word 19)

Value range for documentation mode

Value range for Process controlled correction

Process	Signal	Activity / data type	Value range configuration range	Unit	Factor
PMC	Arc length stabilizer	SINT16	-327.8 to +327.7 0.0 to +5.0	Volts	10

Value range for process-dependent correction

Availability of the output signals

The output signals listed below are available from firmware V3.2.30 of the TPS/i power source.

Output Signals (from Power Source to Robot)

Address				Signal	Activity / data type	Range	Factor	Process image		
relative		absolute						Standard	Economy	
WORD	BYTE	BIT	BIT							
0	0	0	0	Heartbeat Powersource	High/Low	1 Hz		✓	✓	
		1	1	Power source ready	High					
		2	2	Warning	High					
		3	3	Process active	High					
		4	4	Current flow	High					
		5	5	Arc stable- / touch signal	High					
		6	6	Main current signal	High					
		7	7	Touch signal	High					
	1	0	8	Collisionbox active	Low	0 = collision or cable break				
		1	9	Robot Motion Release	High					
		2	10	Wire stick workpiece	High					
		3	11	—						
		4	12	Short circuit contact tip	High					
		5	13	Parameter selection internally	High					
		6	14	Characteristic number valid	High					
7	15	Torch body gripped	High							

Address				Signal	Activity / data type	Range	Factor	Process image		
relative		absolute						Standard	Economy	
WORD	BYTE	BIT	BIT							
1	2	0	16	Command value out of range	High			✓	✓	
		1	17	Correction out of range	High					
		2	18	—						
		3	19	Limitsignal	High					
		4	20	—						
		5	21	—						
		6	22	Main supply status	Low					
	7	23	—							
	3	0	24	Sensor status 1	High	See table Assignment of Sensor Statuses 1–4 on page 53				
		1	25	Sensor status 2	High					
		2	26	Sensor status 3	High					
		3	27	Sensor status 4	High					
		4	28	—						
		5	29	—						
6		30	—							
7	31	—								
2	4	0	32	—				✓	✓	
		1	33	—						
		2	34	—						
		3	35	Safety status Bit 0	High	See table Value range Safety status on page 53				
		4	36	Safety status Bit 1	High					
		5	37	—						
		6	38	Notification	High					
	7	39	System not ready	High						
	5	0	40	—						
		1	41	—						
		2	42	—						
		3	43	—						
		4	44	—						
		5	45	—						
6		46	—							
7	47	—								

Address				Signal	Activity / data type	Range	Factor	Process image	
relative		absolute						Standard	Economy
WORD	BYTE	BIT	BIT						
3	6	0	48	Process Bit 0	High	See table Value Range for Process Bit on page 54			
		1	49	Process Bit 1	High				
		2	50	Process Bit 2	High				
		3	51	Process Bit 3	High				
		4	52	Process Bit 4	High				
		5	53	—					
		6	54	Touch signal gas nozzle	High				
	7	55	TWIN synchronization active	High					
	7	0	56	ExtOutput1 <= OPT_Input1	High				
		1	57	ExtOutput2 <= OPT_Input2	High			✓	✓
		2	58	ExtOutput3 <= OPT_Input3	High				
		3	59	ExtOutput4 <= OPT_Input4	High				
		4	60	ExtOutput5 <= OPT_Input5	High				
		5	61	ExtOutput6 <= OPT_Input6	High				
6		62	ExtOutput7 <= OPT_Input7	High					
7		63	ExtOutput8 <= OPT_Input8	High					
4	8	0-7	64-71	Welding voltage	UINT16	0.0 to 655.35 [V]	100	✓	✓
	9	0-7	72-79						
5	10	0-7	80-87	Welding current	UINT16	0.0 to 6553.5 [A]	10	✓	✓
	11	0-7	88-95						
6	12	0-7	96-103	Wire feed speed	SINT16	-327.68 to 327.67 [m/min]	100	✓	✓
	13	0-7	104-111						
7	14	0-7	112-119	Actual real value for seam tracking	UINT16	0 to 6.5535	10000	✓	✓
	15	0-7	120-127						
8	16	0-7	128-135	Error number	UINT16	0 to 65535	1	✓	
	17	0-7	136-143						
9	18	0-7	144-151	Warning number	UINT16	0 to 65535	1	✓	
	19	0-7	152-159						

Address				Signal	Activity / data type	Range	Factor	Process image	
relative		absolute	Standard					Economy	
WORD	BYTE	BIT							
10	20	0-7	160-167	Motor current M1	SINT16	-327.68 to 327.67 [A]	100	✓	
	21	0-7	168-175						
11	22	0-7	176-183	Motor current M2	SINT16	-327.68 to 327.67 [A]	100	✓	
	23	0-7	184-191						
12	24	0-7	192-199	Motor current M3	SINT16	-327.68 to 327.67 [A]	100	✓	
	25	0-7	200-207						
13	26	0-7	208-215	—				✓	
	27	0-7	216-223						
14	28	0-7	224-231	—				✓	
	29	0-7	232-239						
15	30	0-7	240-247	—				✓	
	31	0-7	248-255						
16	32	0-7	256-263	Wire position	SINT16	-327.68 to 327.67 [mm]	100	✓	
	33	0-7	264-271						
17	34	0-7	272-279	—				✓	
	35	0-7	280-287						
18	36	0-7	288-295	—				✓	
	37	0-7	296-303						
19	38	0-7	304-311	—				✓	
	39	0-7	312-319						

Assignment of Sensor Statuses 1–4

Signal	Description
Sensor status 1	OPT/i WF R wire end (4,100,869)
Sensor status 2	OPT/i WF R wire drum (4,100,879)
Sensor status 3	OPT/i WF R ring sensor (4,100,878)
Sensor status 4	Wire buffer set CMT TPS/i (4,001,763)

Value range Safety status

Bit 1	Bit 0	Description
0	0	Reserve
0	1	Hold
1	0	Stop
1	1	Not installed / active

**Value Range for
Process Bit**

Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Description
0	0	0	0	0	No internal parameter selection or process
0	0	0	0	1	MIG/MAG pulse synergic
0	0	0	1	0	MIG/MAG standard synergic
0	0	0	1	1	MIG/MAG PMC
0	0	1	0	0	MIG/MAG LSC
0	0	1	0	1	MIG/MAG standard manual
0	0	1	1	0	Electrode
0	0	1	1	1	TIG
0	1	0	0	0	CMT
0	1	0	0	1	ConstantWire



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