Operating Instructions

RI FB/i FANUC 1.0
RI MOD/i CC-M40 Ethernet/IP - 2P
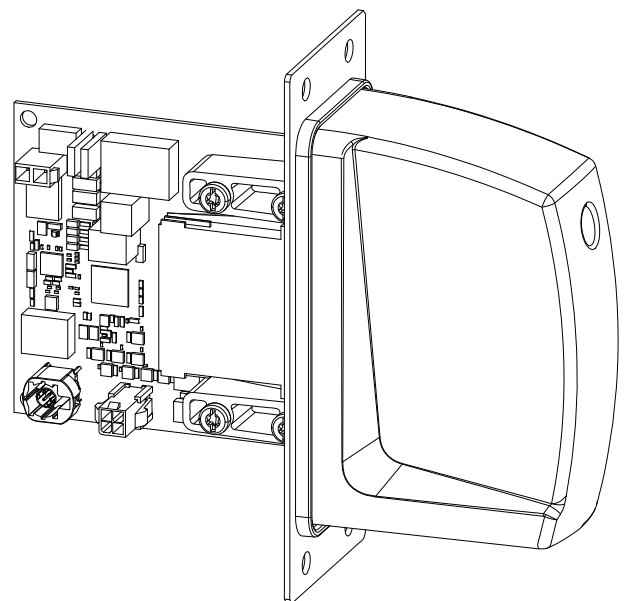
Table of contents

General

Safety

⚠ **WARNING!**

Danger from incorrect operation and work that is not carried out properly.
Serious injury and damage to property may result.
▶ All the work and functions described in this document must only be carried out by trained and qualified personnel.
▶ Read and understand this document.
▶ Read and understand all the Operating Instructions for the system components, especially the safety rules.

⚠ **WARNING!**

Danger from unplanned signal transmission.
Serious injury and damage to property may result.
▶ 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.
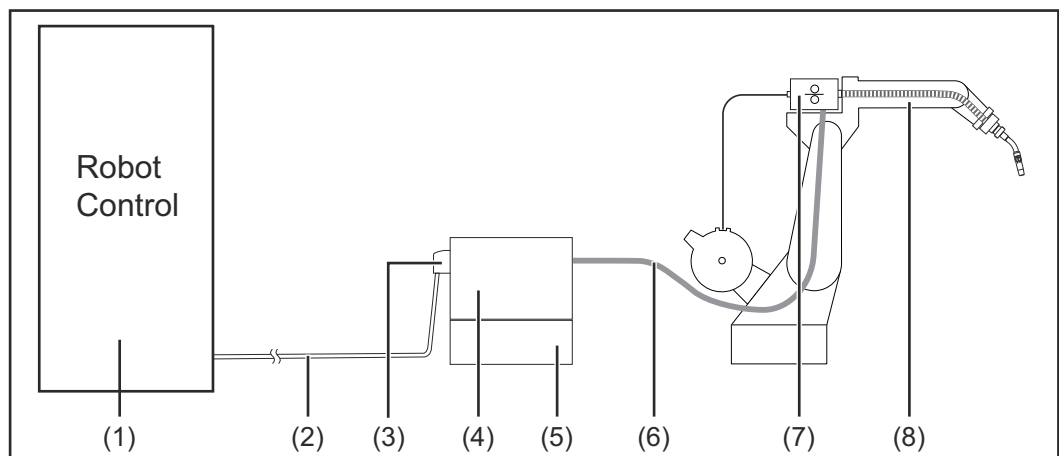
(1)	**Robot control system**
(2)	**SpeedNet data cable**
(3)	**Robot interface**
(4)	**Power source**
(5)	**Cooling unit**
(6)	**Interconnecting hosepack**
(7)	**Wirefeeder**
(8)	**Robot**

Block Diagram
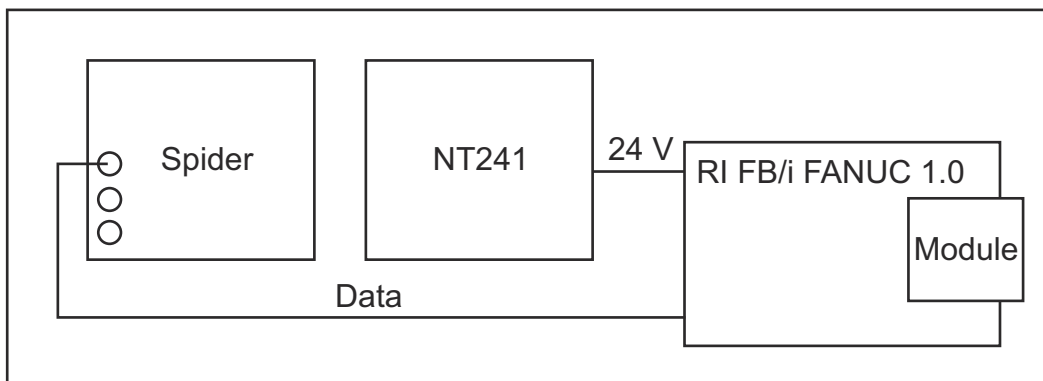
Scope of Supply
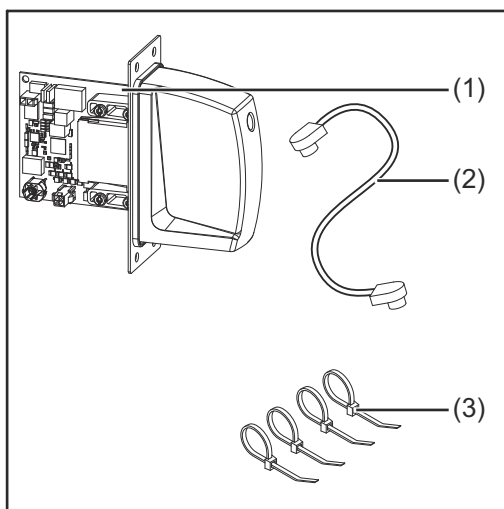
(1)	**RI FB/i FANUC 1.0**
(2)	**Data cable** **4-pin**
(3)	**Cable ties**
(4)	**These Operating Instructions** **(not pictured)**

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.

Connections and Indicators

Connections on the Robot Interface
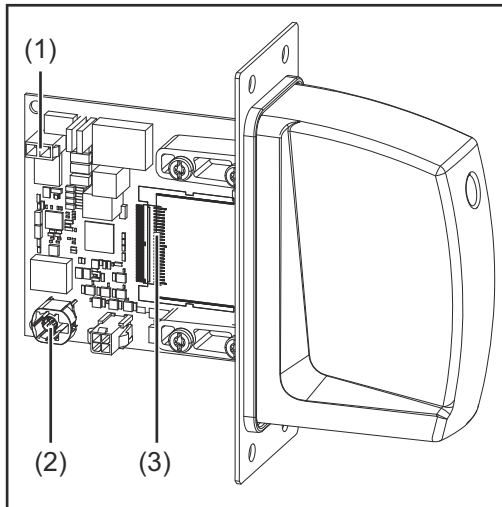
(1)	**Power supply connection 2-pin**
(2)	**SpeedNet data cableconnection 4-pin**
(3)	**Bus module connection**

LEDs on Robot Interface PCB
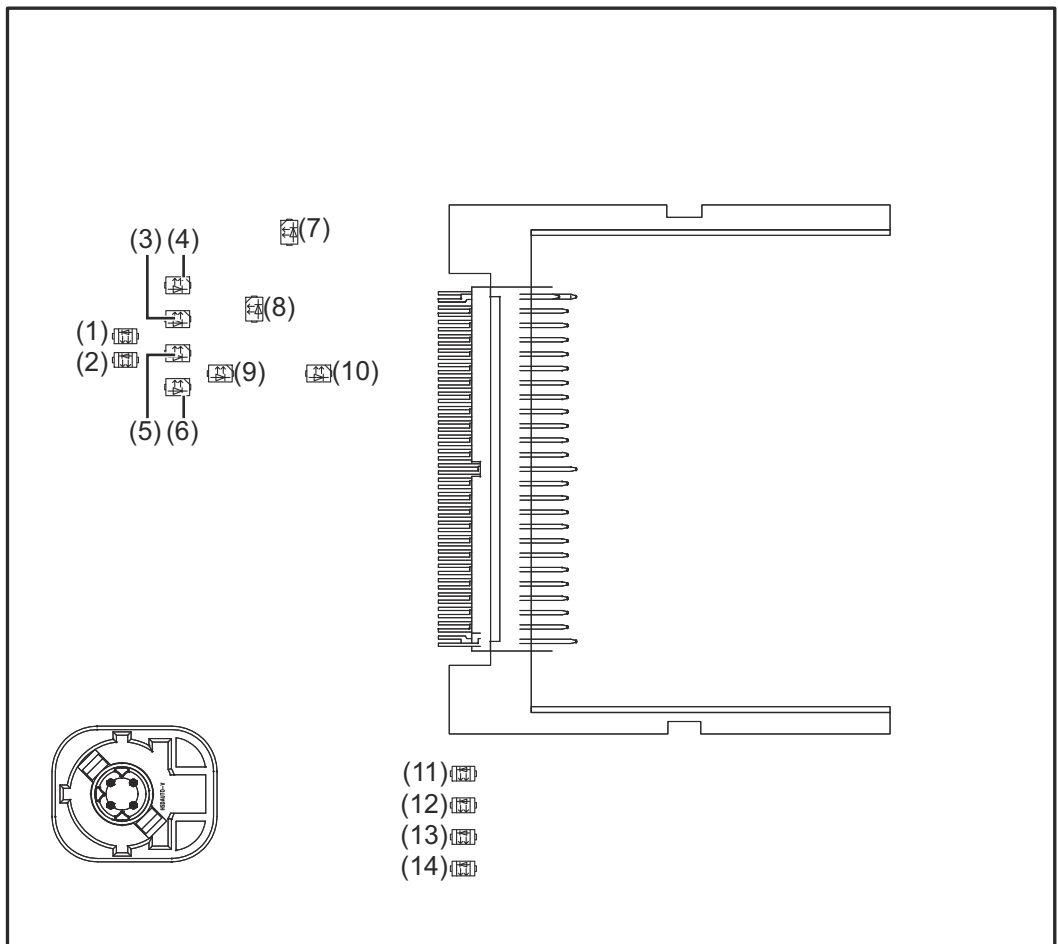
(1)	ETH1 LED	Green	For diagnosing the network connection.
(2)	ETH2 LED	Orange	For details, see section below titled "LEDs for Network Connection Diagnosis"

(3)	LED 3	Green	No function
(4)	LED 4	Green	
(5)	LED 5	Green	- 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	- 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	- 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	- 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 RJ 45 module

(1)	TX+
(2)	TX-
(3)	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).
(6)	RX-
(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 at connection 2 LED
(10)	MS LED (module status)
(11)	RJ-45 Ethernet connection 2
(12)	RJ-45 Ethernet connection 1
(13)	Connection/activity at connection 1 LED
(14)	NS LED (network status)

NS LED (Network Status)	
Status	**Meaning**
Off	No supply voltage or no IP address
Lights up green	Online, one or more connections established (CIP category 1 or 3)
Flashes green	Online, no connections established
Lights up red	Double IP address, serious error
Flashes red	Overrun of time for one or more connections (CIP category 1 or 3)

MS LED (Module Status)	
Status	**Meaning**
Off	No supply voltage
Lights up green	Controlled by a Scanner in Run state and, if CIP Sync is enabled, time is synchronized to a Grandmaster clock
Flashes green	Not configured, Scanner in Idle state, or, if CIP Sync is enabled, time is synchronized Grandmaster clock
Lights up red	Major error - exception state, serious fault, etc.

MS LED (Module Status)	
Flashes red	Correctable error - the module is configured, but there is a difference between the parameters stored and the parameters used (configuration process image, IP address)

Connection/Activity LED	
Status	**Meaning**
Off	No connection, no activity
Lights up green	Connection established (100 Mbit/s)
Flickers green	Activity (100 Mbit/s)
Lights up yellow	Connection established (10 Mbit/s)
Flickers yellow	Activity (10 Mbit/s)

Technical data

Environmental Conditions

<div style="background:yellow">⚠ **CAUTION!**</div>

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

RJ-45 Connection

Transmission technology:
Ethernet

Medium (4 x 2 twisted-pair copper cable):
Category 3 (10 Mbit/s)
Category 5 (100 Mbit/s)

When selecting the cables, plugs, and termination resistances, the ODVA recommendation for the planning and installation of EtherNet/IP systems must be observed.

The EMC tests were carried out by the manufacturer with the cable IE-C5ES8VG0030M40M40-F.

Transmission speed:
10 Mbit/s or 100 Mbit/s

Bus connection:
RJ-45 Ethernet

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.

Parameter	Value
Vendor ID	534_{hex} (1332_{dec})
Device Type	C_{hex} (12_{dec})
Product Code	340_{hex} (832_{dec})

Configuration of robot interface

General
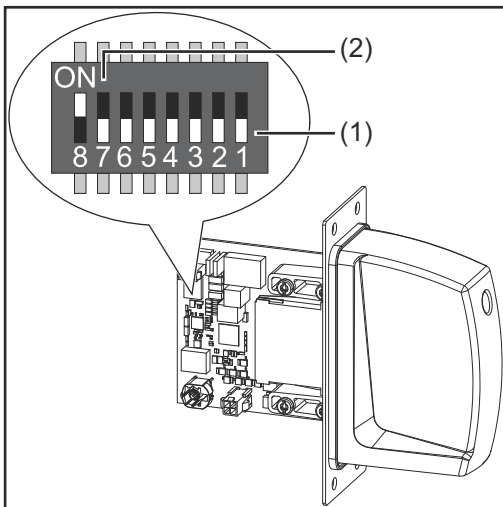
The DIP switch on the robot interface is used to configure:
- The process image (standard image)
- The IP address

Default setting for process image: Positions 7 and 8 of DIP switch set to OFF (1) = standard image = RI FB/i FANUC 1.0

Default setting for IP address = 192.168.0.2:
- Positions 6, 5, 4, 3, 1 of DIP switch set to OFF (1)
- Position 2 of DIP switch set to ON (2)

Configuring the Process Image

DIP Switch								
8	7	6	5	4	3	2	1	**Configuration**
OFF	OFF	-	-	-	-	-	-	Standard-Image (FANUC 1.0)
OFF	ON	-	-	-	-	-	-	Not used
ON	OFF	-	-	-	-	-	-	Not used
ON	ON	-	-	-	-	-	-	Not used

The process image defines the volume of data transferred and the system compatibility.

Setting the IP Address

You can set the IP address as follows:
- Via the DIP switches within the range defined by 192.168.0.xxx (xx = DIP switch setting = 0 to 63)

Setting the Address via the DIP Switches:								
DIP switch								**IP address**
8	7	6	5	4	3	2	1	
-	-	OFF	OFF	OFF	OFF	OFF	ON	192.168.0.1
-	-	OFF	OFF	OFF	OFF	ON	OFF	192.168.0.2
								:
-	-	ON	ON	OFF	ON	ON	OFF	192.168.0.54
-	-	ON	ON	OFF	ON	ON	ON	192.168.0.55

The IP address can be set via positions 1 to 6 of the DIP switch.
The configuration is carried out in binary format. In decimal format, the setting range is 0 through 63.

The following IP address is set via the DIP switches on delivery:
- IP address: 192.168.0.2
- Subnet mask: 255.255.255.0
- Default gateway: 0.0.0.0

Configuring the Robot Interface

1 Set the DIP switch in accordance with the desired configuration

NOTE!

Risk due to invalid DIP switch settings.
This may result in malfunctions.
▶ Whenever changes are made to the DIP switch settings, the interface must be restarted. This is the only way for the changes to take effect.
▶ Restart the interface = interrupting and restoring the power supply or executing the relevant function on the website of the power source (Smart-Manager).

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 restarting.
▶ 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
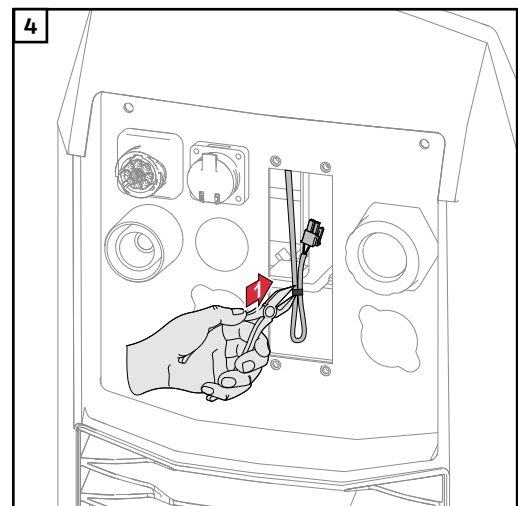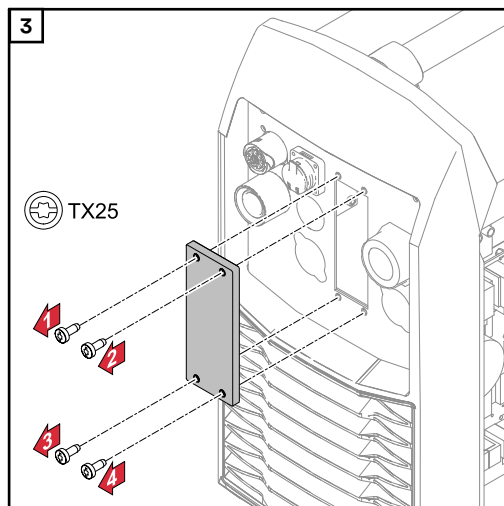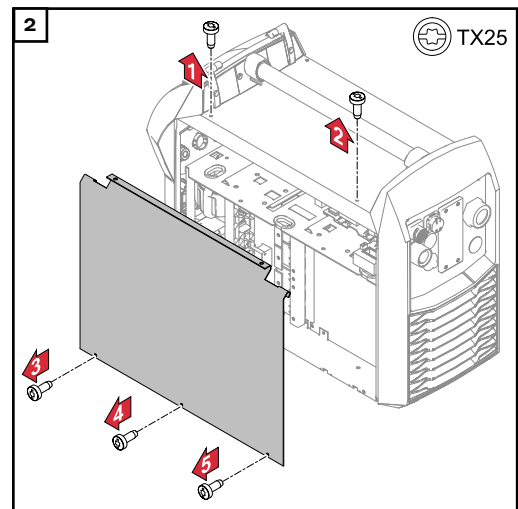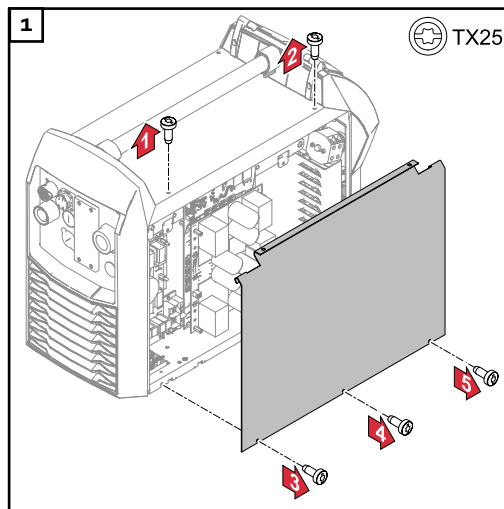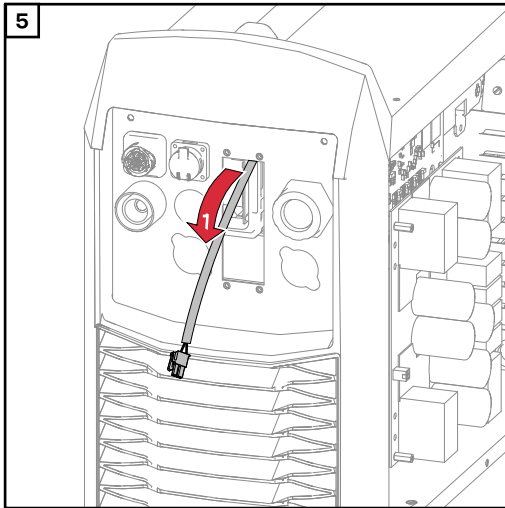
Routing the Data Cable
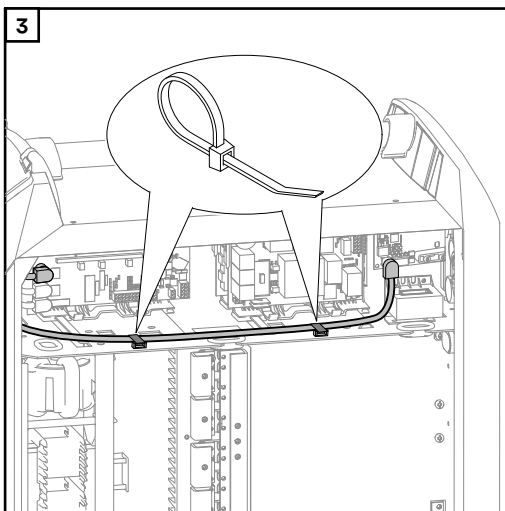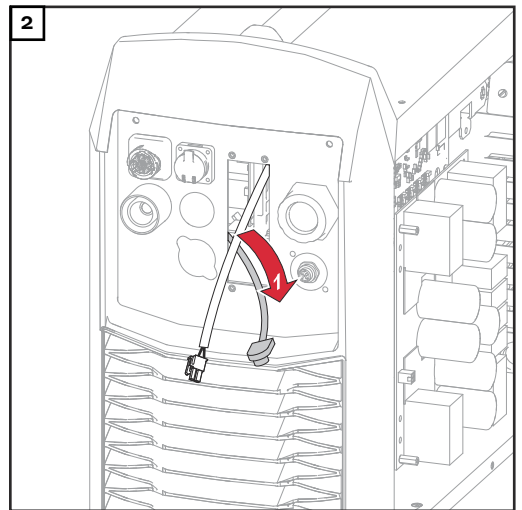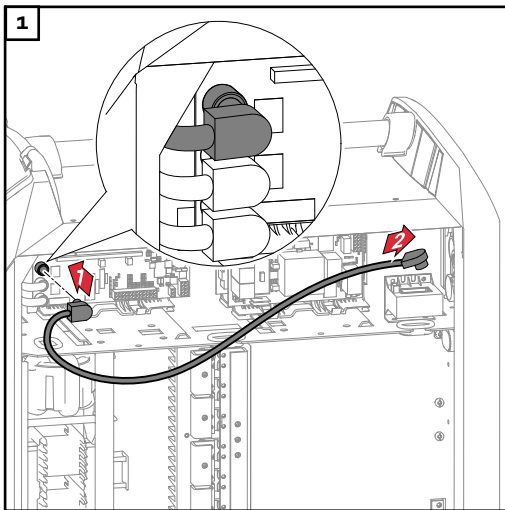
Installing the Robot Interface
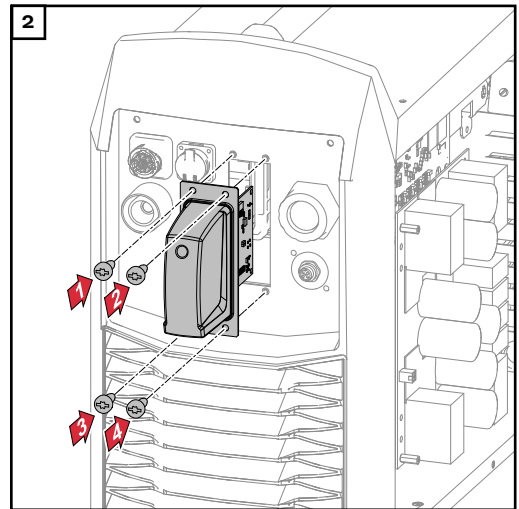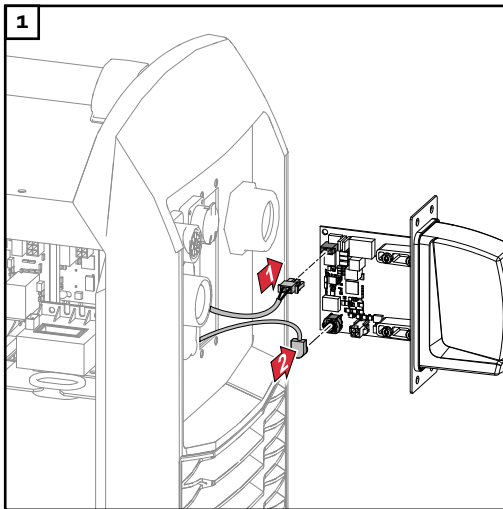
Final Tasks
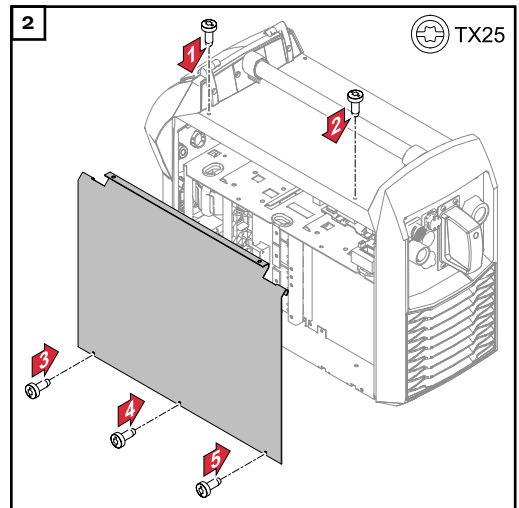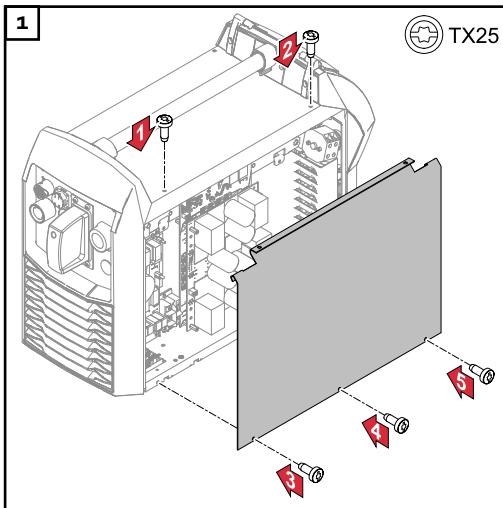
Installing the Bus Module

Safety

<div>

⚠️ **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.

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⚠️ **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.

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Installing the Bus Module
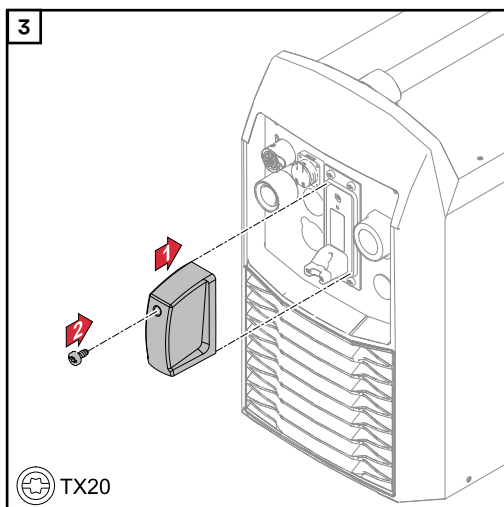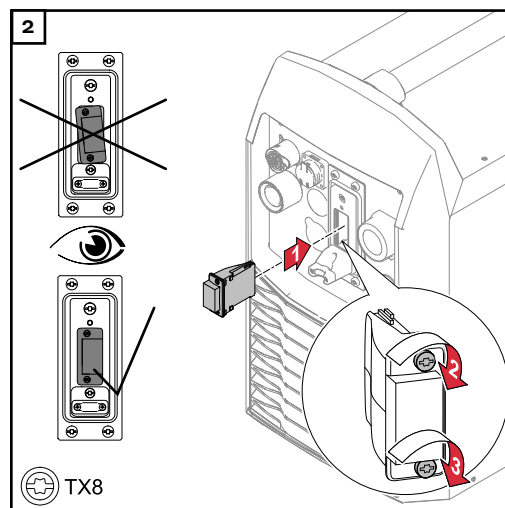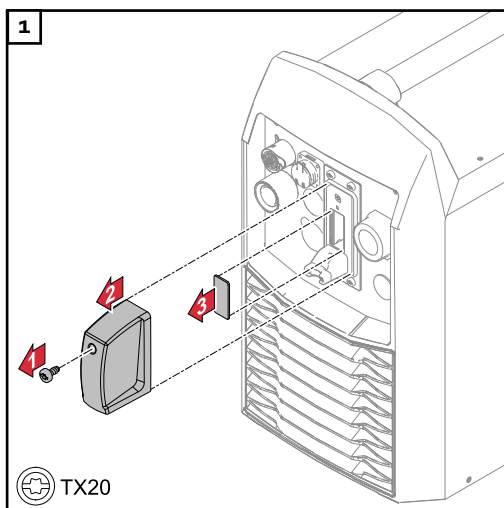
Input and Output Signals Standard Image FA-NUC 1.0

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 m/min x 100 = 1230_{dec} = $04CE_{hex}$

- for a negative value (SINT16)
  e.g. arc correction x factor
  -6.4 x 10 = -64_{dec} = $FFC0_{hex}$

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)

WORD	BYTE	BIT (Relative)	BIT (Absolute)	Signal	Description	Activity / data type	Range	Factor
0	0	0	1	Welding Start		Increasing		
		1	2	Robot ready		High		
		2	3	Working mode Bit 0		High	See table **Value range for Working mode** on page **28**	
		3	4	Working mode Bit 1		High		
		4	5	Working mode Bit 2		High		
		5	6	Working mode Bit 3		High		
		6	7	Working mode Bit 4		High		
		7	8	—				
	1	0	9	Gas on		Increasing		
		1	10	Wire forward		Increasing		
		2	11	Wire backward		Increasing		
		3	12	Error quit		Increasing		
		4	13	Touch sensing		Increasing		
		5	14	Torch blow out		Increasing		
		6	15	Processline selection Bit 0		High	See table **Value range Process line selection** on page **28**	
		7	16	Processline selection Bit 1		High		

Address				Signal	Description	Activity / data type	Range	Factor
Relative			Absolute					
WORD	BYTE	BIT	BIT					
1	2	0	17	Welding Simulation		High		
		1	18	Synchro pulse on		High		
		2	19	SFI on		High		
		3	20	—				
		4	21	—				
		5	22	—				
		6	23	Wire brake on		High		
		7	24	Torchbody Xchange		High		
	3	0	25	—				
		1	26	Teach mode		High		
		2	27	—				
		3	28	—				
		4	29	—				
		5	30	Wire sense start		Increasing		
		6	31	Wire sense break		Increasing		
		7	32	—				

WORD	BYTE	BIT	BIT	Signal	Description	Activity / data type	Range	Factor
			Absolute					
			BIT	Signal				
2	4	0	33	TWIN mode Bit 0		High	See table **Value Range for TWIN Mode** on page **29**	
		1	34	TWIN mode Bit 1		High		
		2	35	—				
		3	36	—				
		4	37	—				
		5	38	Documentation mode		High	See table **Value Range for Document-ation mode** on page **29**	
		6	39	—				
		7	40	—				
	5	0	41	—				
		1	42	—				
		2	43	—				
		3	44	—				
		4	45	—				
		5	46	—				
		6	47	—				
		7	48	Disable process controlled correction		High		

WORD	BYTE	Relative BIT	Absolute BIT	Signal	Description	Activity / data type	Range	Factor
3	6	0	49	—				
		1	50	—				
		2	51	—				
		3	52	—				
		4	53	—				
		5	54	—				
		6	55	—				
		7	56	—				
	7	0	57	ExtInput1 => OPT_Output 1		High		
		1	58	ExtInput2 => OPT_Output 2		High		
		2	59	ExtInput3 => OPT_Output 3		High		
		3	60	ExtInput4 => OPT_Output 4		High		
		4	61	ExtInput5 => OPT_Output 5		High		
		5	62	ExtInput6 => OPT_Output 6		High		
		6	63	ExtInput7 => OPT_Output 7		High		
		7	64	ExtInput8 => OPT_Output 8		High		
4	8	0–7	65–80	Welding characteristic- / Job number	Group 3	UINT16	0 to 1000	1
	9	0–7						
5	10, 11	0–7	81–96	*For the welding processes MIG/MAG pulse synergic, MIG/MAG standard synergic, MIG/MAG standard manual, MIG/MAG PMC, MIG/MAG LSC, CMT, ConstantWire:* Wire feed speed command value	Group 3	SINT16	-327.68 to 327.67 [m/min]	100
				For job operation: Power correction		SINT16	-20.00 to 20.00 [%]	

WORD	BYTE	Relative BIT	Absolute BIT	Signal	Description	Activity / data type	Range	Factor
6	12, 13	0–7	97–112	*Welding processes MIG/MAG pulse synergic, MIG/MAG standard synergic, MIG/MAG PMC, MIG/MAG LSC, CMT:* Arclength correction	Group 3	SINT16	-10.0 to 100.0 [m/min]	10
				For the welding process MIG/MAG standard manual: Welding voltage		UINT16	0.0 to 6553.5 [V]	10
				For job operation: Arclength correction		SINT16	-10.0 to 10.0 [steps]	10
				In the welding process ConstantWire: Hotwire current		UINT16	0.0 to 6553.5 [A]	10
7	14, 15	0–7	113–128	*For the welding processes MIG/MAG pulse synergic, MIG/MAG standard synergic, MIG/MAG PMC, MIG/MAG LSC, CMT:* Pulse-/dynamic correction	Group 3	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	129–144	Wire retract correction	Group 2	UINT16	0 to 10	10
	17	0–7						
9	18	0–7	145–160	Welding speed	Group 3	UINT16	0 to 1000 [cm/min]	10
	19	0–7						
10	20	0–7	161–176	Process controlled correction	Group 2	See table **Value range Process controlled correction** on page **29**		
	21	0–7						
11	22	0–7	177–192	—				
	23	0–7						
12	24	0–7	193–208	—				
	25	0–7						
13	26	0–7	209–224	—				
	27	0–7						

WORD	BYTE	BIT	Absolute BIT	Signal	Description	Activity / data type	Range	Factor
14	28	0–7	225–240	—				
	29	0–7						
15	30	0–7	241–256	Wire forward / backward length		UINT16	OFF / 1 to 65535 [mm]	1
	31	0–7						
16	32	0–7	257–272	Wire sense edge detection	Group 2	UINT16	OFF / 0.5 to 20 [mm]	10
	33	0–7						
17	34	0–7	273–288	—				
	35	0–7						
18	36	0–7	289–304	—				
	37	0–7						
19	38	0–7	305–320	Seam number		UINT 16	0 to 65,535	1
	39	0–7						
20	40	0	321	Disable Start-End-Parameter (Image)		High		
		1	322	Disable SFI-Parameter (Image)		High		
		2	323	Disable SP-Parameter (Image)		High		
		3	324	Disable Process-Mix-Parameter (Image)		High		
		4	325	Disable gas-settings (Image)		High		
		5	326	Disable components setup (TAG)		High		
		6	327	Disable language/units/standards (TAG)		High		
		7	328	Disable process controlled correction 2 (Image)		High		
	41	0	329	Enable arc break monitoring / arc loss		High		
		1	330	—				
		2	331	—				
		3	332	—				
		4	333	—				
		5	334	—				
		6	335	—				
		7	336	—				

Address				Signal	Description	Activity / data type	Range	Factor
Relative			**Absolute**					
WORD	BYTE	BIT	BIT					
21	42	0	337	Enable resistance overwrite		High		
		1	338	Set resistance value		High		
		2	339	Enable inductance overwrite		High		
		3	340	Set inductance value		High		
		4	341	—				
		5	342	—				
		6	343	—				
		7	344	—				
	43	0	345	—				
		1	346	—				
		2	347	—				
		3	348	—				
		4	349	—				
		5	350	—				
		6	351	Command value selection Bit 0		High	See table **Value Range for Command value selection** on page **29**	
		7	352	Reserve (Command value selection Bit 1)				
22	44	0–7	353–368	TAG Start address		UINT 16	0 to 65,535	1
	45	0–7						
23	46	0–7	369–384	TAG value 1	Group 1	UINT 16		1
	47	0–7						
24	48	0–7	385–400	TAG value 2	Group 1	UINT 16		1
	49	0–7						
25	50	0–7	401–416	TAG value 3	Group 1	UINT 16		1
	51	0–7						
26	52	0–7	417–432	TAG value 4	Group 1	UINT 16		1
	53	0–7						
27	54	0–7	433–448	TAG value 5	Group 1	UINT 16		1
	55	0–7						
28	56	0–7	449–456	TAG Quantity		UINT 8	0 to 8	1
	57	0–7	457–464	TAG Command	0x0001 = TAG Read | 0x0002 =TAG Write	UINT 8	0 to 2	1

WORD	BYTE	BIT	BIT	Signal	Description	Activity / data type	Range	Factor
		Relative	Absolute					
29	58	0–7	465–480	Gas preflow	Group 2	UINT 16	0 to 9.9 [s]	10
	59	0–7						
30	60	0–7	481–496	Gas postflow	Group 2	UINT 16	0 to 60 [s]	10
	61	0–7						
31	62	0–7	497–512	Inching Value	Group 2	SINT 16	0.5 to 25 [m/min]	100
	63	0–7						
32	64	0–7	513–528	S2T Starting current	Group 2	UINT 16	0 to 200 [%]	1
	65	0–7						
33	66	0–7	529–544	S2T Starting current time	Group 2	UINT 16	Off (0) / 0.1 to 10 [s]	10
	67	0–7						
34	68	0–7	545–560	S2T Slope 1	Group 2	UINT 16	0 to 9.9 [s]	10
	69	0–7						
35	70	0–7	561–576	S2T Slope 2	Group 2	UINT 16	0 to 9.9 [s]	10
	71	0–7						
36	72	0–7	577–592	S2T End current	Group 2	UINT 16	0 to 200 [%]	1
	73	0–7						
37	74	0–7	593–608	S2T End current time	Group 2	UINT 16	Off (0) / 0.1 to 10 [s]	10
	75	0–7						
38	76	0–7	609–624	S2T Start Arclength correction	Group 2	SINT 16	-10 to +10	10
	77	0–7						
39	78	0–7	625–640	S2T End Arclength correction	Group 2	SINT 16	-10 to +10	10
	79	0–7						
40	80	0–7	641–656	Process-Mix High power time correction	Group 3	SINT 16	-10 to +10	10
	81	0–7						
41	82	0–7	657–672	Process-Mix Low power time correction	Group 3	SINT 16	-10 to +10	10
	83	0–7						
42	84	0–7	673–688	Process-Mix Low power correction	Group 3	SINT 16	-10 to +10	10
	85	0–7						
43	86	0–7	689–704	SFI Hotstart	Group 2	UINT 16	Off (0.0) / 0.01 to 2.00 [s]	100
	87	0–7						
44	88	0–7	705–720	Process controlled correction 2	Group 2	See table **Value range Process controlled correction 2** on page **29**		
	89	0–7						

WORD	BYTE	BIT	BIT (Absolute)	Signal	Description	Activity / data type	Range	Factor
45	90	0−7	721−736	SP Delta wire feed	Group 2	SINT 16	-10 to +10	10
	91	0−7						
46	92	0−7	737−752	SP Frequency	Group 2	SINT 16	-10 to +10	10
	93	0−7						
47	94	0−7	753−768	SP Duty Cycle	Group 2	SINT 16	-100 to +100	1
	95	0−7						
48	96	0−7	769−784	SP Arclength correction high	Group 2	SINT 16	-10 to +10	10
	97	0−7						
49	98	0−7	785−800	SP Arclength correction low	Group 2	SINT 16	-10 to +10	10
	99	0−7						
50	100	0−7	801−816	Resistance	Group 2	UINT 16	0 to +400 [mOhm]	10
	101	0−7						
51	102	0−7	817−832	Inductance	Group 2	UINT 16	0 to +250 [micro-henries]	10
	103	0−7						

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
0	1	0	0	1	MIG/MAG Standard Manual, 2-step
1	1	0	0	0	R/L measurement
1	1	0	0	1	R/L alignment

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

Value range for documentation mode

Value range 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 Command value selection

Bit 351	Description
0	Wirefeeder set value
1	Welding current set value

Value range for set value

Value range Process controlled correction 2

Process	Signal	Activity Data type	Value range Configuration range	Unit	Factor
PMC, LSC	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								
	Relative		Absolute					
WORD	BYTE	BIT	BIT	Signal	Description	Activity / data type	Range	Factor
0	0	0	1	Heartbeat Powersource			1 Hz	
		1	2	Power source ready		High		
		2	3	Warning		High		
		3	4	Process active		High		
		4	5	Current flow		High		
		5	6	Arc stable- / touch signal		High		
		6	7	Main current signal		High		
		7	8	Touch signal		High		
	1	0	9	Collisionbox active		Low	0 = collision or cable break	
		1	10	Robot Motion Release		High		
		2	11	Wire stick workpiece		High		
		3	12	—				
		4	13	Short circuit contact tip		High		
		5	14	Parameter selection internally		High		
		6	15	Characteristic number valid		High		
		7	16	Torch body gripped		High		

WORD	BYTE	BIT	BIT	Signal	Description	Activity / data type	Range	Factor
			Address					
		Relative	**Absolute**					
			BIT					
1	2	0	17	Command value out of range		High		
		1	18	Correction out of range		High		
		2	19	—				
		3	20	Limitsignal		High		
		4	21	—				
		5	22	—				
		6	23	Main supply status		Low		
		7	24	—				
	3	0	25	Sensor status 1		High	See table **Assignment of Sensor Statuses 1–4** on page **36**	
		1	26	Sensor status 2		High		
		2	27	Sensor status 3		High		
		3	28	Sensor status 4		High		
		4	29	—				
		5	30	—				
		6	31	—				
		7	32	—				
2	4	0	33	Function status Bit 0		High	See table **Value Range for Function status** on page **36**	
		1	34	Function status Bit 1		High		
		2	35	—				
		3	36	Safety status Bit 0		High	See table **Value range Safety status** on page **36**	
		4	37	Safety status Bit 1		High		
		5	38	—				
		6	39	Notification		High		
		7	40	System not ready		High		
	5	0	41	—				
		1	42	—				
		2	43	—				
		3	44	—				
		4	45	—				
		5	46	—				
		6	47	—				
		7	48	—				

WORD	BYTE	BIT	BIT	Signal	Description	Activity / data type	Range	Factor
			Address					
			Relative / Absolute					
3	6	0	49	Process Bit 0		High	See table **Value Range for Process Bit** on page **37**	
		1	50	Process Bit 1		High		
		2	51	Process Bit 2		High		
		3	52	Process Bit 3		High		
		4	53	Process Bit 4		High		
		5	54	—				
		6	55	Gas nozzle touched		High		
		7	56	TWIN synchronisation active		High		
	7	0	57	ExtOutput1 <= OPT_Input1		High		
		1	58	ExtOutput2 <= OPT_Input2		High		
		2	59	ExtOutput3 <= OPT_Input3		High		
		3	60	ExtOutput4 <= OPT_Input4		High		
		4	61	ExtOutput5 <= OPT_Input5		High		
		5	62	ExtOutput6 <= OPT_Input6		High		
		6	63	ExtOutput7 <= OPT_Input7		High		
		7	64	ExtOutput8 <= OPT_Input8		High		
4	8	0–7	65–80	Real value welding voltage	Group 3 analog meter	UINT16	0.0 to 327.67 [V]	100
	9	0–7						
5	10	0–7	81–96	Real value welding current	Group 3 analog meter	UINT16	0.0 to 327.67 [A]	10
	11	0–7						
6	12	0–7	97–112	Real value wire feed speed	Analog meter	SINT16	-327.68 to 327.67 [m/min]	100
	13	0–7						
7	14	0–7	113–128	Actual real value for seam tracking		UINT16	0 to 65,535	10000
	15	0–7						
8	16	0–7	129–144	Error number		UINT16	0 to 65,535	1
	17	0–7						
9	18	0–7	145–160	Warning number		UINT16	0 to 65,535	1
	19	0–7						
10	20	0–7	161–176	Motor current M1		SINT16	-327.68 to 327.67 [A]	100
	21	0–7						
11	22	0–7	177–192	Motor current M2		SINT16	-327.68 to 327.67 [A]	100
	23	0–7						

WORD	BYTE	BIT (Relative)	BIT (Absolute)	Signal	Description	Activity / data type	Range	Factor
12	24	0–7	193–208	Motor current M3		SINT16	-327.68 to 327.67 [A]	100
	25	0–7						
13	26	0–7	209–224	—				
	27	0–7						
14	28	0–7	225–240	—				
	29	0–7						
15	30	0–7	241–256	—				
	31	0–7						
16	32	0–7	257–272	Wire position		SINT16	-327.68 to 327.67 [mm]	100
	33	0–7						
17	34	0–7	273–288	—				
	35	0–7						
18	36	0–7	289–304	—				
	37	0–7						
19	38	0–7	305–320	—				
	39	0–7						
20	40	0	321	WebJobEditor enable		High		
		1	322	—				
		2	323	—				
		3	324	—				
		4	325	—				
		5	326	—				
		6	327	—				
		7	328	—				
	41	0	329	—				
		1	330	—				
		2	331	—				
		3	332	—				
		4	333	—				
		5	334	—				
		6	335	—				
		7	336	—				

WORD	BYTE	BIT	BIT	Signal	Description	Activity / data type	Range	Factor
21	42	0	337	—		High		
		1	338	—				
		2	339	—				
		3	340	—				
		4	341	—				
		5	342	—				
		6	343	—				
		7	344	—				
	43	0	345	—				
		1	346	—				
		2	347	—				
		3	348	—				
		4	349	—				
		5	350	—				
		6	351	—				
		7	352	—				
22	44	0–7	353–368	TAG Start adress		UINT16	0 to 65,535	1
	45	0–7						
23	46	0–7	369–384	TAG value 1		UINT16		
	47	0–7						
24	48	0–7	385–400	TAG value 2		UINT16		1
	49	0–7						
25	50	0–7	401–416	TAG value 3		UINT16		1
	51	0–7						
26	52	0–7	417–432	TAG value 4		UINT16		1
	53	0–7						
27	54	0–7	433–448	TAG value 5		UINT16		1
	55	0–7						
28	56	0–7	449–456	TAG Quantity		UINT8	0 to 5	1
	57	0–7	457–464	TAG Command	0x0001 = TAG Read | 0x0002 =TAG Write	UINT8	0 to 2	1
29	58	0–7	465–480	Cooler temperature		SINT16	-100 to +200 [°C]	10
	59	0–7						

Address				Signal	Description	Activity / data type	Range	Factor
WORD	Relative BYTE	Relative BIT	Absolute BIT					
30	60	0–7	481–496	Cooler flow rate		SINT16	-100 to +100 [l/min]	10 0
	61	0–7						
31	62	0–7	497–512	Real energy actual value		UINT16	0 to 6553.5 [kJ]	10
	63	0–7						
32	64	0–7	513–528	Power value		UINT16	0 to 6553.5 [kW]	10
	65	0–7						
33	66	0–7	529–560	Hour meter power on		UINT32	0 to 100000 [h]	10
	67	0–7						
34	68	0–7						
	69	0–7						
35	70	0–7	561–576	Arc on time		UINT32	0 to 100000 [h]	10
	71	0–7						
36	72	0–7	577–592					
	73	0–7						
37	74	0–7	593–608	Gaspreflow		UINT16	0.0 to 9.9 [s]	10
	75	0–7						
38	76	0–7	609–624	Gaspostflow		UINT16	0.0 to 60.0 [s]	10
	77	0–7						
39	78	0–7	625–640	S2T Starting current time		UINT16	Off (0) / 0.1 to 10.0 [s]	10
	79	0–7						
40	80	0–7	641–656	S2T Slope 1		UINT16	0.0 to 9.9 [s]	10
	81	0–7						
41	82	0–7	657–672	S2T Slope 2		UINT16	0.0 to 9.9 [s]	10
	83	0–7						
42	84	0–7	673–688	S2T End current time		UINT16	Off (0) / 0.1 to 10 [s]	10
	85	0–7						
43	86	0–7	689–704	—				
	87	0–7						
44	88	0–7	705–720	—				
	89	0–7						
45	90	0–7	721–736	—				
	91	0–7						
46	92	0–7	737–752	—				
	93	0–7						

Address				Signal	Description	Activity / data type	Range	Factor
Relative			**Absolute**					
WORD	BYTE	BIT	BIT					
47	94	0–7	753–768	—				
	95	0–7						
48	96	0–7	769–784	—				
	97	0–7						
49	98	0–7	785–800	—				
	99	0–7						
50	100	0–7	801–816	Resistance	Group 2	UINT16	0 to +400 [mOhm]	10
	101	0–7						
51	102	0–7	817–832	Inductance	Group 2	UINT16	0 to +250 [micro-henries]	10
	103	0–7						

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 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 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

TAG Table for Input Signals

Address	TAG	Value
BIT 325	**Disable Gas settings:**	
TAG 30	MIG Gasvalue	
TAG 31	MIG Gasfactor	
TAG 32	—	
TAG 33	—	
TAG 34	—	
TAG 35	—	
TAG 36	—	
TAG 37	—	
TAG 38	—	
TAG 39	—	

Address	TAG	Value
BIT 326	**Disable components setup:**	
TAG 40	Cooling unit mode	See table **Value Range for Cooling unit mode** on page **38**
TAG 41	Delay time flow sensor	
TAG 42	Touch sensing sensitivity	
TAG 43	Ignition time out	
TAG 44	—	
TAG 45	—	
TAG 46	—	
TAG 47	—	
TAG 48	—	

Address	TAG	Value
BIT 326	**Disable components setup:**	
TAG 49	—	

Address	TAG	Value
BIT 327	**Disable language/units/ standards:**	
TAG 50	Language	See **Value Table** on page **38**
TAG 51	Unit (metric/imperial)	
TAG 52	Welding standard (AWS/EU)	
TAG 53	—	
TAG 54	—	
TAG 55	—	
TAG 56	—	
TAG 57	—	
TAG 58	—	
TAG 59	—	
TAG 60	Arc break filter time / arc loss error time	
TAG 61	Arc break monitoring reaction	

Value Range for Cooling unit mode

TAG 40	Description
1	eco
2	auto
3	on
4	off

Value Range for Cooling unit mode

Value Table

Address	Description	Value
Language:		
0	—	
1	English	
2	German	
3	Japanese	
4	Chinese	
5	Spanish	
6	French	
7	Czech	

Address	Description	Value
Language:		
8	Hungarian	
9	Italian	
10	Norwegian	
11	Polish	
12	Portuguese	
13	Slovakian	
14	Turkish	
15	Russian	
16	Swedish	
17	Estonian	
18	Finnish	
19	Lithuanian	
20	Latvian	
21	Dutch	
22	Slovenian	
23	Romanian	
24	Croatian	
25	Ukrainian	
26	Korean	
27	Icelandic	
28	Vietnamese	
29	Thai	
30	Indonesian	
31	Serbian	
32	Hindi	
33	Tamil	
34	Danish	
35	Bulgarian	

Address	Description	Value
Unit (imperial/metric):		
0	—	
1	Imperial	
2	Metric	

Address	Description	Value
Welding standard (AWS/EU):		
0	—	
1	AWS	

Address	Description	Value
Welding standard (AWS/EU):		
2	CEN	

TAG Table for Output Signals

Address	Description	Value
Welding-relevant values:		
TAG 10001	Welding voltage	
TAG 10002	Welding current	
TAG 10003	Wire feed speed	
TAG 10004	Real value power	
TAG 10005	Ignitiondistance	
TAG 10006	—	
TAG 10007	—	
TAG 10008	—	
TAG 10009	—	
TAG 10010	—	
TAG 10011	—	
TAG 10012	—	
TAG 10013	—	
TAG 10014	—	
TAG 10015	—	

Address	Description	Value
Welding system-relevant values:		
TAG 10100	Vd max. processline	
TAG 10101	Max. current weldingsystem	
TAG 10102	—	
TAG 10103	Safety status	
TAG 10104	—	
TAG 10105	—	
TAG 10106	—	
TAG 10107	—	
TAG 10108	—	
TAG 10109	—	
TAG 10110	—	
TAG 10111	—	

Address	Description	Value
Documentation-relevant values:		
TAG 10200	Welding time	
TAG 10201	Section time	
TAG 10202	—	

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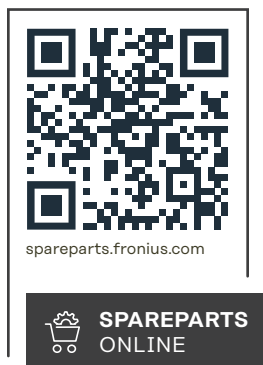
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