Operating Instructions

RI FB PRO/i AM Basic
RI MOD/i CC ProfiNet
RI MOD/i CC Ethernet/IP-2P
Config/i RI FB PRO AM BASIC

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Safety

Safety

> ⚠ **WARNING!**
>
> **Incorrect operation and incorrectly performed work can cause serious injury and property damage.**
> ▶ All the work and functions described in this document must only be carried out by trained and qualified personnel.
> ▶ All work and functions described in this document must only be performed once you have read and understood this document in full.
> ▶ Do not perform the work and functions described in this document until you have thoroughly read and understood all the documents for the system components, especially the safety rules.

Robot interface technical data

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).

ProfiNet technical data

Data Transfer Properties

Transfer technology: Ethernet	
Medium When selecting the cable, plug, and terminating resistors, the Profinet assembly guideline for the planning and installation of Profinet systems must be observed. The EMC tests were carried out by the manufacturer with the cable IEC-C5D-D4UGG0150A20A20-E. The EMC tests were carried out by the manufacturer with a bus cycle time of 32 ms.	
Transmission speed: 100 Mbit/s, full duplex mode	
Bus connection: Ethernet RJ45/SCRJ (fiber optic)	

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
Device ID	0320_{hex} (800_{dec}) Fronius ProfiNet 2-port
Vendor ID	$01B0_{hex}$ (432_{dec}) Fronius International GmbH
Station type	fronius-fb-pro-am-pn-2p

The following parameters provide detailed information about the bus module. The Profibus master can access the data using acyclic read/write services.

Parameters	Value
IM Manufacturer ID	$01B0_{hex}$ (432_{dec}) Fronius International GmbH
IM Order ID	4.044.016 (copper)/4.044.017 (fiber optic cable)
IM Revision Counter	0_{hex} (0_{dec})
IM Profile ID	0000_{hex} (0_{dec}) Non Profile Device
IM Profile Specific Type	0004_{hex} (4_{dec}) No profile
IM Version	0101_{hex} (257_{dec})
IM Supported	$000E_{hex}$ (14_{dec}) IM0-3 supported

Ethernet/IP-2P technical data

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.
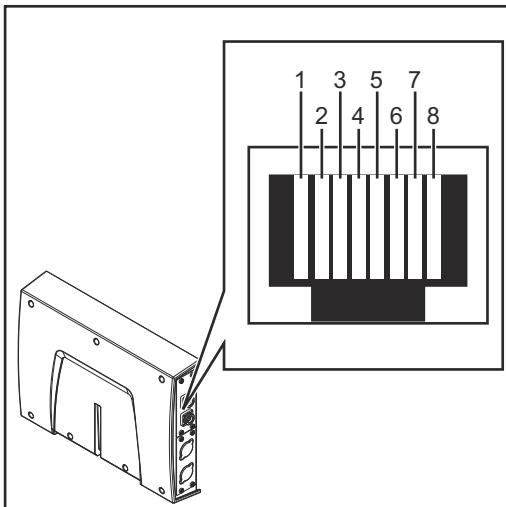
Parameter	Value
Vendor ID	534_{hex} (1332_{dec})
Device Type	C_{hex} (12_{dec})
Product Code	321_{hex} (801_{dec})

Image Type	Instance Type	Instance Name	Instance Description	Instance Number	Size [Byte]
Standard Image	Producing Instance	Input Data Standard	Data from welding machine to robot	100	40
	Consuming Instance	Output Data Standard	Data from robot to welding machine	150	40
Economy Image	Producing Instance	Input Data Standard	Data from welding machine to robot	101	16
	Consuming Instance	Output Data Standard	Data from robot to welding machine	151	16

Image Type	Instance Type	Instance Name	Instance Description	Instance Number	Size [Byte]
AM Basic 1.0 Image	Producing Instance	Input Data Standard	Data from welding machine to robot	103	60
	Consuming Instance	Output Data Standard	Data from robot to welding machine	153	60

Connections and indicators on the ProfiNet bus module
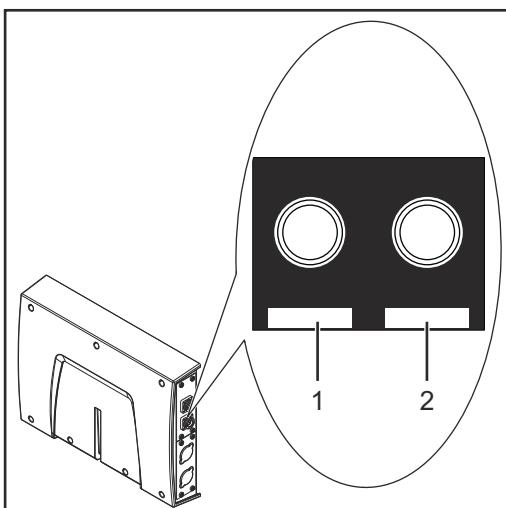
Connections and Indicators

RJ45 ProfiNet connection

Pin assignment RJ45 ProfiNet connection	
1	TD+
2	TD-
3	RD+
6	RD-
4,5,7,8	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).
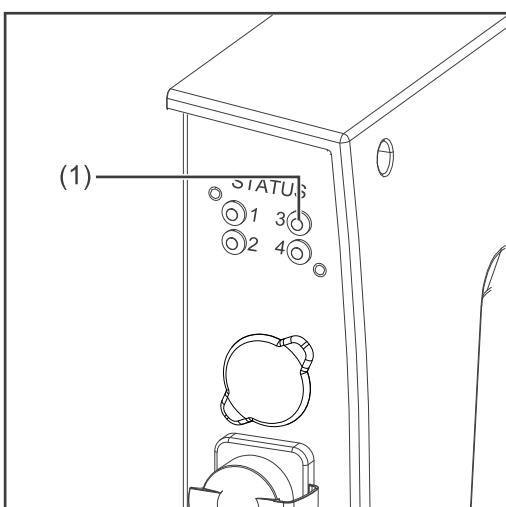
Fiber Optic (FO) connection

Pin assignment Fiber Optic (FO) connection	
1	Optical signal from the Anybus CompactCom module
2	Optical signal from the Anybus CompactCom module

LED MS - module status

(1) MS LED - module status
Off: No supply voltage/module in setup or initialization mode
Lights up green: Normal operation
Flashes green (once): Diagnosis process is running
Lights up red: Exception state, serious fault, etc.
Lights up green and red alternately Firmware update. Do not disconnect the module from the power supply during the update—this could result in damage to the module.
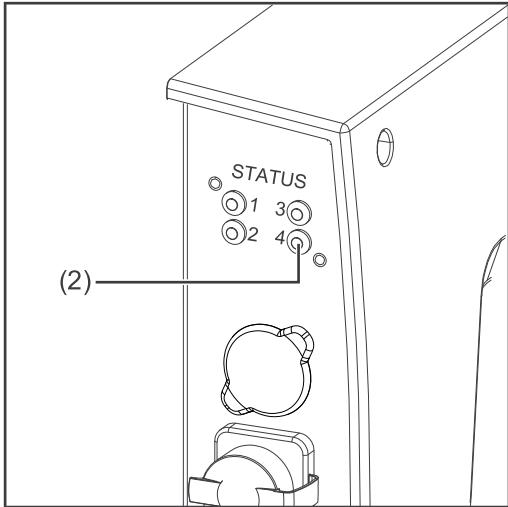
LED NS - network status

(2) NS LED - network status

Off:
Offline; no supply voltage or no connection with IO Controller

Lights up green:
Online (RUN); connection with IO Controller established, IO Controller in operation

Flashes green (once):
Online (STOP); connection with IO Controller established, IO Controller not in operation, IO data defective, IRT synchronization not ready

Flashes green (permanently):
In use by engineering tools in order to identify network node

Lights up red:
The module has identified a serious internal fault

Flashes red (once):
Station name not set
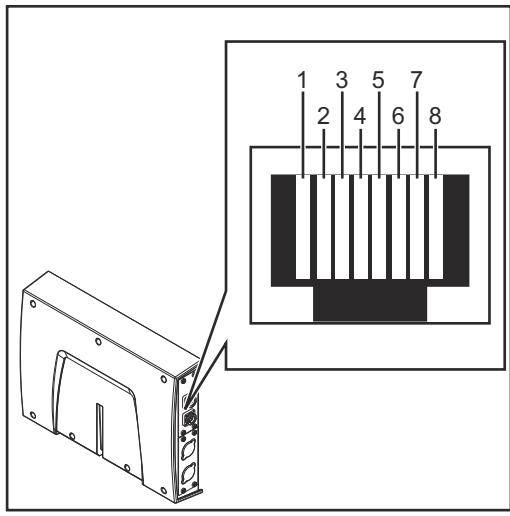
Flashes red (twice):
IP address not set

Flashes red (three times):
Configuration error; expected identification does not match the actual identification
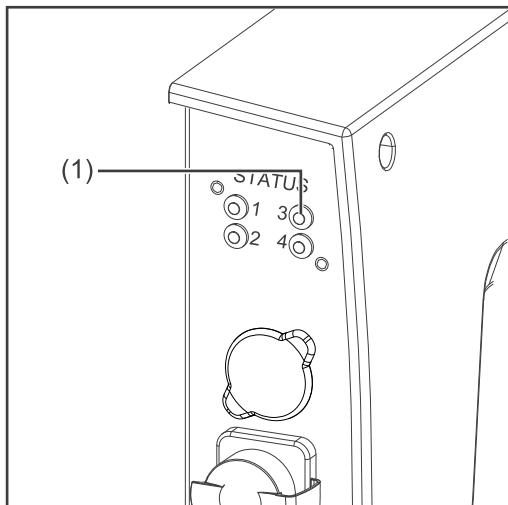
Connections and indicators on the Ethernet/ IP-2P bus module

Connections and Displays

RJ45 connection

| 1	TX+
2	TX-
3	RX+
6	RX-
4,5,7, 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).

(1) LED MS - Module status
Off: No supply voltage
Lights up green: Controlled by a master
Flashes green (once): Master not configured or master idle
Lights up red: Major error (exception state, serious fault, …)
Flashes red: Correctable error
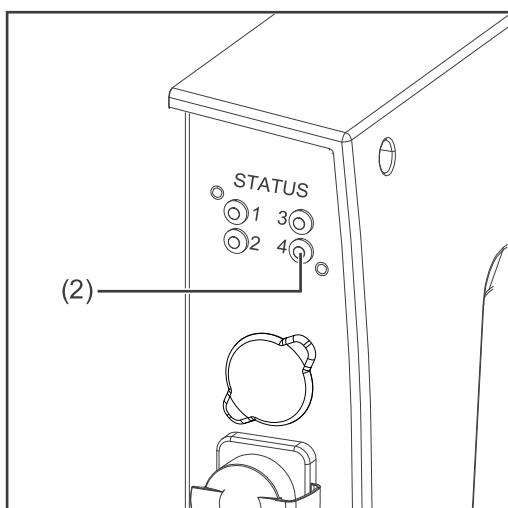
(2) LED NS - Network status
Off: No supply voltage or no IP address
Lights up green: Online, one or more connections established (CIP category 1 or 3)
Flashes green: Online, no connection established
Lights up red: Double IP address, serious error
Flashes red: Overrun of time for one or more connections (CIP category 1 or 3)
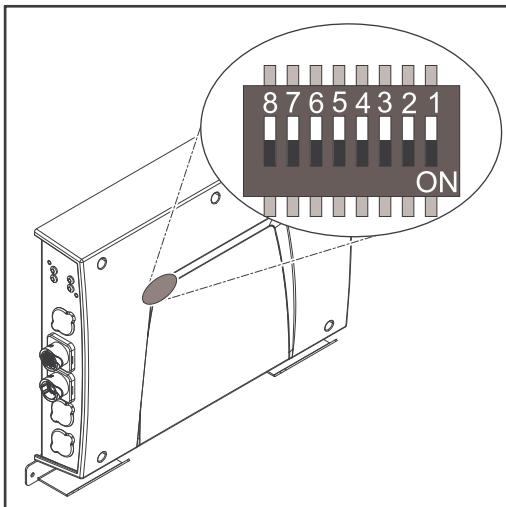
Configuring the ProfiNet bus module

Assignment of the Bus Module IP Address

In the case of ProfiNet, the assignment of the IP address, the subnet mask, and the default gateway is carried out by the master. A device name is also assigned to the interface by the master.
Therefore the IP address cannot be set via the DIP switch.
The communication takes place via the IP address assigned by the master.

Displaying the Bus Module IP Address

The IP address of the bus module assigned by the master can be viewed on the website of the welding machine. Proceed as follows in order to do this.

Note down the IP address of the welding machine source used:

1 On the welding machine control panel, select "Presets"

2 On the welding machine control panel, select "System"

3 On the welding machine control panel, select "Information"

4 Note down the displayed IP address (example: 10.5.72.13)

Access website of the welding machine in the internet browser:

5 Connect computer with the network of the welding machine

6 Enter the IP address of the welding machine in the search bar of the Internet browser and confirm

7 Enter standard user name (admin) and password (admin)
   - The website of the welding machine is displayed

Display IP address of the bus module:

8 On the welding machine website, select the "RI FB PRO/i" tab

9 The current IP address is displayed under the "Fieldbus configuration" point. For example: 192.168.0.12

Deleting IP Settings and Device Names

The two options listed below are available for the deletion of the IP settings and the device name.

Using the DIP switch:

1 Switch all positions on the DIP switch to OFF (position 1–6)

2 Restart interface
(disconnect power supply and then reconnect again)

On the welding machine website:

1 Select the "RI FB PRO/i" tab on the power source website

2 Under the "Module configuration/Module operations" point, select the "Set factory settings" field

3 Under the "Module configuration/Module operations" point, select "Restart field-bus module"
- The field-bus module is restarted and the IP settings are deleted

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Setting the process data width of the bus module

Note down the IP address of the welding machine used:

1 On the welding machine control panel, select "Defaults"

2 On the welding machine control panel, select "System"

3 On the welding machine control panel, select "Information"

4 Note down the displayed IP address (example: 10.5.72.13)

Open website of the welding machine in the internet browser:
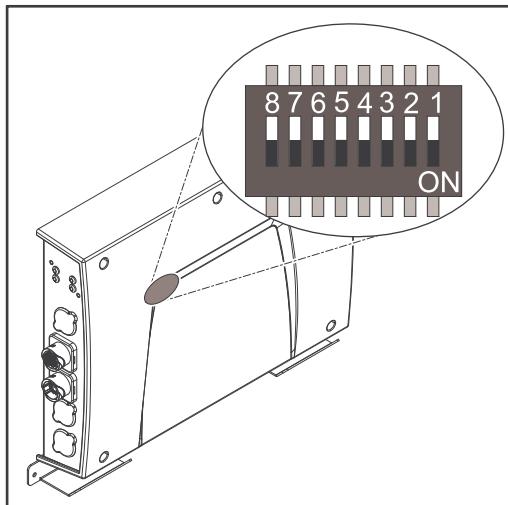
5 Connect the computer to the network of the welding machine

6 Enter the IP address of the welding machine in the search bar of the internet browser and confirm

7 Enter the standard user name (admin) and password (admin)
- The website of the welding machine is displayed

Set the process data width of the bus module:

8 On the welding machine website, select the "RI FB PRO/i" tab

9 Under "Process data", select the desired process data configuration

10 Select "Save"
- The field bus connection is restarted and the configuration is applied

Configuring the Ethernet/IP-2P bus module

Setting the Bus Module IP Address

You can set the bus module IP address as follows:

1. Using the DIP switch in the interface within the range defined by 192.168.0.xx
   (xx = DIP switch setting = 1 to 63)
   - All positions are set to the OFF position at the factory. In this case, the IP address must be set on the website of the welding machine
2. On the website of the welding machine (if all positions of the DIP switch are set to the OFF position)

The IP address is set using DIP switch positions 1 to 6. The configuration is carried out in binary format. This results in a configuration range of 1 to 63 in decimal format.

Example for setting the IP address of the bus module using the DIP switch in the interface:									
Dip switch									
8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**IP address**	
-	-	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	

Instructions for setting the IP address on the website of the welding machine:

Note down the IP address of the welding machine used:

1 On the welding machine control panel, select "Defaults"

2 On the welding machine control panel, select "System"

3 On the welding machine control panel, select "Information"

4 Note down the displayed IP address (example: 10.5.72.13)

Access website of the welding machine in the internet browser:

5 Connect the computer to the network of the welding machine

6 Enter the IP address of the welding machine in the search bar of the internet browser and confirm

7 Enter the standard user name (admin) and password (admin)
   - The website of the power source is displayed

Set the bus module IP address:

8 On the power welding machine, select the "RI FB PRO/i" tab

9 Enter the desired IP address for the interface under "Module configuration".
For example: 192.168.0.12

10 Select "Set configuration"

11 Select "Restart module"
- The set IP address is applied

Input signals

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 V2.0.0 of the RI FB PRO/i onwards.

Input signals (from robot to welding machine)

WORD	BYTE	Relative BIT	Absolute BIT	Signal	Activity / data type	Range	Factor	Standard	Economy
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 29			
		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 29			
		7	15	Processline selection Bit 1	High				

WORD	BYTE	BIT (Relative)	BIT (Absolute)	Signal	Activity / data type	Range	Factor	Standard	Economy
1	2	0	16	Welding Simulation	High			✓	✓
		1	17	Synchro pulse on	High				
		2	18	—					
		3	19	—					
		4	20	—					
		5	21	Booster manual	High				
		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				
		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 29		✓	✓
		1	33	TWIN mode Bit 1	High				
		2	34	—					
		3	35	—					
		4	36	—					
		5	37	Documentation mode	High	See table Value Range for Docu-mentation Mode on page 30			
		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 | |
WORD	BYTE	BIT	Absolute BIT					Standard	Economy
3	6	0	48	Command value selection Bit0	High			✓	✓
		1	49	Command value selection Bit1	High				
		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, 9	0-7	64-79	Welding characteristic- / Job number	UINT16	0 to 65,535 0 to 1000	1	✓	✓
5	10, 11	0-7	80-95	*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	SINT16	-327.68 to 327.67 [m/min]	100	✓	✓
				For job mode: Power correction	SINT16	-20.00 to 20.00 [%]	100		

WORD	BYTE	BIT	BIT (Absolute)	Signal	Activity / data type	Range	Factor	Standard	Economy
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 29		✓	
	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						

WORD	BYTE	BIT	BIT (Absolute)	Signal	Activity / data type	Range	Factor	Standard	Economy
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 65,535 [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						
20	40	0-7	320	CTWD Delta Mean calc on	High			✓	
			321	—					
			322	—					
			323	—					
			324	—					
			325	—					
			326	—					
			327	—					
20	41	0-7	328-335	—					
21	42	0-7	336-343	—					
21	43	0-7	344-351	—					
22	44	0-7	352-367	Set CTWD	UINT16	0 to 65,535 [mm]	1	✓	
	45	0-7							
23	46	0-7	368-383	Additive Power Correction	SINT16	-3276.8 to 3276.7	10	✓	
	47	0-7							
24	48	0-7	384-399	Deposition Stabilizer Limit	UINT16	0 to 655.35 [m/min]	100	✓	
	49	0-7							
25	50	0-7	400-415	Deposition Stabilizer Dynamic	UINT16	0 to 6553.5	10	✓	
	51	0-7							

Address				Signal	Activity / data type	Range	Factor	Process image	
Relative			Abso-lute					Standard	Economy
WORD	BYTE	BIT	BIT						
26	52	0-7	416-431	—					
	53	0-7							
27	54	0-7	432-447	—					
	55	0-7							
28	56	0-7	448-463	—					
	57	0-7							
29	58	0-7	464-479	—					
	59	0-7							

Output signals

Availability of the output signals The output signals listed below are available from firmware V2.0.0 of the RI FB PRO/i onwards.

Output signals (from welding machine 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 | |
WORD	BYTE	BIT	BIT (Abso-lute)					Standard	Economy
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	Standby active	High				
		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 30			
		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	Functions Status Bit 0	High	See table Value range for Functions on page 31		✓	✓
		1	33	Functions Status Bit 1	High				
		2	34	—					
		3	35	Safety status Bit 0	High	See table Value range Safety status on page 30			
		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	Process run	High				
		5	45	—					
		6	46	Active process line bit 0	High				
		7	47	Active process line bit 1	High				

WORD	BYTE	BIT	Absolute BIT	Signal	Activity / data type	Range	Factor	Standard	Economy
3	6	0	48	Process Bit 0	High	See table Value Range for Process Bit on page 30		✓	✓
		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	10,000	✓	✓
	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						

Address				Signal	Activity / data type	Range	Factor	Process image	
Relative			Absolute					Standard	Economy
WORD	BYTE	BIT	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	208-223	Actual real value for AVC				✓	
	27	0-7							
14	28	0-7	224-239	Reserve				✓	
	29	0-7							
15	30	0-7	240-255	Resistance	UINT16	0.0 to +400.0 [mOhm]	10	✓	
	31	0-7							
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	272-287	Wire buffer level	SINT16	-100 to 100 [%]	1	✓	
	35	0-7							
18	36	0-7	288-303	Reserve				✓	
	37	0-7							
19	38	0-7	304-319	Reserve				✓	
	39	0-7							
20	40	0-7	320-335	—					
	41	0-7							
21	42	0-7	336-343	—					
	43		344-351						
22	44	0-7	352-367	Power	UINT16	0 to 655.35 [kW]	100	✓	
	45								
23	46	0-7	368-383	Delta CTWD	SINT16	-327.68 to 327.67 [mm]	100	✓	
	47								
24	48	0-7	384-399	Mean Delta CTWD	SINT16	-327.68 to 327.67 [mm]	100	✓	
	49								
25	50	0-7	400-415	—					
	51								
26	52	0-7	416-431	—					
	53								

Address				Signal	Activity / data type	Range	Factor	Process image	
Relative			Abso-lute					Standard	Economy
WORD	BYTE	BIT	BIT						
27	54 55	0-7	432-447	—					
28	56 57	0-7	448-463	—					
29	58 59	0-7	464-479	—					

Value ranges

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	2-step MIG/MAG standard manual
1	0	0	0	0	Idle Mode
1	0	0	0	1	Stop coolant pump
1	1	0	0	1	R/L-Measurement

Value range for operating 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

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

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)

Assignment of sensor statuses

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 Safety 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
0	1	0	1	0	ColdWire
0	1	0	1	1	DynamicWire

Value Range for Process Bit

Value Range for Documentation Mode

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

Value range for documentation mode

Value range for Functions

000	Inaktiv
001	Idle
010	Finished
011	Error
100	Reserve
101	Reserve
110	Reserve
111	Reserve

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