

ROBOTICS

Application manual

KEMPPI A7 MIG Welder 350/450



Trace back information: Workspace Main version a483 Checked in 2022-11-16 Skribenta version 5.5.019

Application manual KEMPPI A7 MIG Welder 350/450

RobotWare 6.14

Document ID: 3HAC086375-001 Revision: A

© Copyright 2022 ABB. All rights reserved. Specifications subject to change without notice.

The information in this manual is subject to change without notice and should not be construed as a commitment by ABB. ABB assumes no responsibility for any errors that may appear in this manual.

Except as may be expressly stated anywhere in this manual, nothing herein shall be construed as any kind of guarantee or warranty by ABB for losses, damage to persons or property, fitness for a specific purpose or the like.

In no event shall ABB be liable for incidental or consequential damages arising from use of this manual and products described herein.

This manual and parts thereof must not be reproduced or copied without ABB's written permission.

Keep for future reference.

Additional copies of this manual may be obtained from ABB.

Original instructions.

© Copyright 2022 ABB. All rights reserved. Specifications subject to change without notice.

Table of contents

| | Over | view of this manual | 7 | | | | |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--|--|--|--|
| 1 | Introd | duction to Kemppi A7 interface | 9 | | | | |
| 2 | Insta | llation | 11 | | | | |
| | 2.1 2.2 2.3 2.4 | Introduction Hardware setup A7 general robot settings Software setup | 11 12 17 18 | | | | |
| 3 | Overview of this manual Introduction to Kemppi A7 interface Installation 2.1 2.1 Introduction 2.2 Hardware setup 2.3 A7 general robot settings 2.4 Software setup 2.5 Software setup Fieldbus configuration 3.1 3.1 Introduction 3.2 EtherNet/IP configuration 3.2.1 Installation 3.2.2 Kemppi A7 settings 3.2.3 Changing the IRC5 communication settings 3.2.4 Accessing the welder's service port from IRC5 controller 3.3 DeviceNet configuration 3.4 PROFINET configuration 3.5 Weld Editor Interface 6.1 Introduction 6.2 Weld Editor in online control mode 6.3 Weld Editor in Memory Channel mode 6.4 Tuning of weld parameters 6.5 How to edit welddata using the partdata concept< | | | | | | |
| | 3.1 3.2 3.3 3.4 | Introduction EtherNet/IP configuration 3.2.1 Installation 3.2.2 Kemppi A7 settings 3.2.3 Changing the IRC5 communication settings 3.2.4 Accessing the welder's service port from IRC5 controller DeviceNet configuration PROFINET configuration | 21 22 23 25 27 28 30 | | | | |
| 4 | Watc | hdog functionality | 35 | | | | |
| 5 | 4 Watchdog functionality 5 Kemppi Interface Modes | | | | | | |
| 6 | Weld | Editor Interface | 39 | | | | |
| | 6.1 6.2 6.3 6.4 6.5 | Introduction | 39 42 48 53 54 | | | | |
| 7 | Syste | em parameters | 59 | | | | |
| 8 | Seam | n Tracking with A7 MIG Welder 350/450 | 63 | | | | |
| | 8.1 8.2 8.3 8.4 8.5 8.6 8.7 8.8 | Introduction Installation Software installation 8.3.1 KEMPPI A7 Tracking Feedback Signal 8.3.2 System parameters Seam tracking Tracking parameters Best practice Runtime widget Weave and track data editor interface | 63 64 66 67 69 73 77 78 81 82 | | | | |
| 9 | The k | 4 PROFINET configuration 34 'atchdog functionality 35 'atchdog functionality 35 'atchdog functionality 35 emppi Interface Modes 37 'eld Editor Interface 36 1 Introduction 36 2 Weld Editor in online control mode 42 3 Weld Editor in Memory Channel mode 42 4 Tuning of weld parameters 55 5 How to edit welddata using the partdata concept 54 /stem parameters 55 eam Tracking with A7 MIG Welder 350/450 63 1 Introduction 63 2 Installation 64 3 Software installation 64 3 Software installation 66 8 8.3.1 KEMPPI A7 Tracking Feedback Signal 67 8 8.3.2 System parameters 77 5 Tracking parameters 72 5 Tracking parameters 72 6 8.3.2 System parameters 77 7 Best | | | | | |
| 10 | 3.4 PROFINE L configuration 4 Watchdog functionality 5 Kemppi Interface Modes 6 Weld Editor Interface 6.1 Introduction 6.2 Weld Editor in online control mode 6.3 Weld Editor in Memory Channel mode 6.4 Tuning of weld parameters 6.5 How to edit welddata using the partdata concept 7 System parameters 8 Seam Tracking with A7 MIG Welder 350/450 8.1 Introduction 8.2 Installation 8.3.1 KEMPPI A7 Tracking Feedback Signal 8.3.2 System parameters 8.4 Seam tracking 8.5 Tracking parameters 8.6 Best practice 8.7 Runtime widget 8.8 Weave and track data editor interface 9 The Kemppi A7 Logbook Viewer 10 Customize widgets 10.1 Production Screen widgets on the FlexPendant 10.2 Modifying the widgets on the FlexPendant | | | | | | |
| | 10.1 10.2 | Production Screen widgets Modifying the widgets on the FlexPendant | 89 93 | | | | |
| Inc | lex | | 95 | | | | |

This page is intentionally left blank

Overview of this manual

About this manual

This manual describes the options Kemppi A7 Interface and Weld Editor and contains instructions to configure it.



Note

It is the responsibility of the integrator to provide safety and user guides for the robot system.

This manual should be read before installing and commissioning of a Robotic Arc Welding system with a Kemppi A7 power source.

Prerequisites

The reader should have the required knowledge of:

- Mechanical installation work •
- be familiar with the RAPID programming language •
- be familiar with system parameters and how to configure them ٠



Note

Before any work on or with the robot is performed, the safety information in the product manual for the controller and manipulator must be read.

References

| References | Document ID |
|---------------------------------------------------------------------------|----------------|
| Operating manual - IRC5 with FlexPendant | 3HAC050941-001 |
| Operating manual - RobotStudio | 3HAC032104-001 |
| Operating manual - Seam tracking with Weldguide III and MultiPass | 3HEA802921-001 |
| Technical reference manual - RAPID Instructions, Functions and Data types | 3HAC050917-001 |
| Technical reference manual - RAPID Overview | 3HAC050947-001 |
| Technical reference manual - System parameters | 3HAC050948-001 |
| Application manual - Arc and Arc Sensor | 3HAC050988-001 |
| Application manual - Controller software IRC5 | 3HAC050798-001 |
| Application manual - MultiMove | 3HAC050961-001 |
| Application manual - Production Screen | 3HAC050964-001 |

Revisions

| Revision | Description |
|----------|--------------------------------|
| Α | Published with RobotWare 6.14. |

This page is intentionally left blank

1 Introduction to Kemppi A7 interface

About Kemppi A7 MIG Welder interface

This manual describes the ABB Robotics IRC5 interface for:

A7 MIG Welder 350/450

Requirements

The power source must meet the following requirements:

- A7 MIG Welder Robot Interface Firmware >= 1.05.00.0
- A7 MIG Welder Firmware >= 1.04.00.0 OR, if S/N, >= 3018192 Firmware 2.01
- Fieldbus Interface for DeviceNet/ProfiNet or EtherNet/IP

Overview

The A7 MIG Welder power sources are based on top of the class inverter technology. They belong to the high-end system class of Kemppi products. There is a wide range of processes for you to choose the one that suits your application:

- MIG, 1-MIG
- Pulse, Double Pulse
- Brazing
- Cladding
- WiseRoot+
- WiseThin+
- WiseFusion
- WisePenetration

The system can be configured to contain an optimal choice of just the right welding programs for the application. There are welding programs available for all the common filler wire and shielding gas combinations for mild steel, stainless steel and aluminum.



This page is intentionally left blank

2 Installation

2.1 Introduction

| Robot controller so | ftware |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Robot prerequisites: |
| | IRC5 robot controller with main computer DSQC1000 or later |
| | RobotWare version 6.14 or later with the following options: |
| | [633-4] RobotWare Arc |
| | - [637-1] Production Screen |
| | One of the following industrial networks: |
| | [709-1] DeviceNet Master/Slave |
| | - [841-1] EtherNet/IP Scanner/Adapter |
| | - [888-2] PROFINET Controller/Device |
| | The following option is recommended in order to use the <i>Partdata</i> concept within the welddata editor: |
| | - [812-1] Production Manager |
| RobotStudio | |
| | RobotStudio software: |
| | RobotStudio version 2022 or later |
| Limitations | |
| | Currently only the first arc system is supported with this interface. If more than one welder is connected per robot, the arc sub-option <i>Standard I/O Welder</i> is required. |
| | Tuning of weld speed and weld parameters is no longer supported by RobotWare Arc GUI. |
| Kemppi A7 add-in | |
| | The Kemppi A7 add-in consists of the following software components: |
| | Ready to weld interface to control a Kemppi A7 350/450 welder |
| | Logbook Viewer as RobotStudio add-in to download the logbook entries from any welder connected to a network |
| | Graphical weld data editor |
| | Graphical weave and track data editor |
| | Graphical application for manual functions such as |
| | Process blocking |
| | - Wire feed (forward/backward) |
| | - Purge gas |
| | Graphical widget displaying run-time data |
| | |

2.2 Hardware setup

2.2 Hardware setup

| Introduction | |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | The ABB preferred connection to the welder is to connect the LAN port of the welder to LAN2 or WAN on the IRC5 controller. However, this is not mandatory but it is a convenient way to set up the system it gives access to the welder and the robot controller from RobotStudio. |
| | This connection is only used with the RobotStudio add-in to download the logbook entries. Furthermore, it is possible to get access to the welders Web UI from RobotStudio by launching a web browser. |
| | The I/O based communication to the welder which is needed to control the welder is done via a fieldbus interface and not through the LAN port on the welder. |
| | A switch must be added if the system is a MultiMove system or if the LAN port is connected to a different network. |
| | It is recommended that switches used in the I/O network support <i>Quality of Service</i> (QoS). I/O devices mark their packets with a priority value. The priority value is used in order to get better I/O data throughput and shorter delays on the network. |
| | Switches and routers are then able to differentiate the I/O devices critical from the other non-critical traffic. To do this, the switches and routers must support Quality of Service. |

2.2 Hardware setup Continued

Intended use of WAN and LAN ports

The WAN port is a public network interface to the controller, typically connected to the factory network with a public IP address provided by the network administrator.

The LAN ports are intended for connecting network-based process equipment to the controller, for example, industrial networks, cameras, and welding equipment. LAN 2 can only be used as a private network to the IRC5 controller.



2.2 Hardware setup *Continued*

Connecting to the IRC5 controller

Connect an Ethernet cable between the robot controller LAN2 port and the Kemppi A7 welder Ethernet port. The following illustration shows an overview of the computer unit.



xx1300000608

| X4 | LAN2 |
|----|------|
| X5 | LAN3 |

Welder LAN port

The LAN port (service port) is located on the back of the robot interface unit on the welder. If connecting the welder to the IRC5 controller, make sure to use a static IP address and turn of DHCP.

Additional information of the robot interface unit can be found in the *Operator Manual* and the *Integration Guide* of the welder.

14

2 Installation

2.2 Hardware setup Continued



LAN connection to the left, Fieldbus connection to the right.

2.2 Hardware setup *Continued*

IP address of welder

The web user interface starts up automatically when the power is turned on. However, the network settings must be configured from the setup panel before access is possible to the Web UI from the computer connected to the web user interface server.

Go to the **Main menu** > **Robot** > **Network settings**, and configure the *DHCP enabled*, *IP address*, *Subnet mask*, and *Gateway* parameters to fit the network environment.

| 🕫 КЕМРРІ | CHANNEL INFO F1 F2 F3 | A7 MIG |
|----------|-----------------------------|--------|

xx2200001854

To access the web interface, start a browser and enter the IP address.

Additional information can be found in the *Operator Manual* and the *Integration Guide* of the welder.

2.3 A7 general robot settings

2.3 A7 general robot settings

A7 power source

The following settings need to be set in the A7 power source to work with the robot interface. The settings can be found using the web UI. Select **Welding System** and browse to **General Robot Settings**.

| GEI | GENERAL ROBOT SETTINGS | | | | | | | | |
|-----|-------------------------|----|---------------|----|-----------------|---|--|--|--|
| ф | INTERFACE MODE | 15 | 1 - 99 | | | | | | |
| ф | INTERFACE BYTE ORDER | | LITTLE-ENDIAN | | BIG-ENDIAN | | | | |
| ۷ | VOLTAGE SCALING | | | | | 0 | | | |
| | WIRE FEED SPEED SCALING | | | | | 0 | | | |
| A | CURRENT SCALING | | | | | 0 | | | |
| ¢ | SIMULATION MODE | | OFF | ON | SELECT AT ROBOT | | | | |

2.4 Software setup

2.4 Software setup

Download Kemppi A7 package

In RobotStudio, download the Kemppi A7 Package from the Add-Ins tab (common tags: RobotWare-Addin) and install it.

Build the robot system

- 1 Start Installation Manager and build the robot system.
- 2 In the **Products** tab, add the **KemppiA7** product. No license is required for the package.

| Controllers | Added Product(s) | | | | | | | |
|--------------|------------------|-----------------------|-----------|-----------|-----------|---------------|---------------|--|
| | Name | Version | Publisher | Туре | Status | Creation Date | Install Order | |
| Products | RobotWare | 6.14.00.00 RC2 | ABB | RobotWare | Installed | 25.08.2022 | 1 | |
| Licenses | - Positioner | 6.13.03.00 | ABB | Addin | Installed | 20.05.2022 | 2 | |
| Options | 👻 KemppiA7 | 1.00.0000 13.Internal | ABB | AddIn | Installed | 29.08.2022 | 3 | |
| Confirmation | | | | | | | | |
| xx2200001856 | | | | | | | | |

3 In the **Drive Modules** tab, select **RW Add-In loaded Welder** for each associated welding robot.



4 For each welding robot, select the option **Install Power Supply** and select the fieldbus.

2.4 Software setup Continued

5 If the system has the SmarTac option, select **Include SmarTac Config**. This will load configuration files to use the Kemppi touch sense function.



- 6 If Seamtracking (TAST) is desired, select **Install SeamTracking Option**. This requires controller the option *Tracking Interface*.
- 7 If recording and replaying welding paths is desired, select **Install Multipass** instructions.
- 8 Apply the settings and download the system to the controller.

RobotWare functionality

The generic RAPID objects are described in *Technical reference manual - RAPID Instructions, Functions and Data types*. All documents are listed in *References on page 7*.

trackdata

The data type trackdata and other arc-specific RAPID objects are described in *Application manual - Arc and Arc Sensor*.

This page is intentionally left blank

3 Fieldbus configuration

3.1 Introduction

Introduction

The Kemppi A7 Add-In package is delivered with pre-configured fieldbus configuration files for PROFINET, Ethernet/IP, and DeviceNet.



All I/O signals are pre-configured as defined in the *A7 Integration Guide* based on *I/O table 15*. Additional information can be found in the *Operator Manual* and *Integration Guide* provided by Kemppi.

Default I/O board address

| Fieldbus | Network | Default I/O board address |
|-------------|-----------|------------------------------------|
| DeviceNet | N/A | Robot 1 -DN_Address 40 |
| | | Robot 2 -DN_Address 41 |
| | | Robot 3 -DN_Address 42 |
| | | Robot 4 -DN_Address 43 |
| EtherNet/IP | LAN2 (X4) | Robot 1 -IP_Address 192.168.125.60 |
| | | Robot 2 -IP_Address 192.168.125.61 |
| | | Robot 3 -IP_Address 192.168.125.62 |
| | | Robot 4 -IP_Address 192.168.125.63 |
| ProfiNet | LAN3 (X5) | Robot 1 -IP_Address 192.168.0.2 |
| | | Robot 2 -IP_Address 192.168.0.3 |
| | | Robot 3 -IP_Address 192.168.0.4 |
| | | Robot 4 -IP_Address 192.168.0.5 |

3.2.1 Installation

3.2 EtherNet/IP configuration

3.2.1 Installation

Software prerequisites

Robot prerequisites:

- IRC5 robot controller with main computer DSQC1000 or later
- RobotWare version 6.14 or higher with one of the following Arc sub-options (power source interface):
 - Standard I/O Welder
 - Kemppi A7 Product add-in
- RobotStudio version 2022 or later

Hardware prerequisites

Required:

• 1 Ethernet cable

Optional:

- 1 Ethernet switch/hub
- 2 Ethernet cables

Software installation

Download the Kemppi A7 Package and install it. Build the robot system. See *Software setup on page 18*.

All parameters for the EtherNet/IP based communication will be automatically installed with the IP address mentioned earlier.

Make sure the Ethernet cable/switch is connected to LAN2.

3.2.2 Kemppi A7 settings

3.2.2 Kemppi A7 settings

Changing the A7 network settings for web UI

Change the IP settings as described in section *IP address of welder on page 16*, to be able to access the welder using the web UI.

Changing the A7 network settings for the IRC5 communication

Follow these steps to change the network settings for IRC5 communication:

1 Connect to the service port on the robot interface unit with the Ethernet cable connected to your PC (LAN connection to the left).



xx2200001853

- 2 From a web browser address bar, enter the defined IP address.
- 3 In the Kemppi web UI browser, browse to **Settings** and select **Fieldbus**. The configuration parameters can be modified here.

3 Fieldbus configuration

3.2.2 Kemppi A7 settings *Continued*

Fieldbus settings in web UI

| FIELDBUS SETTINGS: ETHERNET/IP 2-PORT | | | | | | | | |
|---------------------------------------|---------------------|--------|-------|--|-----|--|----|----|
| IDENTIFICATION INFORMATION | | | | | | | | |
| ODVA VENDOR ID | ODVA VENDOR ID 1403 | | | | | | | |
| ODVA DEVICE TYPE | 100 | | | | | | | |
| PRODUCT CODE | 1 | | | | | | | |
| VERSION | 0.0 | | | | | | | |
| SERIAL NUMBER | 750176 | 5705 | | | | | | |
| PRODUCT NAME | A7 MIG | 5 Wel | der | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| ADAPTER INFORMATION | | | | | | | | |
| MAC ADDRESS | 00:30:1 | 11:2A: | 08:DC | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| CONFIGURATION PARAMETERS | | | | | | | | |
| | | | | | | | | |
| DHCP | | | OFF | | | | | ON |
| | | | | | | | | |
| IP ADDRESS | 107 | | 169 | | 105 | | 60 | |
| | 192 | | 100 | | 125 | | 00 | |
| | | | | | | | | |
| SUBNET MASK | 255 | | 255 | | 255 | | 0 | |
| | | | | | | | | |
| | | | | | | | | |
| GATEWAY | 192 | | 168 | | 125 | | 60 | |
| | | | | | | | | |

3.2.3 Changing the IRC5 communication settings

3.2.3 Changing the IRC5 communication settings

IRC5 EtherNet/IP device

Use the following procedure to configure the communication between the IRC5 controller and the A7 welder.

- 1 In RobotStudio, double-click the system name.
- 2 In the Controller panel, expand Configuration and select I/O System.
- 3 In the **Configuration I/O System** panel, select **EtherNet/IP Device** and select the Kemppi A7 power supply to be configured (*ioKemppiWld1*).



4 In the **Instance Editor**, enter the IP address to use for the EtherNet/IP Device *ioKemppiWld1* (welder connected to robot 1) and click **OK**.

| Instance Editor | | | | \times |
|-----------------------------------------------------------------------------|--------------------------------------------|------------------------------------------------------------|---------|----------|
| Name | Value | Information | | |
| Name | ioKemppiWld1 | | | ^ |
| Connected to Industrial Network | EtherNetIP | | | |
| State when System Startup | Activated ~ | | | |
| Trust Level | DefaultTrustLevel ~ | | | |
| Simulated | ○ Yes ● No | | | |
| Vendor Name | Kemppi Oy | | | |
| Product Name | A7 MIG Welder | | | |
| Recovery Time (ms) | 5000 | | | |
| Identification Label | A7 MIG Welder - Exclusive Owner | | | |
| Address | 192.168.178.60 | | | |
| Vendor ID | 1403 | | | |
| Device Type | 100 | | | |
| Product Code | 1 | | | |
| Quick Connect | Not Used Y | | | |
| Output Assembly | 150 | | | |
| Input Assembly | 100 | | | |
| Output Size (bytes) | 16 | | | |
| Input Size (bytes) | 16 | | | |
| Configuration Assembly | 5 | | | |
| Ownership | Exclusive ~ | | | |
| Input Connection Type | Multicast ~ | | | |
| Connection Priority Value (RAPID) The changes will not take effect of | Schedule v | | | ~ |
| Minimum number of characters i | s <invalid>. Maximum number of c</invalid> | haracters is <in< td=""><td>valid>.</td><td></td></in<> | valid>. | |
| | | ОК | Ca | ncel |

xx2200001861

IRC5 IP settings

Use the following procedure to configure the communication between the IRC5 controller and the Kemppi A7 welder.

1 In RobotStudio, double-click the system name.

3.2.3 Changing the IRC5 communication settings *Continued*

- 2 In the Controller panel, expand Configuration and select Communication.
- 3 In the Configuration Communication panel, select IP Setting.

| ☆ Collapse all | Configuration - Communi | cation × | | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------|---------------|-----------|-------------|--|
| Current Station | Туре | IP | Subnet | Interface | Label | |
| ▲ 📳 1Kemppi | Application protocol | 192.168.178.1 | 255.255.255.0 | LAN3 | EtherNet/IP | |
| Image: | Connected Services | | | | | |
| A mail Configuration | DNS Client | | | | | |
| | Ethernet Port | | | | | |
| Controller | IP Route | | | | | |
| I/O System | IP Setting | | | | | |
| Map-Machine Communication | Serial Port | | | | | |
| Matien | Static VLAN | | | | | |
| Motion | Transmission Protocol | | | | | |
| Process | | | | | | |

- 4 In the Instance Editor, enter the IP address to use for the EtherNet/IP master and click OK.
- 5 Change Interface to LAN3 (isolated network) and restart the controller

| 🐌 Instai | nce Editor | | | | | × |
|----------------------------------------|------------------------------------|--------------------------------------|------------------------------------------------------------|-----------------------------------------------------|--------|---|
| Name | Value | Information | | | | |
| IP | 192.168.178.1 | | | | | |
| Subnet | 255.255.255.0 | | | | | |
| Interface | LAN3 ~ | | | | | |
| Label | EtherNet/IP | | | | | |
| | | | | | | |
| Value (s | tring) | - first until 1 | | | | |
| Value (s The chan Minimum | tring) ges will not takk | e effect until ti racters is ≺inv | ontroller is restarted. >, Maximum number of characters | is <inva< td=""><td>ılid>.</td><td></td></inva<> | ılid>. | |

3.2.4 Accessing the welder's service port from IRC5 controller



Use the following procedure to access the web UI from the IRC5 service port.

- 1 Define the Kemppi network settings (192.168.125.165), see *Changing the A7 network settings for the IRC5 communication on page 23*. This will set the service port of the power supply to the IRC5 private network.
- 2 Connect the X4 Lan 2 to an Ethernet switch, see *Hardware prerequisites on* page 22.
- 3 Connect the Kemppi A7 Ethernet IP and service port to the Ethernet switch/hub.

3 Fieldbus configuration

3.3 DeviceNet configuration

3.3 DeviceNet configuration

Introduction

The DeviceNet network for IRC5 is running on a single channel PCI Express board in the IRC5 main computer. The DeviceNet board, DSQC1006, requires the main computer DSQC1000. With option *DeviceNet Master/Slave*, the IRC5 controller can act as a master, slave, or both, on the DeviceNet network.

Connections

The I/O network is connected to the DeviceNet PCI Express board, DSQC1006, on the main computer. The DeviceNet PCI Express board is a single channel board that can act both as a master and a slave simultaneously on the DeviceNet network. The following figure illustrates the location of the PCI Express board in the main computer unit.



3.3 DeviceNet configuration Continued

Termination resistors

Each end of the DeviceNet network must be terminated with a 121 ohm resistor. The two terminating resistors should be as far apart as possible. The technical specification of the termination resistor is: 121 ohm, 1 %, 0.25 W metal film resistor The termination resistor is placed in the cable connector. There is no internal termination on the DeviceNet PCI Express board.



xx0400000674

The following illustration shows an example of how to terminate the DeviceNet network.



| А | DeviceNet PCI Express board |
|---|-----------------------------|
| в | Termination resistor |
| С | I/O device |

3 Fieldbus configuration

3.4 **PROFINET** configuration

3.4 **PROFINET** configuration

Introduction The PROFINET network is running on the IRC5 main computer and does not require any additional hardware. PROFINET as described in this manual requires the main computer DSQC1000. Option PROFINET Controller/Device is required. Default gateway There are multiple default gateways in the system. Hence, it is possible to have two different default gateways in the system. Hence, it is possible to have two different default gateways in the system.

two different default gateways in the system. Hence, it is possible to have two different default gateways in the system, one for the non-PROFINET traffic and one that only manages the PROFINET interface and its traffic. So, while using option *PROFINET Controller/Device*, the LAN3 port is used only for PROFINET traffic.

Connections

The I/O network can be connected to one of the the Ethernet ports WAN, LAN 2, or LAN 3 on the main computer. The following figure illustrates where the Ethernet port connectors, are placed on the main computer.



xx1300000608

| X4 | LAN2 |
|----|------|
| X5 | LAN3 |

30

3.4 PROFINET configuration Continued

The pre-defined configuration that is installed when selecting the PROFINET fieldbus for the welder assumes that LAN3 is used as an isolated network for the PROFINET communication.



xx2200001865

Connect the Ethernet Cable to LAN3 or to a switch connected to LAN3.

The PROFINET configuration is created with the I/O Engineering Tool in RobotStudio, and can be found in HOME:/Arc/Kemppi_A7/PNET along with the used GSDML file.

To change the IP address and station name, if needed, use the I/O Engineering Tool. It is recommended to use the tool in offline mode (not connected to a robot controller) to avoid a slotted device configuration which will not work with the predefined I/O.

3 Fieldbus configuration

3.4 PROFINET configuration *Continued*

Device properties

The following graphic shows the predefined configuration for PROFINET device *ioKemppiWld1*.

| VO Project * Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Configuration Con | ose Device Catalogue Proper | ties | ÷ x |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------------------|-----|
| Search X | Search | | × |
| 4 Kempni A7 New joenri - Controller - | Profinet Configuration | | ~ |
| ⊿ ﷺI/O System | StationName | iokemppiwld1 | |
| PROFINET | Reduction Ratio | 2 | v |
| ▲ Controller | Faulty Telegrams | 24 | |
| ▷ , ioKemppiWld2 | Network | | |
| ▷ 🕎 ioKemppiWld3 | IP Adress | 192 . 168 . 0 . | 2 |
| ⊳ 📲ioKemppiWld4 | Subnet | 255 . 255 . 255 . | 0 |
| | Gateway | 192 168 0 | 1 |
| | Name | ioKemppiWld1 | |
| | ✓ Information | | |
| | Input Size | 16 | |
| | Output Size | 16 | |
| | Startup Mode | Legacy | |
| | Vendor Name | Kemppi Oy | |
| | Device Family | A7 MIG Welder | |
| | Device Type | General | |
| | Product Name | RT Migration | |
| | Order Number | 9774121PRN | |
| | Hardware Version | | |
| | Software Version | | |
| | Description | Kemppi A7 MIG Welder | |
| | Vendor Id | 872 | |
| | Device Id | 1 | |
| | GSD file | GSDML-V2.3-KEMPPI-9774121PRN-20160826 xml | |
| | 000 110 | GOURT VEOTEMITTO//TELETINE20100020.Alli | |

3.4 PROFINET configuration Continued

I/O slot configuration

The I/O device uses 16 byte output and 16 byte input. Each slot is configured to use 1 output byte and 1 input byte.

| I/O Create GSD Default Clock Oroject + Ippnio Files Layout Configuration PROFINET | lse | | | | | |
|-------------------------------------------------------------------------------------------------------------------------------|--------------|------------------|---------------|--------------------------|---|----|
| Configuration = × | Properties D | Device Catalogue | • | | | ₹> |
| Search 🗙 | Search | | | | × | X |
| Kemppi_A7-350-450.ioeprj - Controller: - | Vendor | Family | Device | Order Number Information | | |
| | | | Empty Module | | | |
| A Controller | Kemppi Oy | Output 1 byte | Output 1 byte | 9774121PRN | | |
| ▲ Impoiwid1 | Kemppi Oy | Output 1 word | Output 1 word | 9774121PRN | | |
| 00: RT Migration | Kemppi Oy | Output 2 word | Output 2 word | 9774121PRN | | |
| 01: Output 1 byte | Kemppi Oy | Output 4 word | Output 4 word | 9774121PRN | | |
| 02: Output 1 byte | Kemppi Oy | Input 1 byte | Input 1 byte | 9774121PRN | | |
| 03: Output 1 byte | Kemppi Oy | Input 1 word | Input 1 word | 9774121PRN | | |
| 04: Output 1 byte | Kemppi Oy | Input 2 word | Input 2 word | 9774121PRN | | |
| 05: Output 1 byte | Kemppi Oy | Input 4 word | Input 4 word | 9774121PRN | | |
| 06: Output 1 byte | | | | | | |
| 0/: Output 1 byte | | | | | | |
| 08: Output 1 byte | | | | | | |
| III 10: Output 1 byte | | | | | | |
| 11: Output 1 byte | | | | | | |
| 12: Output 1 byte | | | | | | |
| III 13: Output 1 byte | | | | | | |
| 14: Output 1 byte | | | | | | |
| 15: Output 1 byte | | | | | | |
| ▷ III 16: Output 1 byte | | | | | | |
| ▷ II 1/: Input 1 byte | | | | | | |
| IS: Input I byte | | | | | | |
| □ □ 15. Input 1 byte | | | | | | |
| 20. input 1 byte | | | | | | |
| 22: Input 1 byte | | | | | | |
| 23: Input 1 byte | | | | | | |
| 24: Input 1 byte | | | | | | |
| D 25: Input 1 byte | | | | | | |
| 26: Input 1 byte | | | | | | |
| ▷ 27: Input 1 byte | | | | | | |
| 28: Input 1 byte | | | | | | |
| | | | | | | |
| 31: Input 1 byte | | | | | | |
| ▷ 32: Input 1 byte | | | | | | |
| ⊳ 🚆 ioKemppiWld2 | | | | | | |
| ⊳ 🕎 ioKemppiWld3 | | | | | | |
| | | | | | | |

3 Fieldbus configuration

3.4 PROFINET configuration *Continued*

Fieldbus settings A7 web

The PROFINET settings on the welder can be verified using the web UI, in **Settings** > **Fieldbus**. The fieldbus settings are based on the default configuration installed with the Kemppi A7 add-in.

| FIELDBUS SETTINGS: PROFINET IO 2-PORT | | | | | | | | |
|---------------------------------------|-------------|-------|-------|--|-----|--|---|----|
| IDENTIFICATION INFORMATION | | | | | | | | |
| DEVICE ID | 1 0v0368 | | | | | | | |
| STATION TYPE | A7 MIG | i Wel | der | | | | | |
| DEVICE ORDER ID | 977412 | 1PRN | 12 | | | | | |
| SERIAL NUMBER | PSNKO | 17670 |)5 | | | | | |
| HARDWARE VERSION | 1 | | | | | | | |
| VERSION | V.2.11. | 1 | | | | | | |
| | | | | | | | | |
| ADAPTER INFORMATION | | | | | | | | |
| PORT 1 MAC ADDRESS | 00:30:1 | 1:13: | B9:FC | | | | | |
| PORT 2 MAC ADDRESS | 00:30:1 | 1:13: | B9:FD | | | | | |
| | | | | | | | | |
| CONFIGURATION PARAMETERS | | | | | | | | |
| DHCP | | | OFF | | | | | ON |
| | | | | | | | | |
| IP ADDRESS | 192 | | 168 | | 0 | | 2 | |
| | | | | | | | | |
| SUBNET MASK | 255 | | 255 | | 255 | | 0 | |
| | | | | | | | | |
| GATEWAY | | | | | | | | |
| GATEWAT | 192 | | 168 | | 0 | | 1 | |
| | | | | | | | | |

4 Watchdog functionality

Watchdog in IRC5

The Kemppi A7 interface has built in support for a watchdog functionality. The watchdog frequency is a fixed frequency of 0.5 Hz and cannot be changed in the robot controller. The functionality can be activated in the configuration (topic *Process*, PROC.cfg) in the type *Kemppi A7 Arc Equipment Properties* by setting *Enable Watchdog Output* to TRUE. In addition, the feature needs to be activated in the power source. See *Watchdog in A7 welder on page 35*.

| Instance Editor | | | | × |
|-------------------------------------------------------|---------------------------------------------|-------------|-----|--------|
| Name | Value | Information | | |
| Name | ARC1_KEMPPI_EQPR_A7_T_ROB1 | | | ^ |
| Use Equipment Standard IO | KEMPPI_A7_EQSTDIO_T_ROB1 ~ | | | |
| Use Kemppi A7 Equipment IO | KEMPPI_A7_EQIO_T_ROB1 | | | |
| Mode | Memory Channel Y | | | |
| Ignition on | TRUE FALSE | | | |
| Heat on | TRUE FALSE | | | |
| Heat defined as time | ○ TRUE ● FALSE | | | |
| Cool time on | TRUE FALSE | | | |
| Fill on | TRUE FALSE | | | |
| Arc Preset | 0 | | | |
| Ignition timeout | 3 | | | |
| Weld Off Timeout | 10 | | | |
| Override On | TRUE FALSE | | | |
| Autoinhibit On | TRUE FALSE | | | |
| Time to feed 15 mm wire | 0,95 | | | |
| Enable supervision on VC | TRUE FALSE | | | |
| Enable Watchdog Output | ○ TRUE ● FALSE | | | \sim |
| Value (string) The changes will not take effect of | until the controller is restarted. | | | |
| | | ОК | Car | ncel |

xx2200001869

Watchdog in A7 welder

The watchdog can be enabled and disabled either on the front panel or using the web UI. The following screenshot shows the configuration done with the web UI. The settings can be found in Welding Settings > Welding System.

| WATCHDOG SETTINGS | | |
|-------------------|-----|-------|
| | 277 | |
| A HATCHOOD | 0++ | |
| TIMEOUT | | 2.5 s |
| | | |

Continued

To use the watchdog with the fixed 0.5 Hz frequency generated by the A7 Interface, the timeout needs to be set higher than 2 seconds. Set it to 2.5 seconds.

Error 132

Error 132 is a communication error. This error typically indicates a communication problem on the fieldbus between the A7 welder and the robot controller.

| J.Z.J HODOLINICHACE CHOI | 5.2.5 | Robot | interface | errors |
|--------------------------|-------|-------|-----------|--------|
|--------------------------|-------|-------|-----------|--------|

| Code | Description | Severity |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 131 | FIELDBUS ERROR Failed to initialize the fieldbus card during start-up. The fieldbus module is missing, has been incorrectly connected, or is damaged. | Serious error |
| 132 | COMMUNICATION ERROR No connection to the robot. Fieldbus cable is broken or detached, or there is a robot failure or shutdown. Welding is interrupted when connection is lost. | Error |
| 133 | EMERGENCY STOP A user has pressed the emergency stop button. Welding is immediately interrupted. | Error |

xx2200001871



Error 132 can also be related to the watchdog. If communication to the robot controller is running, check the watchdog settings or switch it temporarily off to verify if error 132 disappears as no dedicated error message or error code is shown for a watchdog error.
5 Kemppi Interface Modes

Interface modes

Currently the Kemppi A7 welder interface has support for two modes, which will be customized by selecting the mode in the system parameters.



A warm start is required if the mode is changed.

| Interface mode | Description |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Memory Channel | The welding parameters (except for pre flow, post flow, and purge time) are stored and set in the power supply using memory channels. The memory channel number is set in the Weld Data editor. |
| Online Control | The basic parameters such as the synergic line are configured in the memory channel but Wire feed speed, Fine tuning, and the dynamics can be set from the robot. |

Setting the interface mode

The interface mode can be set in the **Configuration Editor** in RobotStudio or on the FlexPendant.

- 1 In the Configuration Editor, select the topic Process.
- 2 Select the type Kemppi A7 Arc Equipment Properties.
- 3 Select the robot and set the desired interface mode.
- 4 Restart the controller.

5 Kemppi Interface Modes

Continued

The configuration editor on the FlexPendant

| | Manual | Guard Stop | 3× 🗸 |
|----------------------------|----------------------------|--------------------------|-------------------|
| | DE-L-7302296 | Stopped (Speed 100%) | |
| Control Panel - Conf | iguration - Process - Kem | opi A7 Arc Equipment Pro | perties - ARC1_KE |
| | | | |
| Name: | ARC1_KEMPP | _EQPR_A7_T_ROB1 | |
| Tap a parameter twi | ice in order to modify it. | | |
| Parameter Name | | Value | 3 to 8 of 24 |
| Use Kemppi / | A7 Equipment IO | KEMPPI_A7_EQIO_ | |
| Mode | | Online Control | ^ |
| Ignition on | | Memory Channel | |
| Heat on | | Online Control | |
| Heat defined | as time | FALSE | |
| Cool time on | | TRUE | \mathbf{a} |
| | | ОК | Cancel |
| Production Window Scree | uction Control en Panel | | |
| xx2200001872 | | | |

The configuration editor in Robotstudio

| Instance Editor | | | | × |
|----------------------------------|---------------------------------------------|-------------|-----|------|
| Name | Value | Information | | |
| Name | ARC1_KEMPPI_EQPR_A7_T_ROB1 | | | 1 |
| Use Equipment Standard IO | KEMPPI_A7_EQSTDIO_T_ROB1 ~ | | | |
| Use Kemppi A7 Equipment IO | KEMPPI_A7_EQIO_T_ROB1 | | | |
| Mode | Online Control * | | | |
| Ignition on | Memory Channel | | | |
| | Online Control | | | |
| Heat on | TRUE FALSE | | | |
| Heat defined as time | ○ TRUE ● FALSE | | | |
| Cool time on | TRUE FALSE | | | |
| Fill on | TRUE FALSE | | | |
| Arc Preset | 0 | | | |
| Ignition timeout | 3 | | | |
| Weld Off Timeout | 10 | | | |
| Override On | TRUE FALSE | | | |
| Autoinhibit On | TRUE FALSE | | | |
| Time to feed 15 mm wire | 0,95 | | | |
| Enable supervision on VC | TRUE FALSE | | | |
| Enable Watchdog Output | TRUE FALSE | | | |
| Value (string) | | | | |
| The changes will not take effect | until the controller is restarted. | | | |
| | | OK | Car | ncel |

xx2200001873

6.1 Introduction

6 Weld Editor Interface

6.1 Introduction

| The graphical user interface for the FlexPendant is called the <i>Weld Editor Interface</i> . The information is presented in widgets, which are small applications available when starting the application <i>Production Screen</i> on the FlexPendant. The Weld Editor Interface consists of tabs where the user can process and modify information such as: • Ignition parameter • Heat parameters • Weld parameters • End parameters Unlike the regular data editor, it combines seam data and weld data for intuitive process setup and allows them to be modified at the same time. The Weld Data Editor also validates the data based on information from the welder. The data to edit can be selected either by moving the program pointer to a weld instruction or by using the last weld and seam data. |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Heat parameters Weld parameters End parameters End parameters Unlike the regular data editor, it combines seam data and weld data for intuitive process setup and allows them to be modified at the same time. The Weld Data Editor also validates the data based on information from the welder. The data to edit can be selected either by moving the program pointer to a weld instruction or by using the last weld and seam data. |
| Weld parameters End parameters Unlike the regular data editor, it combines seam data and weld data for intuitive process setup and allows them to be modified at the same time. The Weld Data Editor also validates the data based on information from the welder. The data to edit can be selected either by moving the program pointer to a weld instruction or by using the last weld and seam data. |
| • End parameters Unlike the regular data editor, it combines seam data and weld data for intuitive process setup and allows them to be modified at the same time. The Weld Data Editor also validates the data based on information from the welder. The data to edit can be selected either by moving the program pointer to a weld instruction or by using the last weld and seam data. The default Kemppi A7 installation contains a weld status widget. It is placed on |
| Unlike the regular data editor, it combines seam data and weld data for intuitive process setup and allows them to be modified at the same time. The Weld Data Editor also validates the data based on information from the welder. The data to edit can be selected either by moving the program pointer to a weld instruction or by using the last weld and seam data. |
| The default Kemppi A7 installation contains a weld status widget. It is placed on |
| The default Kemppi A7 installation contains a weld status widget. It is placed on |
| widget page 1. The widget displays the following useful information: |
| Program pointer |
| Seam name |
| Current arc instruction data |
| For example, (1) p22, sm2, wdWeavel1, wv1 (1 = Arc instruction sequence number). |
| Current weld speed |
| Current weld mode |
| In Memory Channel, the channel number is shown |
| • In online control mode, the additional information such as wire feed speed, fine tuning, and dynamics are shown |
| Process (currently active process) |
| Process status, weld on/off, active weld error, real-time voltage and current |
| To switch between robots in a MultiMove setup, use the robot task selector in the upper right corner of the widget. |
| |

6.1 Introduction *Continued*

| Memory Channel mod | de | | | | | | |
|--------------------|------------------------------|---------------------|--------------|-------------------------|-------------------|---------|----------------|
| | | Auto DE-L-730229 | 6 | Motors On Running (S | peed 100%) | ž | ×× |
| | Page 1 | | | | | • • | • • |
| | - T_ROB1 Prog Po | inter | SeamName | | | | |
| | PART_1 | | Seam_1 | | | T_ROB | |
| | (2) *, seam1, | weld1, we | ave1, track1 | | | | ▼ |
| | Memory Channel Weld Speed | 1 Proc 7 [mm | ess 1-MIG | | Process - On | • Error | |
| | | | | | 40,7 | 310 | 0,0 |
| | | | | | Volt | Amp | Gas |
| | < 🖓 | P | | | $\mathbf{\nabla}$ | \sim | r>) |
| | Setup | Service | Info | Part | A7 MIG R1 | WvTr F | u 1/2 |
| | Production Window Scree | luction en | | | | | © _© |
| × | xx2200001874 | | | | | | |

Online control mode

| | Auto DE-L-73 | 302296 | | Motors Or Running (| 1 5peed 100%) | 1 | ×× X |
|----------------------------|----------------------------------------------------------|---------|-------|------------------------|--------------------|--------|----------------|
| Page 1 | | | | | | • • | • ÷ |
| - T_ROB1 Prog Po PART_1 | T_ROB1 Prog Pointer SeamName PART_1 Seam_1 | | | | | | |
| "13:03:58 Sta | arted K | emppi E | quip" | | | | |
| Memory Channel | 1 | Process | 1-MI | G | Process | O Erro | r |
| Weld Speed | 7 | [mm/s] | | | • • | | |
| Wirefeed Speed | 8 | [m/min] | Range | < 0.5 - 25.0 > | 44,3 | 398 | 0,0 |
| FineTuning | 0 | [Volt] | Range | < -9.0 - + 9.0 > | | | 6 |
| Dynamics | 0 | [steps] | Range | < -9.0 - + 9.0 > | Volt | Amp | Gas |
| < 428 | P |) | 1 | | \bigtriangledown | ĥ | 7* |
| Setup | Service | e 1 | Info | Part | A7 MIG R | 1 WvTr | R1 1/2 |
| Production Window | duction een | | | | | | 0 ₀ |
| xx2200001875 | | | | | | | |

6.1 Introduction Continued

Starting the Weld Editor Interface

- 1 On the FlexPendant, tap the ABB menu and then tap **Production Screen**.
- 2 Tap A7 MIG R1 to start the Weld Editor widget.
- 3 Tap **Production Screen** to close the window and return to the previous window.

6.2 Weld Editor in online control mode

6.2 Weld Editor in online control mode

Ignition parameters

Tap the Ignition tab to view or modify the ignition phase parameters.

Note

Do not manipulate seam/welddata using the RAPID datatype editor. This can result in unwanted behavior and wrong welding parameters which can in worst case damage your welding equipment. Use the Weld mode editor.

The ignition phase parameters can only be modified in manual mode.



To copy the current weld phase mode settings, toggle **Use Weld Phase Mode** off, on, and then off again.

| Seam: seam1, Weld: we | anual E-L-7302296 eld1 | Guard Stop Stopped (Speed 100% | 6) E X |
|----------------------------------|------------------------------|-----------------------------------|----------------------|
| <mainmodule>TASK PI</mainmodule> | ERS seam1:=[0,0,[7,0,0, | 133.333,1.5,2,0,0,0],0,0 | ,0,0,0,[0,0,0,0,0,0, |
| Ignition | Heat | Weld | End |
| Purge Time | 0 s | Ign Move Delay | 0 s |
| Pre Flow | 0 s | | |
| | | Use Weld Phase | Mode |
| Memory Channel < | 7 > | | |
| Wirefeed Speed < | 8.00 > Range | <0,5 - 25,0> m/min | |
| Fine Tuning < | 1.5 > Range | <-9,0 - 9,0> Volt | |
| Dynamics < | 2 > Range | <-9 - 9> | |
| | | | |
| 0 | 1 | 8 | |
| Production Window Screen | ion | | |
| xx2200001876 | | | |

| Button | Description |
|---------|-----------------------------------------------------------------------------------------|
| Refresh | Use the blue refresh button to return to the Weld Phase tab. |
| Confirm | Use the green check button to confirm any changes made. |
| Cancel | Use the red cancel button to cancel any changes made and return to the previous values. |

6.2 Weld Editor in online control mode *Continued*

| Parameter | Description |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ign Move Delay | The delay (in seconds) from the time the arc is considered stable at igni- tion until the heat phase is started. |
| Purge Time | The time (in seconds) it takes to fill the gas lines and the welding gun with protective gas, also called <i>gas purging</i> . |
| Pre-Flow Time | The time (in seconds) it takes to pre-flow the weld object with protective gas, also called <i>gas pre-flow</i> . |
| Use Weld Phase Mode | Not selected: Select weld parameters during ignition phase manually. Selected: Use the parameters from the Weld tab. This is the default mode. |
| Memory Channel | This represents the memory channel in the welder. |
| Wire Feed Speed | This is the wire feed speed. |
| Fine Tuning | This parameter represents the arc length when welding in synergic mode. The range is -9.0 to +9.0. -9 = shorter arc 0 = value from line +9 longer arc The actual value range in Volts is also shown as, Actual <x.x y.y="" –=""> [V].</x.x> |
| Dynamics | Control the arc behavior in short circuit. A lower value results in a softer arc and a higher value result in a rougher arc. The allowed value is -9 to +9. |

Heat parameters

Tap the **Heat** tab to view or modify heat phase parameters.



The heat phase parameters can only be modified in manual mode.



To copy the current weld phase mode settings, toggle **Use Weld Phase Mode** off, on, and then off again.

6.2 Weld Editor in online control mode *Continued*

| Image: Wanual period Guard Stop get Stopped (Speed 100%) Seam: seam1, Weld: weld1 | | | | |
|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|------|--|
| Ignition | Heat | Weld | End | |
| Heat Dist Heat Speed < | 0 mm 7 > mm/s 1 > 8.00 > Range 1.5 > Range 0 > Range | Use Weld Phase N <0,5 - 25,0> m/min <-9,0 - 9,0> Volt <-9 - 9> | Mode | |
| Production Window Product | ion | 8 | | |

xx2200001877

| Button | Description |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Refresh | Use the blue refresh button to return to the Weld Phase tab. |
| Confirm | Use the green check button to confirm any changes made. |
| Cancel | Use the red cancel button to cancel any changes made and return to the previous values. |
| Parameter | Description |
| Heat Dist / Heat as time | The distance during which the heat data is active at the start of the weld. If the parameter <i>Heat as time</i> is active, the distance will be replaced by time (in seconds). |
| Heat Speed | The welding speed during the heat phase at the start of the weld phase. |
| Use Weld Phase Mode | Not selected: Select weld parameters during ignition phase manually. Selected: Use the parameters from the Weld tab. This is the default mode. |
| Memory Channel | This represents the memory channel in the welder. |
| Wire Feed Speed | This is the wire feed speed. |
| Fine Tuning | This parameter represents the arc length when welding in synergic mode. The range is -9.0 to +9.0. -9 = shorter arc 0 = value from line +9 longer arc The actual value range in Volts is also shown as, Actual <x.x y.y="" –=""> [V].</x.x> |
| Dynamics | Control the arc behavior in short circuit. A lower value results in a softer arc and a higher value result in a rougher arc. The allowed value is -9 to $+9$. |

Continues on next page

6.2 Weld Editor in online control mode *Continued*

Weld parameters

Tap the Weld tab to view or modify weld phase parameters.

| Note | | | | | |
|----------------------------------------------|-----------------------------------------------------------------|-----------------------------------|--------------------|--|--|
| Seam: seam1, Weld: we | ianual E-L-7302296 eld1 | Guard Stop Stopped (Speed 100% | .) E X | | |
| <mainmodule>TASK PI</mainmodule> | ERS weld1:=[7,0,[1,0,0, | 133.333,1.5,0,0,0,0],[0,0 | ,0,0,0,0,0,0,0,0]] | | |
| | | | | | |
| Weld Speed < Memory Channel < Wirefeed Speed | 7 > mm/s 1 > Unkno | wn Process | | | |
| Fine Tuning < Dynamics < | 2.0 > Range 0 > Range | <-9,0 - 9,0> Volt | | | |
| Production & Producti Window | ion | 8 | | | |

xx2200001878

| Button | Description |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Refresh | Use the blue refresh button to return to the Weld Phase tab. |
| Confirm | Use the green check button to confirm any changes made. |
| Cancel | Use the red cancel button to cancel any changes made and return to the previous values. |
| Parameter | Description |
| Weld speed | The speed of the TCP of the welding torch during the weld instruction. |
| Memory Channel | This represents the memory channel in the welder. |
| Wire Feed Speed | This is the wire feed speed. |
| Fine Tuning | This parameter represents the arc length when welding in synergic mode. The range is -9.0 to +9.0. -9 = shorter arc 0 = value from line +9 longer arc The actual value range in Volts is also shown as, Actual < x.x – y.y > [V]. |
| Dynamics | Control the arc behavior in short circuit. A lower value results in a softer arc and a higher value result in a rougher arc. The allowed value is -9 to +9. |

45

6.2 Weld Editor in online control mode *Continued*

| End parameters | Tap the End tab | to view or modif | y end pł | nase parameters | 5. | |
|-----------------------------------|------------------------------------|---------------------------------------------------------|------------------------|------------------------------------------|------------------------------------|--------------------------------|
| | Note | | | | | |
| The end phase parameters can only | | | | modified in mar | nual mode. | |
| | Тір | | | | | |
| | To copy the cu off, on, and the | irrent weld phase en off again. | mode s | ettings, toggle l | Jse Weld Ph | ase Mode |
| | | Manual DE-L-7302296 | | Guard Stop Stopped (Speed | 100%) | × × |
| | Seam: seam1, We | ld: weld1 | | | | |
| | <mainmodule>TAS</mainmodule> | SK PERS seam1:=[0 | , 0,[7,0,0 ,: | 133.333,3.2,2,0,0,0] | ,0,0,7,0,0,[1, 0 | ,0,133.3 |
| | Ignition | Heat | | Weld | | End |
| | Cool Time | 0 s | | Post Flow | 0 | s |
| | Fill Time | 0 s | | | | |
| | | | | Use Weld Ph | ase Mode | |
| | Memory Channel | < 1 > |] | _ | | |
| | Wirefeed Speed | < 8.00 > | Range | <0,5 - 25,0> m/ | min | |
| | Fine Tuning | < 0 > | Range | <-9,0 - 9,0> Vol | t | |
| | Dynamics | < 1 > | Range | <-9 - 9> | | |
| | | | | | | |
| | \odot | | | (| 3 | |
| | Production Window | roduction | | | | |
| | xx2200001879 | | | | | |
| | Button | Description | | | | |
| | Refresh | Use the blue refre | sh buttor | n to return to the V | Veld Phase ta | b. |
| | Confirm | Use the green che | ck butto | n to confirm any c | hanges made | |
| | Cancel | Use the red cance previous values. | l button to | o cancel any chan | ges made and | return to the |
| | Parameter | Description | | | | |
| | Cool Time | The time (in secor weld to cool befor take place. | ds) durin e other e | ng which the proce nd activities such | ess is stopped as crater fill a | , allowing the nd burn back |
| | Fill Time | The crater-filling t | me (in se | econds) at the end | d phase of the | weld. |
| | Post Flow | The time (in secor process. | ds) for pi | urging with protec | tive gas after t | he end of the |

6.2 Weld Editor in online control mode *Continued*

| Parameter | Description |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Use Weld Phase Mode | Not selected: Select weld parameters during ignition phase manually. Selected: Use the parameters from the Weld tab. This is the default mode. |
| Memory Channel | This represents the memory channel in the welder. |
| Wire Feed Speed | This is the wire feed speed. |
| Fine Tuning | This parameter represents the arc length when welding in synergic mode. The range is -9.0 to +9.0. -9 = shorter arc |
| | 0 = value from line +9 longer arc The actual value range in Volts is also shown as, Actual <x.x y.y="" –=""> [V].</x.x> |
| Dynamics | Control the arc behavior in short circuit. A lower value results in a softer arc and a higher value result in a rougher arc. The allowed value is -9 to +9. |

6.3 Weld Editor in Memory Channel mode

6.3 Weld Editor in Memory Channel mode

Ignition parameters

Tap the **Ignition** tab to view or modify the ignition phase parameters.

Note

Do not manipulate seam/welddata using the RAPID datatype editor. This can result in unwanted behavior and wrong welding parameters which can in worst case damage your welding equipment. Use the Weld mode editor.

The ignition phase parameters can only be modified in manual mode.



To copy the current weld phase mode settings, toggle **Use Weld Phase Mode** off, on, and then off again.

| Image: Wanual DE-L-7302296 Guard Stop Stopped (Speed 100%) Seam: seam1, Weld: weld1 <mainmodule>TASK PERS seam1:=[0,0,[7,0,0,133.333,3.2,2,0,0,0],0,0,7,0,0,[1,0,0,133.33.</mainmodule> | | | (a) ∑ (b) √ (b) √ (c) √ (|
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ignition | Heat | Weld | End |
| Purge Time | 0 s | Ign Move Delay | 0 s |
| Pre Flow | 0 s | | |
| Memory Channel < | 8 > | Use Weld Phase | Mode |
| 0 | 1 | 8 | |
| Production Window Screen | ion | | |

xx2200001880

| Button | Description |
|---------|-----------------------------------------------------------------------------------------|
| Refresh | Use the blue refresh button to return to the Weld Phase tab. |
| Confirm | Use the green check button to confirm any changes made. |
| Cancel | Use the red cancel button to cancel any changes made and return to the previous values. |

6.3 Weld Editor in Memory Channel mode *Continued*

| Parameter | Description |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ign Move Delay | The delay (in seconds) from the time the arc is considered stable at igni- tion until the heat phase is started. |
| Purge Time | The time (in seconds) it takes to fill the gas lines and the welding gun with protective gas, also called <i>gas purging</i> . |
| Pre-Flow Time | The time (in seconds) it takes to pre-flow the weld object with protective gas, also called <i>gas pre-flow</i> . |
| Use Weld Phase Mode | Not selected: Select weld parameters during ignition phase manually. Selected: Use the parameters from the Weld tab. This is the default mode. |
| Memory Channel | The memory channel (schedule) that should be selected within the welder. |

Heat parameters

Tap the Heat tab to view or modify heat phase parameters.



The heat phase parameters can only be modified in manual mode.

| т | ip |
|---|----|
|---|----|

To copy the current weld phase mode settings, toggle **Use Weld Phase Mode** off, on, and then off again.

| Manual Guard Stop DE-L-7302296 Stopped (Speed 100%) Seam: seam1, Weld: weld1 | | | ., 🖭 |
|--------------------------------------------------------------------------------------------------|---------------------------|------------------------------|--------------------|
| <mainmodule>TASK PI</mainmodule> | ERS seam1:=[0,0,[7,0,0, | ,133.333,3.2,2,0,0,0,0,0,0,0 | 7,0,0,[1,0,0,133.3 |
| Ignition | Heat | Weld | End |
| Heat Dist Heat Speed < Memory Channel < | 0 mm 7.5 > mm/s 1 > | Use Weld Phase I | Mode |
| \odot | | 8 | e |
| Production Window Screen | ion | | |

xx2200001881

49

6.3 Weld Editor in Memory Channel mode *Continued*

| Button | Description |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Refresh | Use the blue refresh button to return to the Weld Phase tab. |
| Confirm | Use the green check button to confirm any changes made. |
| Cancel | Use the red cancel button to cancel any changes made and return to the previous values. |
| Parameter | Description |
| Heat Dist / Heat as time | The distance during which the heat data is active at the start of the weld. If the parameter <i>Heat as time</i> is active, the distance will be replaced by time (in seconds). |
| Heat Speed | The welding speed during the heat phase at the start of the weld phase. |
| Use Weld Phase Mode | Not selected: Select weld parameters during ignition phase manually. Selected: Use the parameters from the Weld tab. This is the default mode. |
| Memory Channel | The memory channel (schedule) that should be selected within the welder. |

Weld parameters

Tap the Weld tab to view or modify weld phase parameters.



The weld phase parameters can only be modified in manual mode.

| Image: Wanual Council of the search | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------------|---------|--|
| Ignition | Heat | Weld | End | |
| Weld Speed < Memory Channel < | 7.5 > mm/s 1 > Unkno | wn Process | | |
| 0 | • | 8 | | |
| Production Window Screen | ion | | | |
| xx2200001882 | | | | |

| Button | Description |
|---------|--------------------------------------------------------------|
| Refresh | Use the blue refresh button to return to the Weld Phase tab. |

Continues on next page

6.3 Weld Editor in Memory Channel mode *Continued*

| Button | Description |
|----------------|-----------------------------------------------------------------------------------------|
| Confirm | Use the green check button to confirm any changes made. |
| Cancel | Use the red cancel button to cancel any changes made and return to the previous values. |
| | |
| Parameter | Description |
| Weld speed | The speed of the TCP of the welding torch during the weld instruction. |
| Memory Channel | The memory channel (schedule) that should be selected within the welder. |

End parameters

Tap the End tab to view or modify end phase parameters.



The end phase parameters can only be modified in manual mode.



To copy the current weld phase mode settings, toggle **Use Weld Phase Mode** off, on, and then off again.

| Seam: seam1, Weld: weld1 | | Guard Stop Stopped (Speed 100% | (6) |
|------------------------------------------------------------|-----------------------|-----------------------------------|---------------------|
| <mainmodule>TASK PE</mainmodule> | RS seam1:=[0,0,[7,0,0 | ,133.333,3.2,2,0,0,0],0,0 | ,7.5,0,0,[1,0,0,133 |
| Ignition | Heat | Weld | End |
| Cool Time | 0 s | Post Flow | 0 s |
| Fill Time | 0.5 s | | |
| Memory Channel < | 1 > | Use Weld Phase | Mode |
| Production Production Window Production Screen | on | 8 | |

xx2200001883

| Button | Description |
|---------|--------------------------------------------------------------|
| Refresh | Use the blue refresh button to return to the Weld Phase tab. |
| Confirm | Use the green check button to confirm any changes made. |

Continues on next page

6.3 Weld Editor in Memory Channel mode *Continued*

| Button | Description |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cancel | Use the red cancel button to cancel any changes made and return to the previous values. |
| Parameter | Description |
| Cool Time | The time (in seconds) during which the process is stopped, allowing the weld to cool before other end activities such as crater fill and burn back take place. |
| Fill Time | The crater-filling time (in seconds) at the end phase of the weld. |
| Post Flow | The time (in seconds) for purging with protective gas after the end of the process. |
| Use Weld Phase Mode | Not selected: Select weld parameters during ignition phase manually. Selected: Use the parameters from the Weld tab. This is the default mode. |
| Memory Channel | The memory channel (schedule) that should be selected within the welder. |

6.4 Tuning of weld parameters

6.4 Tuning of weld parameters

Introduction

Weld parameters marked with the arrows in the Weld Editor can be tuned, either offline (when not welding) or online (when welding).

When welding, these parameters can be tuned within the range with immediate response. Parameters in the **Weld** tab are easiest to tune.

Parameters that can be tuned in online control mode:

- Weld Speed
- Wirefeed Speed
- Fine Tuning
- Dynamics

Parameters that can be tuned in Memory Channel mode:

• Weld Speed

6.5 How to edit welddata using the partdata concept

6.5 How to edit welddata using the partdata concept

The partdata concept

The option *Production Manager* is needed to be able to use the partdata concept. Even though Production Manager is not configured to control the robot cell, its partdata concept can be used to edit welddata.

Additional information on how to use Production Manager and its part data can be found in *Application manual Production Manager*.

The optional argument \seamName has to be used in the instruction ArcLStart to be able to show the seam in the editor.

Example

Here is an example how the welddata can be changed without the RAPID data editor or moving the program pointer around. The example consists of three parts which are configured in Production Manager.

| ■ ∨ & | Manual DE-L-7008262 | Guard Stop Stopped (Speed 1 | 00%) X |
|---------------------------|------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | T_ROB | 1 | |
| Station 1 | | | |
| Select part f | rom list or create new | v part | Control of the second s |
| Part 🛆 | Description | | |
| <empty></empty> | None | | |
| Part_1 | Discription of Part_1 | | |
| Part_2 | Discription of Part_2 | | and the |
| Part_3 | Discription of Part_3 | | |
| | | | |
| Test Part | New Edit | . [^] 01 | Cancel |
| Production Window Scre | fuction | | |

xx2200001884

54

6.5 How to edit welddata using the partdata concept *Continued*

RAPID example

| 10 | TASK PEPS partdata of Part 1["Part 1" "Discription of Part 1" "" 1.0 "" ""]. |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11 | TASK FERS particular purant_1:=[rant_1 , Distribution of Part_1 , j,joy , j]; |
| 12 | TASK FERS particular pu_rait_2:-[rait_2; Discription of rait_2; , 1,6; ,]; |
| 12 | [INSK PERS partiality purple [Inst [Inst Percent Provide Part [Inst Percent Pe |
| 14 | |
| 15 | EPROC Part 1() |
| 15 | |
| 10 | Actual Sin; |
| 1/ | Moves p1, v1000, 210, tweIdgun (wbg)==wog)stn; |
| 10 | Arctstart p2,v1000,sm1,w01,t1ne,twe1dun1w00]:=w00jstn1/Seamwame:= Part_1_vtn_1_we1d_1; |
| 19 | Arct p5, v100, sm1, v01, z1, twe1doun (wbp):=wobjstn1; |
| 20 | Arct p4, v100, sm1, v01, z1, twe1doun (wob) t= wob) stn1; |
| 21 | Arct ps, vi00, smi, w01, z1, tweiduun (w00) := w00) stni; |
| 22 | ArcLEnd pb, v100, sml, wal, Tine, tweldgun (wob):=wob)stnl; |
| 23 | MoveL p/,v1000,z10,tWeldGun(WObj:=wobjStn1; |
| 24 | LENDPROC |
| 25 | |
| 26 | |
| 27 | |
| 28 | PROC Part_2() |
| 29 | ActUnit STN1; |
| 30 | MoveJ p1,v1000,z10,tWeldGun\WObj:=wobjStn1; |
| 31 | ArcLStart p2,v1000,sm2,wd2,fine,tWeldGun\WObj:=wobjStn1\SeamName:="Part_2Pth_1_Weld_1"; |
| 32 | ArcL p3, v100, sm2, wd2, z1, tWeldGun \WObj:=wobjStn1; |
| 33 | ArcL p4,v100,sm2,wd2,z1,tWeldGun\WObj:=wobjStn1; |
| 34 | ArcL p5,v100,sm2,wd2,z1,tWeldGun\WObj:=wobjStn1; |
| 35 | ArcLEnd p6,v100,sm2,wd2,fine,tWeldGun\WObj:=wobjStn1; |
| 36 | MoveL p7,v1000,z10,tWeldGun\WObj:=wobjStn1; |
| 37 | LENDPROC |
| 38 | |
| 39 | PROC Part_3() |
| 40 | ActUnit STN1; |
| 41 | MoveJ p1,v1000,z10,tWeldGun\WObj:=wobjStn1; |
| 42 | <pre>ArcLStart p2,v1000,sm3,wd3,fine,tWeldGun\WObj:=wobjStn1\SeamName:="Part_3_Pth_1_Weld_1";</pre> |
| 43 | <pre>ArcL p3,v100,sm3,wd3,z1,tWeldGun\WObj:=wobjStn1;</pre> |
| 44 | ArcL p4,v100,sm3,wd3,z1,tWeldGun\WObj:=wobjStn1; |
| 45 | <pre>ArcL p5,v100,sm3,wd3,z1,tWeldGun\WObj:=wobjStn1;</pre> |
| 46 | ArcLEnd p6,v100,sm3,wd3,fine,tWeldGun\WObj:=wobjStn1; |
| 47 | MoveL p7,v1000,z10,tWeldGun\WObj:=wobjStn1; |
| 48 | LENDPROC |
| | |

xx2200001885

6.5 How to edit welddata using the partdata concept *Continued*

The welddata can now selected from the Kemppi Production Screen application by selecting the partdata. Start the Kemppi A7 Application and press the partdata button (looking like a small chess board).



xx2200001886

56

6.5 How to edit welddata using the partdata concept *Continued*

This will start the following screen and present all partdata found in the system.

| Weld Parameters | Manual DE-L-7008262 | Guard Stop Stopped (Speed | i 100%) | X |
|--------------------------------------|------------------------|------------------------------|---------|----------|
| | | | | |
| Programmed targe | ts — | | | |
| 🔁 pd_Part_1 | | | | |
| pd_Part_2 | | | | |
| 🔁 pd_Part_3 | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | <u>}</u> |
| | | | Ok Clos | se |
| Production Window Scree | uction | | | OB_1 |

xx2200001887

Click on the partdata to edit. In this example, **Part_2_Pth_1_Weld_1**. The used seamdata/welddata is shown in the header. In this example, **sm2/wd2**.

| Weld Parameters | Manual DE-L-7008262 | Guard Stop Stopped (Speed 100 | ») X |
|----------------------------------------------|------------------------|----------------------------------|-------------|
| sm2 wd2 Programmed targe pd Part 1 | ts — | | |
| <pre>pd_rant_r pd_Part_2 pd_Part_2 pth</pre> | 1 Wold 1 | | |
| pd_Part_3 | T_ m einT | | |
| | | | |
| | | | |
| | | Ok | Close |
| Production Window Scree | luction | | |

xx2200001888

6.5 How to edit welddata using the partdata concept *Continued*

Tap **Ok** to go back to the Weld Data editor. The editor automatically selects the used seam/welddata from the part. The header is now updated with **sm2/wd2**. To update the editor with the value from the seam/welddata, tap the blue **Refresh** button.

7 System parameters

Overview

The Kemppi Equipment Class and settings are automatically activated after the controller is started with the Kemppi add-in.

This option has advanced support for a Kemppi A7 350/450 power source that includes support for two welding modes:

- Memory Channel
- Online control

Kemppi A7 Equipment Properties

| Parameter | Data type | Description |
|---------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name | string | The name of the <i>Fronius Equipment Proper-</i> ties. |
| Use Equipment Standard IO | string | The name of the <i>Equipment Standard IO</i> to use. |
| Use Fronius Equipment IO | string | The name of the <i>Equipment Standard IO</i> to use. |
| Mode | string | The mode of the welder. The following modes are available: Memory Channel, this is default Online Control |
| Ignition on | bool | Specifies if the ignition data specified in seamdata is to be used at the start of the weld phase. At the start it is often beneficial to define higher weld data values for a better ignition. If the ignition data parameter is changed, the contents of seamdata will also change. Default value: FALSE |
| Heat on | bool | When the arc is ignited, the seam will gener- ally not have reached the correct temperat- ure. Pre-heating can thus be used at the start of the weld to define higher weld data values. If the pre-heating parameter is changed, the contents of seamdata will also change. Default value: FALSE |
| Heat defined as time | bool | Specifies if the heat phase should use the seamdata parameters heat_time or heat_distance. TRUE means that heat_time is used and visible in the seamdata. FALSE means that heat_distance and heat_speed is used and visible in the seamdata. Default value: FALSE |
| Cool time on | bool | Enables masking of the cool_time compon- ent in seamdata. Default value: FALSE |

Continued

| Parameter | Data type | Description |
|--------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fill on | bool | Specifies whether a crater fill is to be used in the final phase. This means that the end crater that can form in the completed weld will be filled in with extra filler material. If the crater fill parameter is changed, the contents of seamdata will also change. Default value: FALSE |
| Arc Preset | num | Delays the power control signal with this time (seconds). This gives the analog reference signals and group output signals enough time to stabilize before the weld is started. Default value: 0 |
| Ignition Timeout | num | The maximum time (in seconds) permitted for igniting the welding arc. Default value: 3 |
| Weld off timeout | num | The maximum time (in seconds) permitted for shutting off the welding arc. Default value: 10 |
| Override On | bool | Specifies the visibility of the org value com- ponents in welddata. Default value: TRUE |
| Auto inhibition on | bool | If this flag is set, weld inhibition will be al- lowed in AUTO mode, otherwise not allowed. Default value: FALSE |
| Time to feed 15 mm wire | num | The time in seconds to feed 15 mm of wire. Default value: 0.95 |
| Enable supervision in VC | bool | Enables signal supervision in the virtual controller. Default value: FALSE |
| Enable Watchdog Output | bool | Enable the watchdog functionality with a fixed frequency of 0.5 Hz (2 seconds). Default value: FALSE The watchdog feature must be enabled in the welder. |
| Allow tuning in Auto | bool | If this flag is set tuning of welddata is allowed in auto mode. Default value: FALSE |
| Block tuning in Manual | bool | If this flag is set, edit and tuning will be blocked in manual mode from the TPSi editor and from the Weave & Track data editor. Default value: FALSE |
| Enable Wire Retract | bool | If this flag is set, the wire will be retracted at the end and of weld and feed at start (the specified time in <i>Time to feed 15mm wire</i> . Default value: FALSE |
| Widget Screen | num | Specifies the start screen (widget) for Produc- tion Screen. (Not yet implemented.) |
| Service port IP | num | The IP address of the welder's service port. This is used in conjunction with the RobotStu- dio add-in. |

Continued

| Parameter | Data type | Description |
|--------------------------------|-----------|-----------------------------------------------------------------------------------------------------------------|
| Arc Stable Filter Time Active | num | The active filter time on arc stable. Default value: 50 ms Minimum value: 0 ms Maximum value: 1000 ms |
| Arc Stable Filter Time passive | num | The passive filter time on arc stable. Default value: 50 ms Minimum value: 0 ms Maximum value: 1000 ms |

Kemppi A7 Equipment IO

| Parameter | Data type | Description |
|--------------------------|-----------|------------------------------------------------------------------------------------------------------------------------|
| ArcEst Label | string | Label describing the error level of the signal. There are three available levels, MAJOR, MINOR, and INFO. |
| WaterOK DI | signaldi | Digital input signal for supervision of the wa- ter. A high signal means that the water is OK. |
| GasOK DI | signaldi | Digital input signal for supervision of the protective gas. A high signal means that the protective gas is OK. |
| Supervision Welder DO | signaldo | Digital output signal that indicates welder supervision. |
| Supervision Arc DO | signaldo | Digital output signal for indication of welding arc errors. A high signal means that an error has occurred. |
| Supervision Water DO | signaldo | Digital output signal for indication of cooling water errors. A high signal means that an error has occurred. |
| Supervision Gas DO | signaldo | Digital output signal for indication of protect- ive gas errors. A high signal means that an error has occurred. |
| Supervision Wirestick DO | signaldo | Digital output signal for indication of wire feed errors. A high signal means that an error has occurred. |

This page is intentionally left blank

8.1 Introduction

8 Seam Tracking with A7 MIG Welder 350/450

8.1 Introduction

| About KEMPPI A | 7 IRC5 seam tracking |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | This guide describes the ABB Robotics IRC5 interface for: |
| | KEMPPI A7 Seam Tracking with fieldbus interface |
| | The power source must meet the requirements specified in section <i>About Kemppi A7 MIG Welder interface on page 9</i> . |
| Overview | |
| | The A7 MIG Welder power sources are based on top of the class inverter technology. They belong to the high-end system class of Kemppi products. |
| | There is a wide range of processes to choose from: MIG, 1-MIG, Pulse, Double Pulse, Brazing, Cladding, WiseRoot+, WiseThin+, WiseFusion, and WisePenetration. |
| | The system can be configured to contain an optimal choice of just the right welding programs for the application. There are welding programs available for all the common filler wire and shielding gas combinations for mild steel, stainless steel, and aluminum. |
| General functiona | ality |
| | The KEMPPI Tracking function is a powerful software based Through Arc Seam Tracking (TAST) RobotWare option. |
| | Through-Arc Seam Tracking (TAST) is used in arc welding for following a welding groove automatically by weaving the welding gun and measuring the arc length. The seam tracking provides precise welds in setups where the workpiece position within repetitive tasks varies, or when the route of the groove is complicated. |
| | The arc length depends on the wire tip distance from the middle of the groove. Weaving the welding gun between the edges of the groove generates a signal that is directly proportional to the arc length. The generated signal is equivalent to the welding current. |
| | The welding power source measures welding current as a contiguous value during welding. It filters the raw current value to generate a stable signal for the TAST. The TAST signal is valid for all MIG/MAG processes including Pulse MIG and Double Pulse MIG. The TAST signal is passed to the welding robot as a numeric value using the digital robot interface. Using the TAST requires use of certain I/O tables containing a field for the TAST value and the control signal. |
| | The TAST signal is composed inside the power source using welding current and voltage. Value changes as stick-out length varies during welding and is used for real time correction of the weld location during welding. |
| | Note The TAST signal is updated approximately every 10 ms (100Hz). |

8.2 Installation

8.2 Installation

| Prerequisites for t | he robot controller |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | IRC5 robot controller with main computer DSQC1000 or later |
| | RobotWare version 6.14 or later with the following options: |
| | - RobotWare Arc |
| | - Production Screen |
| | - Tracking Interface |
| | - Add-in for Kemppi A7 welder |
| Kemppi firmware | |
| | The A7 Welder must meet the following Firmware versions for Seam Tracking: |
| | A7 MIG Welder Robot Interface Firmware >= 1.05.00.0 |
| | A7 MIG Welder Firmware >= 1.04.00.0 OR If S/N >=3018192 Firmware 2.01 |
| RobotStudio | |
| | RobotStudio version 2022 or later |
| Kemppi Tracking A | Add-In supported functions |
| | The Add-In supports the following tracking functions: |
| | Centerline tracking |
| | (Corrections are applied for Y/Z) |
| | Height tracking only |
| | (Corrections are only applied to Z) |
| | Y-tracking only |
| | (Corrections are only applied to Y) |
| | Inverted Centerline |
| | (Corrections are applied for -Y/-Z on "outside corners") |
| | Single side left |
| | (Corrections are only applied for Y on the left side. Z is set to zero) |
| | Single side right |
| | (Corrections are only applied for Y on the right side. Z is set to zero) |
| | Adaptive welding to adapt weave width and welding speed based on groove width measurement |
| Limitations | |
| | • The option <i>Weldguide MultiPass</i> and <i>Tracking Interface</i> cannot be used in the same robot task. Either <i>Tracking Interface</i> or <i>Weldguide Multipass</i> can be used. In a MultiMove environment, each task can have one of these options. |
| | • Limited support of track modes. Only the modes listed above are supported. |
| | Only basic support for Single Side-tracking left/right. |

- Aluminum welding and KEMPPI A7 Seam tracking is not supported until further notice.
- In a MultiMove robot, up to two manipulators are supported.
 - Contact your local ABB representative for more information if your robot has more than two manipulators.

Kemppi Tracking Add-In

The KEMPPI A7 Tracking option consists of the following software components:

- Ready to track Interface with a KEMPPI A7 welder
- Graphical Weave and Track data editor
- Graphical widget displaying run-time data
- MultiPass welding support
- Adaptive welding support (ArcCalcX instructions)

For more information on the MultiPass instructions, see Operating manual - Seam tracking with Weldguide III and MultiPass.

Installation of seam tracking function

No additional hardware is needed for the seam tracking function on the IRC5 controller. The Kemppi A7 seam tracking function is software based.

8.3 Software installation

8.3 Software installation

Software installation

See section Software setup on page 18.

66

8.3.1 KEMPPI A7 Tracking Feedback Signal

8.3.1 KEMPPI A7 Tracking Feedback Signal

Feedback signal

The KEMPPI A7 power source provides a feedback signal (analog input) on the fieldbus that is used with the tracking option. If you have chosen the KEMPPI A7 welder add-in package as the welding interface, then the feedback signal is already pre-defined on the fieldbus and configured in the process parameters, ready to use.

If using the *Standard I/O Welder* interface with adapted fieldbus configuration (EIO mapping), then make sure to have the correct signal configuration (mapping) in the system. The feedback signal can have any name (follow your own naming convention). Connect the signal in the process configuration and re-start the controller.

EIO Mapping Seam Tracking Signal

| Parameter | Default value (Old TAST) | Default value (New TAST) |
|--------------|----------------------------------------|----------------------------------------|
| Name | aiWld1SeamTrack | aiWld1SeamTrack (Can be any name) |
| SignalType | Al | Al |
| Device | <i>ioKemppiWld1</i> (your I/O unit) | <i>ioKemppiWld1</i> (your I/O unit) |
| DeviceMap | 72-87 | 72-87 |
| EncType | Unsigned | Unsigned |
| MaxLog | 6500 | 8191 |
| MaxPys | 10 | 10 |
| MaxPhysLimit | 10 | 10 |
| MaxBitVal | 6500 | 8191 |
| MinLogValue | 0 | 0 |
| MinPys | 0 | 0 |
| MinPysLimit | 0 | 0 |
| MinBitVal | 0 | 0 |

Default signal definition

-Name "aiWldlSeamTrack" -SignalType "AI" -Device "ioKemppiWldl" -DeviceMap "72-87"\

- -Label "Kemppi A7 Seam tracking feedback" -EncType "UNSIGNED" -MaxLog 8191 -MaxPhys 10\
- -MaxPhysLimit 10 -MaxBitVal 8191 -Category "Arc_1_R1" -Category "Arc_1_R1"

Old definition based on A7 Firmware < 1.05.00.0

-Name "aiWldlSeamTrack" -SignalType "AI" -Device "ioKemppiWldl" -DeviceMap "72-87"\ -Label "Kemppi A7 Seam tracking feedback" -EncType "UNSIGNED" -MaxLog 8191 -MaxPhys 10\ 8.3.1 KEMPPI A7 Tracking Feedback Signal *Continued*

-MaxPhysLimit 10 -MaxBitVal 6500 -Category "Arc_1_R1" -Category "Arc_1_R1"

8.3.2 System parameters

8.3.2 System parameters

Overview

The KEMPPI A7 Seam Tracking function and settings are automatically activated after the controller is started with the KEMPPI A7 Tracking option. However, the system parameters for the tracking function can be modified using the FlexPendant or RobotStudio.

The parameters belong to the type *KEMPPI A7 Tracking Properties* in the topic *Process*.

For more information about system parameters, see *Technical reference manual - System parameters*.

| 🐌 Instance Editor | | — 🗆 | × |
|--------------------------------------------|-----------------------------|-------------|------|
| Name | Value | Information | |
| Name | ARC1_KEMPPI_TRACKING_T_ROB1 |] | |
| Max Inc.Corr (mm) | 0,5 | | |
| Weave Corr. Delay (Cycles) | 1 | | |
| Ptrn Sync Threshold | 95 | | |
| Stop Process DO (for tracking start error) | v | | |
| Feedback Signal Al | aiWld1SeamTrack × | | |
| LogFile | Kemppi1TrackLog.txt | | |
| LogFile Size | 1000 | | |
| Number of Measurements | 1 | | |
| Max correction warning | ○ TRUE ● FALSE | | |
| Sample on negative Edge | ○ TRUE ● FALSE | | |
| Correction Threshold (mm) | 0,1 | | |
| Correction Threshold Y | 0 | | |
| Correction Threshold Z | 0 | | |
| Sample Time (ms) | 24 | | |
| Simulator Used | ○ TRUE ● FALSE | | |
| TAST Function | Standard v | | |
| TAST Function Value (string) | Standard v | | |
| The changes will not take effect until the | controller is restarted. | | |
| | o | K Ca | ncel |

xx2200001889

8.3.2 System parameters *Continued*

Type KEMPPI A7 Tracking Properties

| Parameter | Data type | Description |
|----------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name | string | The name of the <i>KEMPPI A7 Tracking</i> Equipment Properties. |
| Max Incremental Correction | num | The maximum allowed incremental correc- tions per weave. A good value is 0.5 mm. |
| | | The value can be increased, but depending on the robot type and weave frequency, the system might oscillate and result in bad tracking behavior. Default value: 0.5 mm |
| | | Maximum value: 2 mm |
| Weave Correction Delay | num | Number of weave cycles before correction values are applied to the path. |
| | | Parameter can be used to skip a number of defined cycles if the welding process is unstable in the beginning. |
| | | Minimum value: 1 |
| | | Maximum value: 15 |
| Pattern Sync Threshold | num | The coordination position at the extents of the weaving pattern. It is specified as a per- centage of the width on either side of the weaving center. When weaving is carried out beyond this point, a digital output signal is automatically set. Default value: 95% Minimum value: 0 |
| | | |
| Stop Process DO | signaldo | Not yet implemented. Reserved for future use. |
| Feedback Signal Al | signalai | The name of the current feedback signal as configured on the fieldbus. |
| LogFile | string | The name for the trackog log file. The logfile will be generated and stored in the HOME folder of the robot. |
| Logfile Size | num | The size of the tracklog ring buffer that is the number of sensor measurements that can be buffered during tracking Unit: measurements Default value: 1,000 Minimum value: 1,000 Maximum value: 10,000 |
| Number of Measurements | num | The number of measurements taken at the extents of the weave pattern. |
| | | A mean value is carried out and sent as a correction if more than 1 measurement is taken |
| | | Default value: 1 |
| | | Maximum value: 5 |

8.3.2 System parameters Continued

| Parameter | Data type | Description |
|-------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Max correction warning | bool | If this parameter is enabled, program execu- tion is not interrupted, when the limit for maximum correction, specified in the track- data, is exceeded. Only a warning will be sent. Default value: FALSE |
| Sample on negative edge | bool | If set to TRUE, the current measurement is taken with the falling edge of the dwell bits. This can be used to compensate a delay for the current EIO signal used for tracking Default value: FALSE |
| Correction Threshold | num | The minimum calculated correction in mm that are needed before the corrections are sent to the controller. Unit: mm Default value: 0.1 Minimum value: 0 Maximum value: 2 |
| Correction Threshold Y | num | This as a unit less parameter. It is the minim- um feedback value that need to be exceeded before corrections in Y are applied to the controller. Can be used to filter some noise or other disturbances. A higher value will result in a less sensitive tracking system Default value: 50 Minimum value: 0 Maximum value: 500 |
| Correction Threshold Z | num | This parameter is the minimum feedback value that need to be exceeded before correc- tions in Z are applied to the controller. Can be used to filter some noise or other disturbances. A higher value will result in a less sensitive tracking system Default value: 50 Minimum value: 0 Maximum value: 50 |
| Sample Time | num | Sample time in milliseconds for the correction loop. The value is rounded to a multiple of 24. The minimum value allowed is 24 Unit: milliseconds Default value: 24 Minimum value: 24 Maximum value: 240 |
| Simulator used | bool | Not yet implemented. Reserved for future use. Default value: FALSE |

8.3.2 System parameters *Continued*

| Parameter | Data type | Description |
|---------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TAST Function | string | Select the TAST Firmware version. Standard will use the improved TAST func- tionality. It is not recommended to change this parameter to reverse to the old TAST functionality < Firmware 1.04.00.0 as this not supported. Default: Standard |
8.4 Seam tracking

8.4 Seam tracking

Introduction

A through-the-arc tracking system uses the arc as a sensor to adjust the robot path to the actual location of the part. Measuring the arc voltage and welding current, synchronized with the robot weave pattern, the stick-out length is calculated on both sides and in the middle of the weld. The stick-out length in the middle and the difference between the sides are converted in to robot vertical and horizontal corrections.

It is necessary to understand that there are several tracking modes as well as understanding their relationship within the tracking process.

The tracking methods described below are controlled by the trackdata component track_type. See *trackdata on page 19*.

Preparations



Well-functioning seam tracking with an arc sensor requires that the welding process should be adjusted to be stable, so that the arc length can be significantly changed for seam tracking purposes without destabilizing the process. If there are drastic changes in the weld process (instability) the system will react in a drastic manor (that is, the torch dives into the part or the torch loses the seam an wander all over the welding surface).

The following peripheral conditions prevent seam tracking with an arc sensor:

- Disturbances in the process that interfere too strongly with the length change signals
- De-adjustment of the process during welding (for example, ramps)
- · Inappropriate settings for the welding process

Make sure the welding process is reliable before activating seam tracking.

Geometric weaving shall be used for tracking.

Torch to work tracking (height, Z direction)

In torch-to-work mode, the same contact tip to work length is maintained. The contact tip to work distance is specified as reference data stored in the trackdata. No weaving is required. Measurements are taken at a fixed frequency of 10 Hz.



xx1300000875

73

8 Seam Tracking with A7 MIG Welder 350/450

8.4 Seam tracking *Continued*

Centerline tracking

Centerline tracking is the most commonly used tracking method. For centerline tracking the height corrections are based on measurements taken in the zero crossing of the weave pattern (in the middle of the pattern), while Y corrections are based on measurement made on the sides of the weave pattern. The position of the weld can be adjusted side to side using the bias.



xx1300000876

Side tracking (Y-direction only)

In this track mode only Y corrections are calculated based on measurement made on the sides of the weave pattern. The position of the weld can be adjusted side to side using the bias.



xx2200001890

Inverted centerline tracking

For inverted centerline tracking, make sure to use v-shaped weaving and negative height. See data types weavedata and trackdata in *Application manual - Arc and Arc Sensor*.



Single side tracking (left and right)

The difference between the centerline tracking method and the single side method is that when using the single side method, data from one side of the weave is used and compared with the reference value. No corrections are applied in the Z direction, only in Y direction.

Continues on next page

8.4 Seam tracking Continued

The reference value could also be used as a form of weld penetration level. A higher value for means shorter stick out and higher penetration. A higher penetration level makes the weld move further into the selected side. This method can be used when tracking a lap joint, where the arc might consume one of the sides of the groove.

The position of the weld can be adjusted to the side using the bias component in the data type trackdata.



xx1300000877



The interface only provides basic support for single side tracking. Since the TAST feature is fully software based and no external sensors are used only limited information on either the left or right side of the weaving pattern is available. Problems can occur in such way that the robot TCP moves over the edge of the top metal plate. Once the robot TCP is over the edge, max incremental correction is applied since no side is detected. The robot will stop once the max correction is reached.

If there is a problem or not depends on a lot of factors, the weave width for example. If the weave width is close to the edges, then there is a higher probability of getting problems.

Limits and problems seen with seam tracking

Various peripheral conditions make seam tracking difficult or even impossible. Some of these conditions are:

- · Change of welding wire material such as steel or stainless steel
- Change in wire size
- Extreme Changes to welding parameters such as travel speed, wire freed speed or weave frequency
- · Weld position relative to the joint location
- Used shield Gas
- Wire stick-out and welding process (short arc, spray arc or pulsed arc)
- Change in weave parameters such as frequency or weave type/form
- Material surface condition

8.4 Seam tracking *Continued*

| Recom | menc | lation |
|-------|------|--------|
|-------|------|--------|

Here are some points to consider:

- · Weave width should at least 3 times the welding wire size
- A fillet weld may have a max. enclosed angle of 90° and the leg length must be more than 5 mm
- Weaving frequency should not exceed 3 Hz
- Use Touch sensing prior welding to locate the start of the weld

8.5 Tracking parameters

8.5 Tracking parameters

Gain_Y: horizontal gain

The recommended starting value is 20. This gain is used to increase or decrease the response of the cross-seam (horizontal) tracking. The lower the number the slower the system will respond to a change of seam direction. This variable impacts the stability of weld bead center. If the weld bead center position is oscillating, (snake shape weld bead) decrease this parameter. If the center position is slow to respond to a change in the center position, increase this parameter.

Gain_Z: vertical gain

The recommended starting value is 30. This gain is used to increase or decrease the response of the torch height (vertical) tracking. The lower the number the slower the system will respond to changes to the work surface or geometry. This variable impacts the stability of torch height. If the torch position is oscillating (moving up and down constantly), decrease this parameter. If the torch position is slow to respond to a change in position, increase this parameter.

Track bias

The position of the weld can be adjusted side to side using the bias.

8.6 Best practice

8.6 Best practice

Installation & setup workflow

- 1 Install a system with the KEMPPI A7 Seam Tracking add-in.
- 2 Configure the system to be able to weld.
- 3 Create a simple weld routine with weaving (for example, for a T-joint) and develop your welddata. Use the graphical editor to define weave data.
- 4 Perform a couple of welds to make sure you have a stable weld process.
- 5 At the optional argument \Track and define your trackdata (use the graphical editor). Use centerline tracking.
- 6 Check that the track system is set to 2.
- 7 Block tracking and enable Seam Track Reference value calculation in the widget (Enable button).
- 8 Weld your seam. At the end the widget will present the reference value for the height corrections, and you can update your trackdata by pressing **Update Data**.

Update seam tracking reference

As mentioned above a good way to update the seam tracking reference is to use the **Runtime** widget.

| Page 3 | Manual DE-L-7302296 | 5 | Motors On Stopped (Spe | ed 100%) | • • | X • |
|---------------------------|------------------------|-----------------|-----------------------------------------|----------|----------------------|----------------|
| Runtime Correc Z+ | tions | Seamtra | nck signal values R 0 | т Т | ask [_ROB1 _ | |
| Y+ Z- | Y - | Total Co Y 0 | T D T T T T T T T T T T T T T T T T T T | v | /ersion /.1.00.04 | |
| Active trackdat [name] | ta [type] | [z ref] | [gain y] | [gain z] | [bias] | |
| tr1 | Centerline | 800 | 30 | 30 | 0 | |
| - SeamTrack Ref | erence | | | | | |
| | Enabled | Updat | e data | | | |
| \bigtriangledown | | 9 | | | | |
| A7 MIG R1 | WvTr R1 | ManOp R1 | | | | |
| Production Screen | | | | | | ^{B_1} |
| xx2200001892 | | | | | | |

78

8.6 Best practice Continued

Example: Puls Process with 7.5 m/min Wire feed speed

For this simple example the following parameters have been used together with pulsed arc on an 8 mm T-Joint. 1.2 mm solid wire and shield gas with 18% CO2 was used.

Weave parameter

| Parameter | Value |
|--------------|---------------|
| Weave length | 2.5 mm |
| Weave width | 4 mm |
| Weave shape | Zig zag |
| Weave type | Geometric (0) |
| Frequency | 2 Hz |

Track parameter

| Parameter | Value |
|--------------------|-------|
| Maximum correction | 20 mm |
| Gain Y | 20 |
| Gain Z | 30 |
| Track Bias | 0 |
| Reference Value | 836 |

Weld parameter

| Parameter | Value |
|-------------------|------------|
| Weldspeed | 5 mm/s |
| Wirefeed speed | 7.5 m/min |
| Stick out | 20 mm |
| Current Reference | 233 Ampere |
| Sheet Size | 8 mm |

No Wise Function used.

Simple RAPID example

GRAPHIC

8.6 Best practice *Continued*

Active tracking

The robtargets for the End position have been offset by approximately 20 mm to the left right and then welded with active tracking. The path has been corrected and is placed in the center of the groove.

| Description | Position |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Start point in correct position and End point with an offset. The robot has done the corrections and got pushed into the joint following to joint to the end position. Corrections have been applied in Y/Z (centerline tracking). | <image/> <image/> |
| The robot has done the corrections and got pushed into the joint following to joint to the end position. Corrections have been applied in Y/Z (centerline tracking). | |

8.7 Runtime widget

8.7 Runtime widget

Introduction

The tracking runtime widget can be used to get the reference value for the height corrections. In addition, it has useful information of the current applied corrections and the accumulated corrections as well as present trackdata values. The widget is shown on page 3 in the *Production Screen* application.

| Page 1 | Auto DE-L-7302296 | | Motors Or Stopped (| n Speed 100% | • • • • • |
|----------------------------------------|-----------------------------------|-----------------------|------------------------|-----------------|--------------------------------|
| - Runtime Corre Z+ | ctions | Curren | t (A) 0 R | 0 | Task |
| Y+ Z- | Y- | – Total C Y | orrections 0 Z | 0 | Version EWM v.1.00.00 |
| Trackdata: trE [type] Centerline | WM1 [gain y] 25 ence (A) | [gain z] 20 | [bias] O | wel | ddata: wd1 [current] 246 |
| | Enable | Update | e data | - | |
| P | <u>^</u> √, | | | | |
| Arc Production Screen | WvTr R1 | | | | ®@ |

xx2200001895

The following data is presented in the runtime widget:

- Task selection to select the active welding robot.
- Currently applied corrections for Y and Z direction [mm].
- Feedback value from the welder taken on the left/right side of the weave pattern.
- Total corrections in seam coordinate system per weld [mm].
- Active trackdata of current weld with information about trackdata name, type (center line, Height, Y only), Z reference, gain y, gain z, and bias.
- SeamTrack Reference calculation. Tap Enable to start collecting data from the weld. Once the weld is finished, the SeamTrack Reference value will be green and the text will say Complete. If the Update data button is pressed, the current z ref value in the active trackdata will be updated. Tap Enable to disable the SeamTrack Reference calculations.

8.8 Weave and track data editor interface

8.8 Weave and track data editor interface

Overview

The tracking option provides a convenient way to edit weavedata and trackdata using a graphical interface (editor). The editor can be started from *Production Screen.* Tap WvTrR1 to launch the editor for robot 1. Each welding robot has its own editor.



xx2200001896

Weave editor

The Weave data editor tab presents the current data where the program pointer is. Data can only be changed in manual mode. Manual mode is indicated with a green status bar.

| 59 ArcLStart * s | Manual DE-L-73022 m2 wd2 \Wea | 296 ve:=wv1 \Trac | Guard Stop Stopped (Spe k:=tr1 \SeamNa | eed 100%) me:="Seam1"; | 3 X |
|------------------------|-------------------------------------|----------------------|----------------------------------------------|---------------------------|------------|
| <mkemppi>PER</mkemppi> | 6 wv1:=[1,0,2. | 5,4,0,0,0,0,0,0,0 | ,0,0,0,0] | | |
| We | ld | We | ave | Analog 1 | [rack |
| Shape | Zig-zag (1) | | Type Geom | etric (0) | |
| Length | < 2. | 5 > mm | Direction | 0 d | eg |
| Width | < | 4 > mm | Tilt | 0 d | eg |
| Height | < | 0 > mm | Orientation | 0 d | eg |
| Bias | < | 0 > mm | Store Path | | |
| Dwell Left | | 0 mm | | | |
| Dwell Center | | 0 mm | Result Frequency | 2 Hz | |
| Dwell Right | | 0 mm | | | 1.0.190616 |
| 0 | | ŕ | ₩. | | |
| Production Screen | | | | | |

xx2200001897

With the **Weave data** editor, it is possible to edit the current weave data. For more information and a description of the parameters, see *Application manual - Arc and Arc Sensor*.

8.8 Weave and track data editor interface *Continued*

Track data editor

The **Analog Track** data editor tab presents the current data where the program pointer is. Data can only be changed in manual mode. Manual mode is indicated with a green status bar.

| Weld: wd1, Weave | Manual DE-L-73022 :: wv1, Track | 296 : trEWM1 | | Guard Stop Stopped (Spe | ed 100%) | | X |
|---------------------------|---------------------------------------|-----------------|--------------|----------------------------|------------|-----------|------------------|
| <mpart_1>TASK F</mpart_1> | PERS trEWM1 | l:=[2,FALS | SE,30,[0,25, | 20,0,0,0,0,0 | ,0],[0,0,0 |),0,0,0,0 | 11 |
| Weld | | | Weave | | A | nalog T | rack |
| Тур | Centerline | e (0) | | | | | |
| Max corr | < | 30 > | mm | | | | |
| gain_y | < | 25 > | | | | | |
| gain_z | < | 20 > | | | | | |
| Track Bias | < | 0 > | | Store Patł | ו | | |
| | | | | - Result | | | |
| | | | | Freque | ncy | 2.33 | Hz 1.0.200508 |
| 0 | | | | | | | |
| Production Window | oduction creen | | | | | | |

xx2200001898

With the help of the track data editor, it is possible to edit the current track data. The following parameters can be changed/set:

| Parameter | Value |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Туре | Select the track type. The following types are supported: • Center line • Height Only (Torch to work) • Y-Corrections only • Inverted center line • Single Side R + L |
| Max correction | The maximum allowed path correction. If the TCP is offset more than max_corr by path corrections, a track error is reported and program execution is stopped (depending on the boolean flag, <i>MaxCorrWarning</i>). |
| Gain Y | The <i>gain_y</i> parameter defines how big of a correction is sent to the robot. The higher the number, the faster the system corrects. The range of this parameter is from 1 to 100. Initial starting values for this parameter de- pend on weave size. Start with 30 for most weave widths and 5 for very small weave widths. |
| Gain Z | The <i>gain_z</i> parameter defines how big of a correction is sent to the robot. The higher the number the faster the system corrects. The range of this parameter is from 1 to 100. Initial starting values for this parameter de- pend on weave size. Start with 30 for most weave widths and 5 for very small weave widths. |

8.8 Weave and track data editor interface *Continued*

| Parameter | Value |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Track Bias | The bias parameter is used to move the TCP in the seam y direction to bias (offset) one side of the joint or the other. The range for this parameter is from -50 to +50 where +50 is the highest amount of bias achievable in the plus Y direction of the seam coordinates. Used in center line tracking only. |
| Store path | A checkbox to enable the store_path component in trackdata. Used for saving the path with <i>MultiPass</i> . |

9 The Kemppi A7 Logbook Viewer

Introduction

| Simong Packet 0.0.03 10 30 244 from errly number Composition Simong Picket Simong Picket Simong Picket Simong Picket Simong Picket Simong Picket Picke | obotA | pps Ansicht | 1 A7 Lo | gbook Viewer | 1.0.0 X | | | | | | | 1 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------|-------------|--------------|------------------------|----------|----|---|---------------------|-----------------|--------|----|
| P addses 10 ds 190 00 Entites to download Sub the metry number Entites to download Dist Dist <thdist< th=""> Dist Dist <t< td=""><td>Settings</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>A7 Info</td><td></td><td></td><td></td></t<></thdist<> | Settings | | | | | | | | A7 Info | | | |
| Uber Effetes to deveload 200 Effetes to deveload 200 Effetes to deveload 201 Effetes to deveload 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 201 </td <td>IP addr</td> <td>10.</td> <td>49.190.109</td> <td>Start fro</td> <td>om entry number</td> <td></td> <td>Ē</td> <td></td> <td>Serial Number:</td> <td>PSNK0176705</td> <td>1000</td> <td></td> | IP addr | 10. | 49.190.109 | Start fro | om entry number | | Ē | | Serial Number: | PSNK0176705 | 1000 | |
| User Data Work Control Data Work Data Work <thdata th="" work<=""> <thdata td="" wo<=""><td></td><td></td><td></td><td>Entrine</td><td>to download 200</td><td>–</td><td>Eġ</td><td>Ш</td><td>Seller Homes</td><td>0.000</td><td>100.01</td><td>L,</td></thdata></thdata> | | | | Entrine | to download 200 | – | Eġ | Ш | Seller Homes | 0.000 | 100.01 | L, |
| PNCGe Own/I Contain PREDERINA VLAB D Date Time User Name Entry Type Management | User | | | C. C. C. | | _ | | _ | outware version. | 0.2.63 | | |
| Dit Date Unit Name Unit Name Entry Type A Manup of Annell 281 2220-01-22 13-13-33< | PIN Cor | ie | | _ | | Show Al | ~ | | Location: | FRIEDBERG AW LA | 8 | |
| Skill Skill Skill Diraking Skill Skill Skill Skill Skill Skill Skill Skill Skill <td>ID</td> <td>Date</td> <td>Time</td> <td>User Name</td> <td>Entry Type</td> <td></td> <td></td> <td>^</td> <td>Memory channel</td> <td></td> <td></td> <td></td> | ID | Date | Time | User Name | Entry Type | | | ^ | Memory channel | | | |
| Name Name Form 13 Modes Modes Name Name Verding store Average current Average current Name Name Verding store Average current Average current Name Name Verding store Average current Average current Name Verding store Average current Average current Average current Name Verding store Modes Average current Average current Name Name Modes Average current Average current Name Modes Modes Average current Average current Name Modes Modes Average current Average current Name Modes Modes Average curent Average current < | 2262 | 2022-08-23 | 16:51:44 | | Error 132 | | | | Duration | | | |
| 2020 222-04-22 13-8.50 Admin Weining stopped Average curvant 2220 13-824 Admin Weining stopped Average curvants 2220 13-834 Admin Weining stopped Average curvants 2230 2220-022 13-834 Admin Weining stopped Average curvants 2240 2220-022 13-834 Admin Weining stopped Average curvants 2250 2220-022 13-834 Admin Memory charants Average curvants 2250 2220-022 13-834 Admin Revolution stopped Average curvants 2260 220-022 13-845 Admin Revolution stopped Average curvants 2261 220-022 13-845 Admin Revolution stopped Average curvants 2262 13-845 Admin Veining stopped Average curvants 2262 13-845 Admin Veining stopped Average curvants 2274 2220-848 | 2261 | 2022-08-22 | 13:47:28 | Admin | Error 132 | | | | Motor current | | | |
| 2329 2329 13 4. Admin Weining started Average collage 2329 2220-12 13 13 Main Weining started Average collage 2329 2220-12 13 13 Main Weining started Average collage 2329 2220-12 13 13 Main Weining started Average collage 2329 2220-12 13 13 Main Weining started Average collage 233 220-12 13 13 Main Weining started Average collage 233 220-12 13 Main Weining started Average collage 234 220-12 13 Main Weining started Average collage 235 220-12 13 Main Memory dwanted Heiner 240 220-12 13 Main Robot is offine Heiner 241 220-12 13 13 Main Weining started Heiner 242 220-12 13 13 Main Weining started Heiner 242 220-13 13 13 Main Weining started Heiner 243 220-13 13 13 | 2260 | 2022-08-22 | 13:43:50 | Admin | Welding stopped | | | | Average current | | | |
| 238 232 22-43-22 13-14-26 Admin Weiding stopped 238 222-24-22 13-55.5 Admin Weiding stopped 238 222-24-22 13-55.5 Admin Weiding stopped 238 222-24-22 13-55.6 Admin Weiding stopped 238 222-24-22 13-55.6 Admin Weiding stopped 238 222-04-22 13-56.6 Admin Weiding stopped Average at: voltage 238 222-04-22 13-56.4 Admin Weiding stopped Admin 238 222-04-22 13-56.4 Admin Stopped Admin 238 222-04-22 13-56.4 Admin Revery dwined thanged Admin 238 222-04-12 13-56.4 Admin Revery dwined thanged Admin 238 222-04-12 13-56.4 Admin Weiding stopped Admin 244 222-04-14 13-156.4 Admin Weiding stopped Admin 239 222-04-15 13-06.6 | 2259 | 2022-08-22 | 13:43:41 | Admin | Welding started | | | | Average voltage | | | |
| 2327 2322-04-22 13-55.0 Admin Weiding started Average ar: voltage 2325 2222-04-22 13-95.0 Admin Weiding started Average ar: voltage 2325 2222-04-22 13-95.0 Admin Weiding started Average ar: voltage 2326 2222-04-22 13-95.0 Admin Weiding started Average ar: voltage 2328 2222-01-22 13-95.0 Admin Weiding started Average ar: voltage 2329 2222-01-22 13-95.0 Admin Semudicin started Average ar: voltage 2339 2220-01-22 13-95.0 Admin Semudicin started Average ar: voltage 2340 2220-01-22 13-95.0 Admin Robot in office Average ar: voltage 2341 2220-01-22 13-95.0 Admin Weiding storged Average ar: voltage 2342 2220-01-13 13-15.0 Admin Weiding storged Average ar: voltage 2342 2220-01-13 13-15.0 Admin Weiding storged Average ar: voltag | 2258 | 2022-08-22 | 13:42:59 | Admin | Welding stopped | | | | Average power | | | |
| 2326 2322 Al-22 13355 A Admin Weiding stopped 2325 2322-04-22 13345 A Admin Weiding stopped 2326 2322-04-22 13345 A Admin Weiding stopped 2326 2322-04-22 13345 A Admin Weiding stopped 2328 2322-04-22 13345 A Admin Stopped 2328 2322-04-22 13345 A Admin Stopped 2329 13345 I Admin Stopped Stopped 2329 13345 I Admin Revery stored thanged Stopped 2329 13345 I Admin Revery stored thanged Stopped 2329 13345 I Admin Revery stored thanged Stopped 2329 13345 I Admin Meining stopped Stopped 234 2320-014 I 13153 I Admin Weising started 234 2320-014 I 13153 I Admin Weising started 234 2320-014 I 13056 I Admin <td< td=""><td>2257</td><td>2022-08-22</td><td>13:42:50</td><td>Admin</td><td>Welding started</td><td></td><td></td><td></td><td>Average arc voltage</td><td>9</td><td></td><td></td></td<> | 2257 | 2022-08-22 | 13:42:50 | Admin | Welding started | | | | Average arc voltage | 9 | | |
| 2355 222-24-22 133-84 Admin Weiding started 2351 222-24-22 13-35-66 Admin Weiding started 2353 222-24-22 13-35-66 Admin Weiding started 2353 222-24-22 13-35-66 Admin Simulation topped 236 222-24-22 13-35-76 Admin Memory channel chapped 236 222-24-22 13-35-81 Admin Memory channel chapped 236 222-24-22 13-35-81 Admin Memory channel chapped 236 222-24-22 13-32-41 Memory channel chapped 236 222-24-22 13-32-44 Memory channel chapped 236 222-24-12 13-13-45 Admin Weiding stopped 237 222-24-13 13-13-5 Admin Weiding stopped 238 222-24-13 13-13-6 Admin Weiding stopped 238 222-24-13 13-13-6 Admin Weiding storped 238 222-24-13 13-13-6 Admin | 2256 | 2022-08-22 | 13:39:58 | Admin | Welding stopped | | | | Average arc power | | | |
| 2348 222-04-22 13-56-9 Admin Weiding staged 2352 222-04-22 13-54-9 Admin Staded 2352 222-04-22 13-54-9 Admin Staded 2352 222-04-22 13-54-9 Admin Staded 236 222-04-22 13-54-9 Admin Stadeg 236 222-04-22 13-54-9 Admin Revery dhaned full 236 222-04-22 13-54-9 Admin Revery dhaned full 246 222-04-22 13-54-9 Admin Revery dhaned full 247 220-04-21 13-52-9 Admin Meenry dhaned full 248 222-04-12 13-52-9 Admin Meenry dhaned full 244 222-04-13 13-52-9 Admin Veiding staded 244 222-04-14 13-52-9 Admin Veiding staded 242 222-04-14 13-59-9 Admin Veiding staded 242 222-04-14 13-59-9 Admin Veiding staded | 2255 | 2022-08-22 | 13:39:49 | Admin | Welding started | | | | | | | |
| 233 222 44-22 13-85 a Admin Weining started 234 222 44-22 13-84 a Admin Simulation stoped 235 222 44-22 13-84 a Admin Simulation stoped 236 222 44-22 13-84 a Admin Memory channel changed 236 222 44-22 13-84 a Admin Memory channel changed 247 222 44-22 13-24 b Memory channel changed Memory channel changed 247 222 44-12 13-12 b Memory channel changed Rodet is offine 248 222 44-12 13-13 b Admin Weining started Memory channel changed 247 222 41-13 13-13 b Admin Weining started Memory channel changed 248 222 41-13 13-13 b Admin Weining started Memory channel changed 241 222 41-13 13-105 d Admin Weining started Memory channel changed 252 222 41-13 13-064 d Admin Weining started Memory channel changed <tr< td=""><td>2254</td><td>2022-08-22</td><td>13:36:36</td><td>Admin</td><td>Welding stopped</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr<> | 2254 | 2022-08-22 | 13:36:36 | Admin | Welding stopped | | | | | | | |
| 2322 2322 al: 13457 Admin Simulation stepped 2330 2322-032 13454 Admin Simulation steled 2340 2322-032 13454 Admin Ready and indice 2340 2322-032 13454 Admin Ready and indice 2341 2322-032 13545 Admin Ready and indice 2342 2322-032 132344 Meenry drawnel dhanged 2345 2322-032 13244 Meenry drawnel dhanged 2346 2322-032 13243 Admin 2347 2322-031 13143 Admin 2348 2322-031 13153 Admin 2349 2322-031 13153 Admin Veiding starkef 2341 2322-031 13055 Admin Veiding starkef 2342 2322-031 130454 Admin Veiding starkef 2342 2322-031 130454 Admin Veiding starkef 2352 2322-031 130454 Admin Veiding starkef | 2253 | 2022-08-22 | 13:36:30 | Admin | Welding started | | | | | | | |
| Display Display Addm Simulation State(d) Display 13:45:1 Admin Memory Channel Changed Display 13:45:1 Admin Memory Channel Changed Display 13:25:41 Memory Channel Changed Display 13:25:42 Memory Channel Changed Display 13:25:44 Memory Channel Changed Display 13:45:1 Admin Weiting state(d) Display 13:45:1 Admin Weiting state(d) Display 13:45:1 Admin Weiting state(d) Display 13:15:1 Admin Weiting state(d) Display 13:10:1 Admin Weiting state(d) Display 13:00:5 | 2252 | 2022-08-22 | 13:34:57 | Admin | Simulation stopped | | | | | | | |
| 2020 2020-032 13-54.3 Admin Memory channel changed 2020 2020-032 13-54.3 Adminey Channel Changed 2020 12-23.4 Memory channel Changed 2020 13-123.4 Memory channel Changed 2020 13-123.4 Memory channel Changed 2020 13-123.4 Memory channel Changed 2020 13-134.4 Memory channel Changed 2020 13-131.4 Admin Weiling Inford 2020 13-131.4 Admin Weiling Inford 2020 13-131.4 Admin Weiling Inford 2020 13-135.4 Admin Weiling Inford 2020 13-136.4 Admin Weiling Inford 2020 13-143.4 Admin Weiling Inford 2020 13-144.4 < | 2251 | 2022-08-22 | 13:34:52 | Admin | Simulation started | | | | | | | |
| 2329 2220-322 133-54 Admin Rebody shared shared shared 247 2202-422 132-34 Memory channel shared Memory channel shared 247 2202-422 132-34 Memory channel shared Memory channel shared 248 2202-412 132-34 Memory channel shared Memory channel shared 248 2202-413 131-50 Admin Weining shared 249 2202-413 131-51 Admin Weining shared 241 2202-413 131-51 Admin Weining shared 242 2202-413 131-51 Admin Weining shared 242 2202-413 130-65 Admin Weining shared 241 2202-413 130-65 Admin Weining shared 242 2202-413 130-65 Admin Weining shared 242 2202-413 130-64 Admin Weining shared 242 2202-413 130-64 Admin Weining shared 242 2202-413 130-64 </td <td>2250</td> <td>2022-08-22</td> <td>13:34:51</td> <td>Admin</td> <td>Memory channel changed</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> | 2250 | 2022-08-22 | 13:34:51 | Admin | Memory channel changed | | | | | | | |
| 2326 2322 v1-32 13234 v1 Menay channel changed 2346 2322-01-2 13234 v1 Menay channel changed 2346 2322-01-2 13234 v1 Menay channel changed 2347 2322-01-2 13154 v1 Menay channel changed 2348 2322-01-1 13153 v1 Menay channel changed 2349 2322-01-1 13153 v1 Weiding disped 2341 2322-01-1 13153 v1 Weiding disped 2342 2322-01-1 13153 v1 Weiding disped 2341 2322-01-1 13153 v1 Menay v1 2342 2322-01-1 13045 v1 Menay v1 2371 2322-01-1 13045 v1 Weiding disped 2372 2322-01-1 13045 v1 Weiding disped 2332 2322-01-1 13045 v1 Weiding disped 2332 2322-01-1 13034 v1 Weiding disped 2332 2322-01-1 13034 v1 Weiding disped 2332 2322-01-1 13034 v1 Menay disped <t< td=""><td>2249</td><td>2022-08-22</td><td>13:34:51</td><td>Admin</td><td>Robot is online</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<> | 2249 | 2022-08-22 | 13:34:51 | Admin | Robot is online | | | | | | | |
| 2327 2224.3.2.2 12.3.2.4.1 Memory channel dhagned 2326 2322.4.3.2.2 13.3.5.4. Robel of Imfer 2387 2322.4.3.2.2 13.1.5.2.2. Admin Usepped 2382 2322.4.3.2.1 13.1.5.2.0. Admin Usepped 2382 2322.4.3.1.2 13.1.5.2.0. Admin Usepped 2382 2322.4.3.1.2 13.0.6.3. Admin Usepped 2382 2322.4.3.1.2 13.0.6.5. Admin Usepped 2382 2322.4.3.1.2 13.0.6.5. Admin Usepped 2392 2322.4.3.1.2 13.0.6.5. Admin Usepped 2392 2322.4.3.1.2 13.0.6.5. Admin Usepped 2392 2322.4.3.1.2 13.0.6.4. Memory Usepped 2392 2322.4.3.1.2 13.0.6.4. Memory Usepped 2392 2322.4.3.1.2 13.0.6.4. Memory Usepped 2312 2322.4.3.1.2 13.0.6.4. Memory Usepped 2322 2322.4.3.1.2 13.0.6.4. Memory Usepped 2322 2322.4.3.1.3 13.0.4. | 2248 | 2022-08-22 | 13:23:44 | | Memory channel changed | | | | | | | |
| 2026 2022-01-22 2-13-23-14 Robel is offme 2024 2022-01-81 31-50-24 Kerling thosped 214 2022-01-81 31-51-55 Admin Weiding thosped 214 2022-01-81 31-50-56 Admin Weiding thosped 212 2022-01-81 13-50-56 Admin Weiding thosped 2129 2022-01-81 13-50-54 Admin Weiding thosped 2129 2022-01-81 13-69-44 Admin Weiding thosped 2120 2022-01-81 13-01-44 Admin Standaton th | 2247 | 2022-08-22 | 13:23:41 | | Memory channel changed | | | | | | | |
| 2026 2024-08.10 214-09.24 2024 2024-08.10 313.02 Admin Weiding stopped 2034 2024-08.10 313.02 Admin Weiding stopped 2045 2024-08.10 313.02 Admin Weiding stored 2042 2022-08.11 313.015 Admin Weiding stored 2042 2022-08.11 13.065 Admin Weiding stored 2042 2022-08.11 13.065 Admin Weiding stored 2029 2022-08.11 13.064 Admin Weiding stored 2029 2022-08.11 13.045 Admin Stopped 2022 2022-08.11 13.045 Admin Stopped 2022-08.11 <td>2246</td> <td>2022-08-22</td> <td>हे 13:23:41</td> <td></td> <td>Robot is offline</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> | 2246 | 2022-08-22 | हे 13:23:41 | | Robot is offline | | | | | | | |
| 2244 2224 131252 Admin Weiding stopped 2242 2222-01-18 131155 Admin Weiding stopped 2242 2222-01-18 131155 Admin Weiding stopped 2242 2222-01-18 131064 Admin Weiding stopped 2242 2222-01-18 13064 Admin Weiding stopped 2242 2222-01-18 13064 Admin Weiding stopped 2252 2222-01-18 13064 Admin Weiding stopped 2252 2222-01-18 130451 Admin Weiding stopped 2252 2222-01-18 130451 Admin Weiding stopped 2252 2222-01-18 130454 Admin Weiding stopped 2252 2222-01-18 130454 Admin Weiding stopped 2252 2222-01-18 130454 Admin Stoution stated 2252 2222-01-18 130454 Admin Meiory stormed thonged 2252 2222-01-18 124454 Admin | 2245 | 2022-08-18 | 13:40:34 | | Error 132 | | | | | | | |
| 233 2220-31.8 131.15.5 Admin Weiding started 2242 2220-31.8 1310.31 Admin Weiding started 2342 2220-31.8 1310.85 Admin Weiding started 2342 2220-31.8 130.65.9 Admin Weiding started 2329 2220-31.8 130.65.9 Admin Weiding started 2329 2220-31.8 130.65.7 Admin Weiding started 2329 2220-31.8 130.65.7 Admin Weiding started 2329 2220-31.8 130.65.7 Admin Weiding started 2329 2220-31.8 130.45.7 Admin Weiding started 2329 2220-31.8 130.45.7 Admin Simulation started 232 2220-31.8 130.93.7 Admin Red/or early day 232 2220-31.8 130.93.7 Admin Red/or early day 232 2220-31.8 120.93.7 Admin Memory day 232 2220-31.8 121.41.7 Admin | 2244 | 2022-08-18 | 13:12:02 | Admin | Welding stopped | | | | | | | |
| 242 2022-01-18 13/013 Admin Weiding stopped 242 2022-01-18 13/064 Admin Weiding stopped 244 2022-01-18 13/065 Admin Weiding stopped 245 2022-01-18 13/064 Admin Weiding stopped 2249 2022-01-18 13/064 Admin Weiding stopped 2239 2022-01-18 13/064 Admin Weiding stopped 2230 2022-01-18 13/045 Admin Weiding stopped 2231 2022-01-18 13/045 Admin Weiding stopped 2232 2022-01-18 13/045 Admin Stopped 2232 12/02-01-18 13/045 Admin Meony channel dhosped 2332 2022-01-18 13/045 Admin | 2243 | 2022-08-18 | 13:11:55 | Admin | Welding started | | | | | | | |
| 2241 2220-01-18 131006 Admin Weiding started 2220 2220-01-18 130645 Admin Weiding started 2220 2220-01-18 130645 Admin Weiding started 2220 130644 Admin Weiding started 2220 130643 Admin Weiding started 2220 130643 Admin Weiding started 2220 130643 Admin Weiding started 2220 130443 Admin Weiding started 2230 220-01-8 130443 Admin Weiding started 2232 220-01-8 130454 Admin Started 2232 220-01-8 130454 Admin Started 2232 220-01-8 130454 Admin Redot in started 2232 220-01-8 120454 Admin Redot in started 2232 220-01-8 124417 Admin Meeory dramel dranged 2232 <td>2242</td> <td>2022-08-18</td> <td>13:10:13</td> <td>Admin</td> <td>Welding stopped</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> | 2242 | 2022-08-18 | 13:10:13 | Admin | Welding stopped | | | | | | | |
| 2340 2220-01-18 13065.0 Admin Weiding stopped 2220 2022-01-18 13064.4 Admin Weiding stopped 2220 2022-01-18 13064.7 Admin Weiding stopped 2220 2022-01-18 13063.7 Admin Weiding stopped 2220 13063.1 Admin Weiding stopped 2220 13063.1 Admin Weiding stopped 2220 13064.1 Admin Weiding stopped 2220 13064.1 Admin Weiding stopped 2230 2022-01-18 13043.4 Admin Weiding stopped 2230 2022-01-18 13043.4 Admin Simulation stopped 2231 2022-01-18 13033.4 Admin Remory channel changed 2232 2022-01-18 1244.9 Admin Memory channel changed 2230 1222-01-12 1244.9 Admin Memory channel changed 2330 2022-01-18 1244.9 Admin Memory channet changed 2340 <td>2241</td> <td>2022-08-18</td> <td>13:10:06</td> <td>Admin</td> <td>Welding started</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> | 2241 | 2022-08-18 | 13:10:06 | Admin | Welding started | | | | | | | |
| 2229 2220-03.18 130644 Admin Weiding started 2227 2220-03.18 130643 Admin Weiding started 2227 2220-03.18 130643 Admin Weiding started 2228 2220-03.18 130643 Admin Weiding started 2255 2220-03.18 130643 Admin Weiding started 2254 2220-03.18 130643 Admin Weiding started 2252 2220-03.18 130643 Admin Weiding started 2238 2202-03.18 130843 Admin Started 2232 2202-03.18 130834 Admin Baddrin Staped 2232 2202-03.18 130834 Admin Baddrin Started 2232 2202-03.18 120834 Admin Memory channel changed 2232 2220-03.18 1214417 Admin Memory channel changed 2232 2202-03.18 124634 Admin Free started 2232 2202-03.18 124635 Admin <td>2240</td> <td>2022-08-18</td> <td>13:06:50</td> <td>Admin</td> <td>Welding stopped</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> | 2240 | 2022-08-18 | 13:06:50 | Admin | Welding stopped | | | | | | | |
| 2020 2020-18 106637 Admin Weiding stopped 2020 106631 Admin Weiding stopped 2020 106631 Admin Weiding stopped 2020 106431 Admin Weiding stopped 2020 106441 Admin Weiding stopped 2021 102441 Admin Weiding stopped 2023 102444 Admin Simulation stopped 2023 102454 Admin Simulation stopped 2023 102454 Admin Simulation stopped 2023 102454 Islo393 Admin Simulation stopped 2023 102454 10453 Admin Remover Admin standed 2023 102454 12443 Admin Memory Admin standed 2023 102454 12449 Admin Memory Admin standed 2023 102454 12449 Admin Memory Admin standed 2024 124549 Admin Technol memory admin standed 2024 <t< td=""><td>2239</td><td>2022-08-18</td><td>13:06:44</td><td>Admin</td><td>Welding started</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<> | 2239 | 2022-08-18 | 13:06:44 | Admin | Welding started | | | | | | | |
| 2207 2202-03.8 130633.4 Admin Weiding started 2205 2202-03.8 130643.4 Admin Weiding started 2205 2202-03.8 130643.4 Admin Weiding started 2205 2202-03.8 130643.4 Admin Weiding started 2203 2202-03.8 130834.4 Admin Started 2203 2202-03.8 130839.4 Admin Reduction started 2203 2202-03.8 120839.4 Admin Meeory channel changed 2203 2202-03.8 121439.4 Admin Meeory channel changed 2203 2202-03.8 124439.4 Admin Meeory channel changed 2203 2202-03.8 124493.4 Admin Free rays 2203 124053.4 Admin Free rays Texture changed 2203 124053.4 Admin Free rays Texture changed 2203 124053.4 Admin Free rays of rays Texture changed | 2238 | 2022-08-18 | 13:06:37 | Admin | Welding stopped | | | | | | | |
| 2226 1232 12344.3 Admin Weiding stopped 2226 123 13044.3 Admin Weiding stopped 2236 1222.01.81 13045.4 Admin Struktion stopped 2236 1222.01.81 1303.93 Admin Struktion stopped 2232 2022.01.81 1303.93 Admin Struktion storped 2232 2022.01.81 1303.93 Admin Reburg to started 2232 2022.01.81 124.13 Admin Memory channel changed 2230 2022.01.81 124.141 Admin Memory channel changed 2230 2022.01.81 124.143 Admin Memory channel changed 2302 2022.01.81 124.94 Admin Memory channel changed 2302 2022.01.81 124.94 Admin Terustrase 2301 2022.01.81 124.95 Admin Terustrase 2302 2022.01.81 124.95 Admin Terustrase 2303 202.01.81 14.95.95 | 2237 | 2022-08-18 | 13:06:31 | Admin | Welding started | | | | | | | |
| 2225 2220-01-30 130-64.4 Admin Weinding started 2232 2220-01-30 130-39.4 Admin Simulation started 2232 2220-01-30 130-39.4 Admin Reduction started 2232 2220-01-30 130-39.4 Admin Reduction started 2232 2220-01-30 121-43.9 Admin Meeory dhannel changed 2232 2220-01-30 121-44.7 Admin Meeory dhannel changed 2232 2220-01-30 121-44.7 Admin Teoring off 2332 2220-01-30 124-37.4 Admin Teoring off | 2236 | 2022-08-18 | 13:04:43 | Admin | Welding stopped | | | | | | | |
| 2244 2022 de 18 110/93 A Admin Simulation stopped 223 2022 de 18 110/93 A Admin Simulation started 2232 2022 de 18 110/93 A Admin Reboti is online 2232 2022 de 18 12/13 A Admin Reboti is online 2232 2022 de 18 12/14 A Admin Memory channel changed 2230 2022 de 18 12/14 A Admin Memory channel changed 2230 2022 de 18 12/14 A Admin Femory channel changed 224 202 de 18 12/14 S Admin Femory channel changed 224 202 de 18 12/14 S Admin Femory channel changed 226 202 de 18 12/14 S Admin Femory channel changed 226 202 de 18 12/14 S Admin Tenuty memory channel changed 227 202 de 18 12/14 S Admin Tenuty memory channel changed 228 202 de 18 14/14 S Admin Tenuty memory channel changed | 2235 | 2022-08-18 | 13:04:41 | Admin | Welding started | | | | | | | |
| Z023 Z022-08-18 13/03/9 Admin Simulation started Z022-08-18 13/03/8 Admin Robet is only Z021 2022-08-18 13/03/8 Admin Meesing charanted charged Z022 2022-08-18 12/44/9 Admin Meesing charanted charged Z022 2022-08-18 12/44/9 Admin Meesing character charged Z022 2022-08-18 12/46/9 Admin For thread only Z022 11/46/3 Admin For thread off For thread off | 2234 | 2022-08-18 | 13:03:45 | Admin | Simulation stopped | | | | | | | |
| 2222 2222 Al-18 12/038 Admin Robot is online 2212 2222 Al-18 12/414 Admin Memory channel changed 2220 2222 Al-18 12/414 Admin Memory channel changed 2220 2222 Al-18 12/414 Admin Memory channel changed 2230 2222 Al-18 12/414 Admin Memory channel changed 224 2220 Al-18 12/455 Admin Free1323 2230 12/454 14/455 Admin Free1323 224 12/454 14/455 Admin Terrorb reming off 228 12/454 14/455 Admin Terrorb reming off | 2233 | 2022-08-18 | 13:03:39 | Admin | Simulation started | | | | | | | |
| Z211 2022-08-18 12:14:19 Admin Memory channel changed Z230 2022-08-18 12:14:17 Admin Memory channel changed Z230 2022-08-18 12:04:19 Admin Memory channel changed Z230 2022-08-18 12:04:19 Admin Error 13:20 Z230 2022-08-18 11:04:59 Admin Terror 13:20 Z230 11:14:35 Admin Terror 13:20 Terror 13:20 Z230 11:14:35 Admin Terror 13:20 Terror 13:20 | 2232 | 2022-08-18 | 13:03:38 | Admin | Robot is online | | | | | | | |
| 2230 2022-04-18 12.14.17 Admin Memory channel changed 2230 2022-04.18 12.04.09 Admin Free 13.22 2230 2022-04.18 12.04.09 Admin Free 13.22 2238 2022-04.18 11.40.59 Admin Torush reming off 2237 2023 11.40.59 Admin Torush reming off | 2231 | 2022-08-18 | 12:14:19 | Admin | Memory channel changed | | | | | | | |
| 2229 2022-08-18 12:06-59 Admin Error.132 2228 2022-06-18 11:46-53 Admin Touch-sensing off | 2230 | 2022-08-18 | 12:14:17 | Admin | Memory channel changed | | | | | | | |
| 2228 2022-08-18 11:40:53 Admin Touch sensing off | 2229 | 2022-08-18 | 12:06:59 | Admin | Error 132 | | | | | | | |
| 2227 2022 09 18 11:40-50 Admin Tauch cancing on | 2228 | 2022-08-18 | 11:40:53 | Admin | Touch sensing off | | | | | | | |
| 2227 2022-06-18 11:40:50 Admin Touch sensing on | 2227 | 2022-08-18 | 11:40:50 | Admin | Touch sensing on | | | | | | | |
| | 6 | **** | | | | | | > | | | | |

xx2200001899

The Logbook Viewer can be started from the Add-Ins tab in Robotstudio. Select Kemppi Logbook Viewer to start.

| 30 III II = (2 + Q + Q + F) | | | | | | | |
|-----------------------------|---------------------|------------|-------------|------------|-----------------|--------------------|--|
| File | lome N | lodeling | Simulation | Controller | RAPID | Add-Ins | |
| RobotApps | (install | ArcWelding | ArcWelding2 | RobotLoad | F ronius | V Kemppi | |
| Community | Package Packages | Pow | verPacs | RobotLoad | TPS/i ▼ | Logbook Viewer | |

xx2200001900

Supported languages

The Logbook Viewer has support for all languages currently supported by the A7 Welder. These are :

- English
- Finnish
- Chinese
- German
- Norwegian
- Danish
- Dutch
- French

Continued

- Spanish
- Russian
- Portuguese (Brazil)
- Italian

The language will be automatically set to the same language that is active in the welder once the logbook entries are downloaded. If opening a file from the hard disk and no previous logbook entries have been downloaded, the viewer uses the current culture settings.

Buttons

| Button | Description |
|--------|---------------------------------------------------------------------------------------------------------|
| • | Start download of the specified number of entries. |
| | Open a browser dialog and load a previously saved logbook file. |
| | Save logbook entries to a file. |
| Ū | Clear logbook files in current view (entries will only deleted in RobotStu- dio, not in the welder). |
| | Start the Web UI. |

Settings

| RobotApps | Ansicht1 | A7 Logb | oook Viewer 1.0.0 🗙 | |
|------------------------|----------|---------|-------------------------|----|
| Settings IP address | 10.49.19 | 90.109 | Start from entry number | |
| User | | ~ | Entries to download | 20 |
| PIN Code | | | | |

xx2200001907

| Setting | Description |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IP Address | The IP address of the A7 welder. Enter a valid IP address. A ping is sent prior downloading the logbook entries awaiting a response from the entered client IP. |
| User | A username is needed if user identification is active in the A7 welder. |
| PIN Code | A pin code for the selected user is needed if user identification is active in the A7 welder. |

Continues on next page

Continued

| Setting | Description |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Start from entry number | Enter a number the download should start from. Leave it empty to start from the most recent logbook entry. |
| Entries to down- load | Number of logbook entries to download. Leave it empty to download all entries. |
| | Downloading all entries can take some time (up to several minutes) de- pending on the number of logbook entries available in the welder. |
| | A progress bar is shown as long as the download is active |

This page is intentionally left blank

10.1 Production Screen widgets

10 Customize widgets

10.1 Production Screen widgets

Introduction

The Kemppi A7 Package provides a set of widgets that can be used. The configuration is done with the template files located in the system's HOME folder. \HOME\Arc\Kemppi_A7\WidgetConfig



xx2200001908

Copy the template file(s) into the following folder in the systems HOME directory and restart Production Screen.

10.1 Production Screen widgets *Continued*

HOME\ProdScr\config



xx2200001909

The customizable widgets are placed on page 2.

For more information about how to use and setup *Production Screen*, see *Application manual - Production Screen*.

Simulate Process widget

The **Simulate Process** widget can be used in manual and automatic mode. It can be used to test the welding program. The power source simulates a real welding process by using the welding simulation signal.

- A programmed welding path can therefore be travelled without any welding taking place
- All signals are set, just like the real thing (with no timing interdependencies or actual values)
- Arc stable
- No arcs are ignited
- No wire electrode is fed
- The gas solenoid valve is not activated

90

10.1 Production Screen widgets Continued



ArcStatus widget

The **ArcStatus** widget has a status LED to indicate active welding process. Also, the widget shows the current seam name and segment.



Continues on next page

10 Customize widgets

10.1 Production Screen widgets *Continued*

Stop Process widget

The **Stop Process** widget can be used to stop the current welding process. This is mainly used for testing and should not be used in real production.



xx2200001912

10.2 Modifying the widgets on the FlexPendant

10.2 Modifying the widgets on the FlexPendant

The widget area

The widget area is a 10x4 grid of cells. Each cell is 60x60 pixels. The smallest space a widget can occupy is one cell.

Widget area navigation

Tap the widget page indicators or the widget page navigation arrows to change widget page.

To access the widget location view, first enable widget move state, then tap and hold the widget. The widget can now be moved by tapping any cell in the widget area.



xx2200001913

10 Customize widgets

10.2 Modifying the widgets on the FlexPendant *Continued*

| Page 2 | | | | 0 | • | 0 | • |
|--------|--------------|-----------|-----|---|---|---|---|
| | Click to pla | ace widge | et. | | | | |
| | | | | | | | |

xx2200001914

The widget can also be moved to a different page. Tap and hold a widget to access the widget location view. Tap the desired page in the widget page indicator. Finally, tap any cell in the widget area.

Index

T tracking methods, 73



ABB AB Robotics & Discrete Automation S-721 68 VÄSTERÅS, Sweden Telephone +46 (0) 21 344 400

ABB AS

Robotics & Discrete Automation Nordlysvegen 7, N-4340 BRYNE, Norway Box 265, N-4349 BRYNE, Norway Telephone: +47 22 87 2000

ABB Engineering (Shanghai) Ltd.

Robotics & Discrete Automation No. 4528 Kangxin Highway PuDong New District SHANGHAI 201319, China Telephone: +86 21 6105 6666

ABB Inc.

Robotics & Discrete Automation 1250 Brown Road Auburn Hills, MI 48326 USA Telephone: +1 248 391 9000

abb.com/robotics