

ROBOTICS

Application manual

Programming Integrated Power Source



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Application manual Programming Integrated Power Source

RobotWare 6.08

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Table of contents

	Over	view of this manual	7
1	Safet	y	9
	1.1	Safety	g
	1.2	Safety for arc welding	10
	1.3	Safety signals in the manual	11
	1.4	Make sure that the main power has been switched off	13
2	Integ	rated Power Source applications	15
	2.1	Overview	15
	2.2	Start the Integrated Power Source	16
	2.3	Active arc welding system	17
3	Integ	rated Power Source application details	19
	3.1	Schedule management	19
		3.1.1 Open schedule window	19
		3.1.2 Create a schedule	20
		3.1.3 Copy a schedule	22
		3.1.4 Delete a schedule	23
		3.1.5 Viewing schedule components	24
		3.1.6 Editing schedule components	27
	3.2	Manage user defined synergic lines	31
	0.2	3.2.1 Open the window for management of user defined syneroic lines	31
		3.2.2 Create a user defined synergic line	32
		3.2.3 Display all user defined synergic lines	27
		3.2.4 Delete a user defined synergic line	34
		3.2.5 Onen and save a user defined synergic line	25
	33	Advanced functions	27
	5.5	2.2.1 Open advanced functions window	27
		3.3.1 Open advanced functions window	20
		3.3.2 Service functions	20
		2.2.4 Sottingo	71
	24	J.3.4 Settings	41
	3.4	Dackup and restore schedules	47
		3.4.1 Open backup and restore window	47
		3.4.2 Backup schedules	48
	<u> </u>	3.4.3 Restore schedules	49
	3.5	Exporting schedule components	51
	3.6	Viewing measured welding data	52
		3.6.1 Measured welding data	52
4	Prog	ramming schedules	53
	4.1	Overview	53
		4.1.1 About schedules	53
	4.2	Synergic data values – a programming aid	54
		4.2.1 Syneric data values	54
	4.3	Schedule components	55
		4.3.1 Settings	55
		4.3.2 Mode	56
		4.3.3 Method	57
		434 Creenstart	61
		4.3.5 Hotstart	62
		436 Craterfill	65
		1.0.0 Oralerilli	70
		4.0.7 Syncigic	70
		4.0.0 Where speed	11
		4.0.9 Vullaye	12
		4.3.10 Arc length	74

		4.3.11 Dynamic properties	75		
		4.3.12 Regulator type	76		
		4.3.13 Pulse current	77		
		4.3.14 Pulse time	78		
		4.3.15 Background current	79		
		4.3.16 Frequency	80		
		4.3.17 Slope	81		
		4.3.18 Ka	82		
		4.3.19 Ki	83		
		4.3.20 Final wirefeed speed	84		
		4.3.21 Final voltage	85		
		4.3.22 Final arc length	86		
		4.3.23 Final pulse current	87		
		4.3.24 Final background current	88		
		4.3.25 Final frequency	89		
		4.3.26 Craterfill time	90		
		4.3.27 Burnback time	91		
		4.3.28 Final pulse	92		
		4.3.29 Touch sense current	93		
		4.3.30 Phase time	94		
5	Pred	Predefined synergic lines			
	5.1	Introduction	95		
	5.2	Setting the welding process	96		
•	. .		~~~		
6	Карю	d command ^Load	99		
	6.1	Load the .sid file	99		
7	Rapio	d command *Store	101		
	7.1	Saving the .sid file	102		
8	Rapio	d command *Tune	105		
	8.1	Setting Numeric Schedule Components	106		
Inc	dex		109		

Overview of this manual

About this manual

This manual contains information on how to:

- · Create and edit schedules.
- Create user defined synergic lines.
- · Read service information and execute service functions.
- Backup and restore SID files.

Usage

This manual is intended to be used for:

- Programming
- Maintenance

Who should read this manual?

This manual is intended for:

- Robot programmers
- Maintenance personnel

Basic knowledge

Readers of this manual must be:

- · Familiar with industrial robots and the relevant terminology
- Familiar with RAPID programming language
- Familiar with system parameters and how to configure them.

Reference documents

References	Document ID
Technical reference manual - RAPID Instructions, Functions and Data types	3HAC050917-001
Technical reference manual - System parameters	3HAC050948-001
Application manual - Arc and Arc Sensor	3HAC050988-001
ESAB user manual	

Revisions

Revision	Comment
-	First revision.
A	 Released with RobotWare 6.04 Updated FlexPendant screen shots. Minor corrections.
В	Released with RobotWare 6.08. Added limitation for AristoMig Integrated.

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1 Safety

1.1 Safety

Safety of personnel			
	A robot is heavy and extremely powerful regardless of its speed. A pause or lot stop in movement can be followed by a fast hazardous movement. Even if a patter of movement is predicted, a change in operation can be triggered by an externa signal resulting in an unexpected movement.		
	Therefore, it is important that all safety regulations are followed when entering safeguarded space.		
Safety regulations			
	Before beginning work with the robot, make sure you are familiar with the safety regulations described in the manual <i>Operating manual - General safety information</i> .		

1.2 Safety for arc welding

1.2 Safety for arc welding

Safety instructions for arc welding

Safety instructions can be found in the manual *Introduction and Safety - Arc Welding Products* for all steps that involve risk of personal injury or material damage. In addition, they are included in the instructions for each step.

General warnings, where the intention is to avoid problems, are only included in the instructions.



All personnel working with the welding robot system must have a full understanding of the applicable safety instructions.

1.3 Safety signals in the manual

Introduction to safety signals

This section specifies all safety signals used in the user manuals. Each signal consists of:

- A caption specifying the danger level (DANGER, WARNING, or CAUTION) and the type of danger.
- A brief description of what will happen if the the danger is not eliminated.
- Instruction about how to eliminate danger to simplify doing the work.

Danger levels

The table below defines the captions specifying the danger levels used throughout this manual.

Symbol	Designation	Significance
	DANGER	Warns that an accident <i>will</i> occur if the instructions are not followed, resulting in a serious or fatal injury and/or severe damage to the product. It applies to warnings that apply to danger with, for example, contact with high voltage electrical units, explosion or fire risk, risk of poisonous gases, risk of crushing, impact, fall from height, and so on.
	WARNING	Warns that an accident <i>may</i> occur if the instructions are not followed that can lead to serious injury, pos- sibly fatal, and/or great damage to the product. It applies to warnings that apply to danger with, for example, contact with high voltage electrical units, explosion or fire risk, risk of poisonous gases, risk of crushing, impact, fall from height, etc.
	ELECTRICAL SHOCK	Warns for electrical hazards which could result in severe personal injury or death.
!	CAUTION	Warns that an accident may occur if the instructions are not followed that can result in injury and/or damage to the product. It also applies to warnings of risks that include burns, eye injury, skin injury, hearing damage, crushing or slipping, tripping, im- pact, fall from height, etc. Furthermore, it applies to warnings that include function requirements when fitting and removing equipment where there is a risk of damaging the product or causing a breakdown.
	ELECTROSTATIC DISCHARGE (ESD)	Warns for electrostatic hazards which could result in severe damage to the product.
	NOTE	Describes important facts and conditions.

1 Safety

1.3 Safety signals in the manual *Continued*

Symbol	Designation	Significance
	TIP	Describes where to find additional information or how to do an operation in an easier way.

1.4 Make sure that the main power has been switched off

Description

Working with high voltage is potentially lethal. Persons subjected to high voltage may suffer cardiac arrest, burn injuries, or other severe injuries. To avoid these personal injuries, switch off the main power on the controller before proceeding work.



Switch off all main power switches in a MultiMove system.

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2.1 Overview

2 Integrated Power Source applications

2.1 Overview

General

Integrated Power Source is an administrative interface for power sources in FlexPendant.

The following power sources are compatible with the Integrated Power Source:

- Arcitec IRC5
- MigRob 500
- AristoMig 500 Integrated

Limitation for AristoMig Integrated

The latest versions of firmware for AristoMig Integrated that are tested and supported with IRC5 are WDL 1.05 and PS 1.39P.

2.2 Start the Integrated Power Source

2.2 Start the Integrated Power Source

Action Info/Illustration Tap the ABB menu. 1 Guard Stop Stopped (2 of 2) (Speed 100%) Manual A_ErrorGenSyst.. (192.168.8..) 2 Tap Integrated Power Source. \equiv \vee 38 X • • • Page 1 The program starts. -WER Stat:T_ROB1 MoveOut Escape SkipFwd SkipSeam 2094 2212 3320 0 3313 Reset - CP \Box -Setup Part Arc COAP 1/2 Sorvice Info xx1400001756 3* X Manual Guard Stop A_ErrorGen5yst.. (192.168.8..) Stopped (2 of 2) (Speed 100%) 3 Once the program has been loaded, a ioAristoMigInt1 /ARC1 ZROB_1 desktop is displayed with a number of Integrated Power So icons. The power source functions can be accessed from here. AristoMig Integrated Tap on the shutdown button (top right corner) to close Integrated Power Source. -4 0 \langle Schedules Synergic Lines Advanced Backup and Restore Functions Production Screen xx1400001757

How to start the Integrated Power Source tool:

2.3 Active arc welding system

2.3 Active arc welding system

Introduction

The selection of the arc welding system determines which equipment is active when manual operations - i.e. Gas On, Manual Wire feed, Editing schedules - are executed.

See Application manual - Arc and Arc Sensor on how to change active arc welding system.

Active power source information

The I/O unit name of the active power source, the name of the active arc welding system and the robot associated with that system, are indicated in the top right.



xx1400001758

The arc welding system System 1 associated with robot ROB_1 is active. The power source B_AW_PROC_40 is configured in that system.



A	The robot associated with the active arc welding system, e.g ROB_1
В	The name of the active arc welding system, e.g System 1
С	The I/O unit name of the active power source, e.g B_AW_PROC_40

2 Integrated Power Source applications

2.3 Active arc welding system *Continued*

Note

When the active arc welding system or active robot is changed, the Integrated Power Source reverts to desktop mode. If active power source is not compatible with Integrated Power Source or that the power source is unconnected, the Integrated Power Source desktop icons will be grayed out.

3.1.1 Open schedule window

3 Integrated Power Source application details

3.1 Schedule management

3.1.1 Open schedule window

Open schedule window

	Action	Info/Illust	ration		
1	Tap Schedules in the start window to open the schedule window.	Integrated Power S	Manual A_ErrorGen5yst (192.168.8. Gource	Guard Stop .) Stopped (2 of 2) (Spee ioAristoMig	d 100%)
		Schedule	AristoMig	Integrated	Backup and Restore
		xx1400001759			73 40
2	All schedules stored in the power source are listed.	Schedule Manager	Manual A_ErrorGenSyst (192.168.8. 4 5 6 7	Guard Stop Stopped (2 of 2) (Speen ioAristoMig 8 9	H 100%)
		13 14	15-16 17 18 19	20 21-22	23 24
		35-36 37	27 28 29 30 38 39 40 43	J 31 32 L 42 43	33 34 44 45
		46 47	48 49 50 5:	1-52 53-54 55-56	57 58
		59 60	61 62 63-64 6	5 66 67	68 69
		81 82	72 73 74 73 83 84 85 86	5 87 88	79 80 89 96
		97 98	99		
		New	Delete Dupli	cate Edit	Close
		Production Screen			ROB_1
		xx1400001760			

🍟 Tip

A schedule with the Super pulse mode activated is followed by a plus character. This schedule occupies two schedule memory positions. E.g if schedule 1 has the Super pulse mode enabled, it is not possible to store a schedule with the number 2.

3.1.2 Create a schedule

3.1.2 Create a schedule

Create a schedule

	Action	Info/Illustration
1	In the Schedule window, tap New .	Image: Constraint of the second state of th
2 3 4	 A numerical keypad is displayed. You can add a new schedule number in two different ways: Use the number suggested by the system. Enter the new schedule number using the numeric keys. Tap OK to create a new schedule. Tap Cancel to cancel creating a new schedule. 	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$
5	The schedule window is updating. The created schedule is highlighted.	Manual A.E.rordcardyst. Guard Star Stopped (2 of 2) (Speed 100%) Max Schudule Manager IoAristoMujint / 1 1-12 A.E.rordcardyst. (192.164.8) Stopped (2 of 2) (Speed 100%) Act



The content of the new schedule is identical to the most recently activated schedule in the power source. See *Copy a schedule on page 22*.

3.1.2 Create a schedule Continued



Note

A new schedule never has Super pulse activated, regardless of what the last activated schedule had.

3.1.3 Copy a schedule

3.1.3 Copy a schedule

Instructions

	Action	Info/Illustration
1	In the Schedule window, tap to select the schedule to be copied.	Schedule Manager Manual A_ErrorGenSyst (192.168.8) Guard Stop Stopped (2 of 2) (Speed 100%) Image: Comparison of the stopped (2 of 2) (Speed 100%)
2	Tap Duplicate.	2 3 4 5 6 7 8 9 10 11-12 13 14 15-16 17 18 9 20 21-22 23 24 25 26 27 28 29 30 31 32 34 35-36 37 38 39 40 41 42 43 45 56 47 48 49 50 51-52 53-54 55 57 58 59 60 61 62 63-64 65 66 67 68 69 70 71 72 73 74 75-76 77 78 79 80 97 98 99 55 57 55 57 57 58 97 98 99 85 86 87 89 96 97 98 99 55 55
		xx1400001760
3	 A numerical keypad is displayed. Use the schedule number suggested by the system. Enter the new schedule number us- ing the numeric keys. 	Image: Construction of the second s
4	Tap OK to copy the schedule number.	Voltage trim 0 (19.00) V
5	Tap Cancel to abort the copying.	Burnback time 0.12 s Touch sense current 10 A
		Production
		xx1400001763
6	The schedule window is updating. The created schedule is highlighted.	Image: Manual Guard Step Stapped (2 of 2) (Speed 100%) Image: Image: <thimage:< th=""> <thimage:< th=""> <thimage:<< th=""></thimage:<<></thimage:<></thimage:<>



A schedule with Super pulse can only be copied to an odd schedule number between 1 and 95.

3.1.4 Delete a schedule

3.1.4 Delete a schedule

Instructions

	Action	Info/Illustration	
1	In the schedule window, select the sched- ule.	Manual Guard Stop Stopped (2 of 2) (Speed 100%) Image: The	/
2	Tap Delete.	1 12 3 14 15-16 17 18 19 20 21-22 24 25 26 27 28 29 30 31 32 33 34 35-36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51-52 53-54 55-56 57 58 59 60 61 62 63-64 65 66 67 68 69 70 71 72 73 74 75-76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 96 97 98 99 21 21 23 New Delete Duplicate Edit Close Image: 1 Image: 1 <td< th=""><th>ð</th></td<>	ð
3	A dialog box appears to confirm deletion of the selected schedule. • Tap Yes to delete the schedule.	Manual A_ErrorGenSyst (192.166.8) Guard Stop Schedule Manager Stopped (2 of 2) (Speed 100%) St 1 2 Schedule Manager 10 10 11-12 10	1
4	Tap No to abort the deletion.	24 2 90? 33 34 3 44 45 4 45 4 58 5 69 7 80 8 90 9 Yes No New Delete Duplicate Edit Close Modemn 1/2 xx1400001765	*
5	The schedule window is updated.	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	

3.1.5 Viewing schedule components

3.1.5 Viewing schedule components

Instructions

	Action	Info	/IIIus	stra	ation						
1	In the schedule window, select the sched- ule.	Schedule	Manager	A_Er	ual rrorGenSyst ((192.168.8.	Guard .) Stopp	I Stop red (2 of 2) iDAris	(Speed 10 toMigInt1	■	
2	Tap Edit.	1 11-12 24 34 45 58 69 80 96 96 Net Screen xx1400	2 13 25 35-36 46 59 70 81 97 81 97	3 14 26 37 47 60 71 82 98	4 15-16 27 38 48 61 72 83 99	5 17 28 39 49 62 73 84 84	to 18 29 40 50 63-64 74 85 cate	7 19 30 41 51-52 65 75-76 86	8 20 31 42 53-54 66 77 87	9 21-22 32 43 55-56 67 78 88 88	10 23 33 44 57 68 79 89 89
3	A schedule window containing the compon- ents of the schedule is displayed. There are two different groups of schedule components: • Non-numeric schedule components • Numeric schedule components	Arrowski standard Second Arrowski standard Sec	<pre>eld to edir time :== v_time : </pre>	Man A_A t the va = = ::=	ual ristoHight () seam1 alue. [0.5, 0.5 0.1 0 0.2 Production Manager	192.168.8 0.1,0,0. Un	Guarante Stopp	t stop ped (Speed Data seam num num num	Type data	ניין ער גער גער גער גער גער גער גער גער גער	nit to 5 of 5



Make a practice of always tapping the **Cancel** button if you are only interested in viewing a schedule and not making unintentional changes.

3.1.5 Viewing schedule components *Continued*

Non-numeric schedule components

Non numeric schedule components consists of:

Edit	al Gi stoMigInt (192.168.8) 51	uard Stop copped (Speed 100%)	X
Name:	seam1		
Tap a field to edit the val	ue.		
Name	Value	Data Type	Unit to 5 of 5
seam1:	[0.5,0.1,0,0.2]	seamdata	
purge_time :=	0.5	num	
preflow_time :=	0.1	num	
<pre>scrape_start :=</pre>	0	num	
postflow_time :=	0.2	num	
	Undo	ОК	Cancel
Calibration	Manager		

xx1400001767

1.	Mode (switch between primary and secondary schedule for Super pulse)
2.	Method
3.	Material
4.	Gas
5.	Wire size
6.	Creepstart
7.	Hotstart
8.	Craterfill
9.	Synergic

Tip

It is possible to configure whether creepstart and hotstart are to be visible in the schedule editor. See *Advanced functions on page 37*.

Numeric schedule components

The numeric schedule components used in a schedule are displayed.

3.1.5 Viewing schedule components *Continued*

In addition the user may choose to display only a subset of the components, by selecting a different view.

Changing the view





These categories and the schedule components included in each category are configurable. See *Advanced functions on page 37*.



If there are no categories for view management, the **View** button will be greyed out and all numeric schedule components available in the schedule will be displayed.

3.1.6 Editing schedule components

3.1.6 Editing schedule components

Introduction

Starting from a schedule window as described in *Viewing schedule components* on page 24.

An arbitrary number of components can be changed in the open schedule before closing the schedule window.

Activating Super pulse

Proceed as follows:

	Action	Info/Illustration
1	Activate Super pulse by selecting Super pulse. Select the normal box to use a nor- mal schedule.	Munual Schedule Manager - New Munual Literative Schedule Manager - New Schedule (Speed 100%) Imager - New Imager - New

Changing method, material, gas and wire dimension

Proceed as follows to make a change:

	Action	Info/Illustration
1	Tap the button displayed in the image.	Image: Control of the second state

3 Integrated Power Source application details

3.1.6 Editing schedule components *Continued*

	Action	Info/Illustration
2	A new window is displayed.	AristoMigInt (192.166.8) Stopped (Speed 100%)
3	Select method, material, gas and wire size.	$\begin{array}{c c c c c c c c c c c c c c c c c c c $
4	To confirm that the changes you have made are to be provisionally saved: tap OK.	Manual All Froncenssyst (192.166.8) Stopped (2 of 2) (Speed 100%) Image: Construction of 2) (Speed 100%) Schedule 91 - Instance 1 ioAristoMigint1 (ARCI (ROB_1)) Mode Image: Construction of 2) (Speed 100%) Image: Construction of 2) (Speed 100%) Mode Image: Construction of 2) (Speed 100%) Image: Construction of 2) (Speed 100%) Mode Image: Construction of 2) (Speed 100%) Image: Construction of 2) (Speed 100%) Method Short pulsed arc Image: Construction of 2) (Speed 100%) Short pulsed arc Image: Construction of 2) (Speed 100%) Image: Construction of 2) (Speed 100%) Gas Ar 296O2 Image: Construction of 2) (Speed 100%) Image: Construction of 2) (Speed 100%) Wree size Image: Construction of 2) (Speed 100%) Image: Construction of 2) (Speed 100%) Image: Construction of 2) (Speed 100%) Wree size Image: Construction of 2) (Speed 100%) Image: Construction of 2) (Speed 100%) Image: Construction of 2) (Speed 100%) Construction of 2) (Speed 100%) Image: Construction of 2) (Speed 100%) Image: Construction of 2) (Speed 100%) Construction of 2) (Speed 100%) Image: Construction of 2) (Speed 100%) Image: Construction of 2) (Speed 100%) Construction of 2) (Speed 100%) Image: Constructi

Switch between schedule instances in Super pulse mode



Only applicable to MigRob500 and AristoMig 500 Integrated or similar.

Proceed as follows:

	Action	Info/Illustration
1	Tap the button to switch between start and end schedule.	Guard Stop A_ErrorGenSyst (192.168.8) Stopped (2 of 2) (Speed 100%) Schedule 91 - Instance 1 IoArtstoMugInt1 ARC1 R08_1
2	Select which schedule is to be shown.	Infort Dulsed are re- to mm to mm t
3	The numeric schedule components are updated.	Name (Process) Unit Loss of a Wirefeed speed m/min Arc length control trim m/min Arc length control trim 0 (2777) - Touch sense current 10 A Phase weld time 200 ms
		123 View OK Cancel
		None Program None xx1400001772 Kost

3.1.6 Editing schedule components *Continued*

Changing crepstart, hotstart, craterfill and synergic

Proceed as follows to make a change:

	Action	Info/Illustration					
1	Tap on the schedule component that you want to change.	Image: Construction of the second state of the second s					
2 3	 The button drops down a list of options. Tap on the option that you want to change to. If you do not want to change the selection, click the top button in the list. 	Image: Construction of the series of the					
	xx1400001774						

Depending on the options set, the value of the numeric schedule components can be changed, and also the number of schedule components in the list.

Adjusting the value of a numeric schedule component

	Action	Info/Illustration			
1	Select the schedule component that you want to change.	Schedule 61	Guard : 12.168.8) Stoppe	Stop d (2 of 2) (Speed 100% ioAristoMigInt1	,) ≌♥ 🗙 ARC1 ≩ROB_1
2	Tap the plus or minus button to change the	Ar 8%CO2 1.0 mm	Cre	Sepstart Hotstart	fil CN
	value of the selected schedule component.	Name (Process) Wirefeed speed	Value 9	m/min	I to 5 of 5
		Voltage trim	0 (19.00)	v	
		Dynamic properties	75	%	
		Burnback time	0.12	s	
		Touch sense current	10	А	
			View	ОК	Cancel
		Screen	Program Data		
		xx1400001775			

3 Integrated Power Source application details

3.1.6 Editing schedule components *Continued*

Editing numeric schedule components

	Action	Info/Illustration
1	Select the schedule component that you want to change.	Guard Stop
2	Tap the 123 button to open a numerical keypad.	Name ▲ Type Name ▲ Type Arc Folder DynPart Folder prodScr Folder WDM Folder SynLine160707.syl .syl file File name: SynLine160707.syl ProdScr OK Cancel Prodster 1/3 xx1400001776
3	Permitted limit values are shown in the nu- merical keypad.	Cuard Stop Schedule 59 Carteria Control Contr
4	Change the value by entering it in the nu- merical keypad.	Strong and at the second se
5	Tap OK to set the value.	Wirtleed speed B m/ 1 2 3 X Voltage trim 0 (16.75) V 0 +/- - -
6	Tap Cancel to cancel.	Dynamic properties 75 96 V V Imits Burnback time 0.12 s Limits Imits Imits Max: 30.00 Touch sense current 10 A Max: 30.00 OK Cancel Image: Some Difference 123 View OK Cancel Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference Image: Difference

Note

When a new value is given using numerical input, the value may sometimes be adjusted automatically. The value is rounded off to the nearest valid value.

3.2.1 Open the window for management of user defined synergic lines

3.2 Manage user defined synergic lines

3.2.1 Open the window for management of user defined synergic lines

Instructions

	Action	Info/Illustration
1	Tap on the Synergic Lines icon to open the window for management of user defined synergic lines.	
2	 The window for management of user defined synergic lines is displayed. From here, you can: Create a user defined synergic line. Display all user defined synergic lines. Delete user defined synergic lines. Open and save user defined synergic lines. 	Menual A_ErrorGenSyst (192.168.8) Guard Stop Stoped (2 of 2) (Speed 100%) Image: Constraint of the stop Stoped (2 of 2) (Speed 100%) Synergic Lines Image: Constraint of the stop Synergic Lines Image: Constraint of the stop Synergic Lines Image: Constraint of the stop Synergic Lines Material Mild steel, low-alloy steel Image: Constraint of the stop Synergic Lines Image: Constraint of the stop Synergic Lines Image: Constraint of the stop Synergic Lines File Create User defined Synergic Lines Close File Create User defined Synergic Lines Image: Constraint of the stop Synergic Lines File Create User defined Synergic Lines Image: Constraint of the stop Synergic Lines Stop Stop Stop Stop File Create User defined Synergic Lines Image: Constraint of the stop Stop Stop Stop Stop Stop Xx1400001779 Stop Stop Stop Stop

3.2.2 Create a user defined synergic line

3.2.2 Create a user defined synergic line

Instructions

Start with defining working points for your synergic line. These working points are created from the schedule management window.

See Schedule management on page 19.

The working points must be stored in schedule 96-99.



See Synergic data values - a programming aid on page 54.

The number of working points used is determined by the method:

- For short arc or spray arc, four (4) working points are required (schedule 96-99).
- For short pulse, two (2) working points are required (schedule 96-97).

	Action	Info/Illustration
1	Start from the window for management of user defined synergic lines. Tap the Create button.	Image: Control of a c
2	A new synergic line is created in the power source.	Name (Process) Determining Wirefeed speed m/min Arc length control trim 0 Czerrido - Touch sense current 10 A Phase weld time 200 ms
		I23 View OK Cancel Production ET_ROBL: 30 Program 1/3 </th

There are also restrictions in the welding parameters, depending on method selected:

Short arc or Spray arc		
Voltage	96 < 97 < 98 < 99	
Wire feed speed	96 < 97 < 98 < 99	
Regulator type	96 = 97 = 98 = 99	
Short pulsed arc		
Arc length	96 < 97	
Wire feed speed	96 < 97	
Pulse current	96 < 97	
Slope	96 = 97	
Ка	96 = 97	
Кі	96 = 97	

3.2.3 Display all user defined synergic lines

3.2.3 Display all user defined synergic lines

	Action	Info/Illustration	
1	 Start from the window for management of user defined synergic lines. Tap User defined synergic lines. 	Minual A.ErrorGenSyst. (192.168.8) Guard 3top Stopped (2 of 2) (Speed 10%) Image: Constraint of the system individual of the system Short/spray arc Material Mild steel, Iow-alloy steel Image: Constraint of the system individual of the system individual of the system individual of the system individual of the system individual of the system individual of the system individual of the system individual of the system individual of the	
2	All user defined synergic lines are dis- played in a list in a new window.	Immail Gaard Stop Stopped (2 of 2) (Speed 100%) User Defined Syncrycit. Lines InAritoMigIn11 Act. (2001) User Defined Syncrycit. Lines InAritoMigIn11 Act. (2001) Shot puladed ar: Mid steel, low-slow steel At the PhiCO2 User defined wire size 1 Shot puladed ar: Mid steel, low-slow steel At 21%CO2 User defined wire size 3 Shot puladed ar: Mid steel, low-slow steel At 21%CO2 User defined wire size 3 Shot puladed ar: Mid steel, low-slow steel At 21%CO2 User defined wire size 3 Shot puladed ar: Mid steel, low-slow steel At 21%CO2 User defined wire size 3 Shot puladed ar: Mid steel, low-slow steel At 21%CO2 User defined wire size 3 Shot puladed ar: Mid steel, low-slow steel At 21%CO2 User defined wire size 1 Shot pulated ar: Mid steel, low-slow steel At 21%CO2 User defined wire size 3 Shot pulated ar: Mid steel, low-slow steel At 21%CO2 User defined wire size 3 Shot plater ar: Mid steel, low-slow steel At 21%CO2 User defined wire size 3 Shot plater ar: Mid steel, low-slow steel At 21%CO2	

Instructions

3.2.4 Delete a user defined synergic line

3.2.4 Delete a user defined synergic line

Instructions

	Action	Info/Illustration		
1	 Start from the window for management of user defined synergic lines. Tap User defined synergic lines. 	Image: Constraint of the synergic lines Synergic Lines Image: Constraint of the synergic lines Image: Constraint of the synergic lines Image: Constraint of the synergic lines Synergic Lines Image: Constraint of the synergic lines Image: Constraint of the synergic lines Image: Constraint of the synergic lines Synergic lines Image: Constraint of the synergic lines Image: Constraint of the synergic lines Image: Constraint of the synergic lines File Create User defined Constraint of the synergic lines Production Image: Constraint of the synergic lines Image: Constraint of the synergic lines Synergic lines Image: Constraint of the synergic lines Image: Constraint of the synergic lines Synergic lines Image: Constraint of the synergic lines Image: Constraint of the synergic lines Synergic lines Image: Constraint of the synergic lines Image: Constraint of the synergic lines Synergic lines Image: Constraint of the synergic lines Image: Constraint of the synergic lines Synergic lines Image: Constraint of the synergic lines Image: Constraint of the synergic lines Synergic lines Image: Constraint of the synergic lines Image: Constraint of the synergic lines Synergic lines Imag		
2	All user defined synergic lines are dis- played in a list in a new window. • Select the synergic line to be deleted	Image: Control of the section of the sectio		
3	Tap Delete.	Short pulsed arc Mid steel, low-alky steel Ar 2%CO2 Uker defined wire size 4 Short pulsed arc Mid steel, low-alky steel Ar 25%CO2 SMO2 Uker defined wire size 3 Short pulsed arc Mid steel, low-alky steel Ar 25%CO2 Uker defined wire size 4 Short fyrary arc Mid steel, low-alky steel Ar 2%CO2 Uker defined wire size 4 Short fyrary arc Mid steel, low-alky steel Ar 2%CO2 Uker defined wire size 4 Short fyrary arc Mid steel, low-alky steel Ar 2%CO2 Uker defined wire size 3 Short fyrary arc Mid steel, low-alky steel Ar 2%CO2 Uker defined wire size 3 Short fyrary arc Mid steel, low-alky steel Ar 2%CO2 Uker defined wire size 3 Short fyrary arc Mid steel, low-alky steel Ar 2%CO2 Uker defined wire size 2 Delete Go Back Short fyrary arc Mid steel, low-alky steel Ar 2%CO2		
4	The user defined synergic line is deleted.	Image: Contract Stop Guard Stop User Defined Synargic Lines (192.16.8.8.) Stopped (2 of 2) (Speed 100%) User Defined Synargic Lines (advistability) ARCL CONTROL Uner Type A Material Gas (advistability) ARCL CONTROL Short pulsed arc Mid steel, low-aloy steel Ar 294002 User defined wre size 1 Short pulsed arc Mid steel, low-aloy steel Ar 294002 User defined wre size 3 Short pulsed arc Mid steel, low-aloy steel Ar 294002 User defined wre size 3 Short pulsed arc Mid steel, low-aloy steel Ar 294002 User defined wre size 3 Short pulsed arc Mid steel, low-aloy steel Ar 294002 User defined wre size 3 Short pulser arc Mid steel, low-aloy steel Ar 294002 User defined wre size 3 Short purser arc Mid steel, low-aloy steel Ar 294002 User defined wre size 1 Short parser arc Mid steel, low-aloy steel Ar 294002 User defined wre size 1 Short parser arc Mid steel, low-aloy steel Ar 294002 User defined wre size 1 Short parser arc Mid steel, low-aloy steel Ar 294002 User defined wre size 1		

3.2.5 Open and save a user defined synergic line

3.2.5 Open and save a user defined synergic line



	Action	Info/Illustration	
1	 Start from the window for management of user defined synergic lines. Tap on the File menu. Select the Open option. 	Image: Synergic Lines Exercice Syst. (192.164.8) Stopped (2 of 2) (Speed 100%) Image: Synergic Lines Synergic Lines Individuality (AAC1 2 roll_1 AAC1 2 roll_1 Line type Synergic line Synergic line Short (Sprary arc c) Voltage Image: Synergic line Material Mild steel, low-alloy steel Image: Synergic line Vice Gas Image: Synergic line CO2 Image: Synergic line Image: Synergic line User defined wire size 1 Image: Synergic lines Image: Synergic lines File Create Synergic lines Close Somer Image: Type: Image: Synergic lines Image: Synergic lines Image: Synergic lines Somer Image: Type: Image: Synergic lines Image: Synergic lines Image: Synergic lines Somer Image: Type: Image: Synergic lines Image: Synergic lines Image: Synergic lines Somer Image: Type: Image: Synergic lines Image: Synergic lines Image: Synergic lines Somer Image: Type: Image: Synergic lines Image: Synergic lines Image: Synergic lines Somer Image: Type: Image: Synergic lines Image: Synergic lines Image: Synergic lines Somer Image: Type: Image: Syne	
2	Select a file.	Image: Constraint of the state of	
3	Tap OK to open the file.	Open - /hd0a/A_ErrorGenSystem/HOME Image: SYL files (*.syl)	
4	Tap Cancel to abort and return to the Synergic Lines window.	Name Type Horizon Arc Folder DynPart Folder fpconfig Folder ProdScr Folder WDM Folder SynLine160707.syl .syl file File name: SynLine160707.syl Concel ProdScr Pile name: SynLine160707.syl Concel SynLine160707.syl SynLine160707.syl Syl file File name: SynLine160707.syl SynLine160707.syl Syl file	

Saving

	Action	Info/Illustration
1	 Start from the window for management of user defined synergic lines. Tap the File menu. Tap Save. 	Manual Guard 3top Super (2 of 2) (Speed 100%) Symergic Lines IoAitstoMigint! ARC1 Line type Symergic line Noticol Short/spray arc Voltage Voltage Material Voltage Symergic line Fe Gas Soft CO2 Voltage Soft User defined wire size 1 Ser defined Close File Create User defined Close Stort/Soran Program T_ROB:::30 Soft Xx1400001779 Xx1400001779 Soft Soft

3 Integrated Power Source application details

3.2.5 Open and save a user defined synergic line *Continued*

	Action	Info/Illustration	
2	A file name is suggested	Manual A_ErrorGenSyst (192.168.	Guard Stop Stopped (2 of 2) (Speed 100%)
3	If you want to change the filename, tap ABC		SYL files (*.syl)
4	Tap OK to save the file.	ApplConf ApplData	Folder
5	Tap Cancel to return to the synergic lines window without saving the file.	Applsys Arc DynPart fpconfig	Folder Folder Folder Folder
		File name: SynLine 160707.syl	OK Cancel
3.3.1 Open advanced functions window

3.3 Advanced functions

3.3.1 Open advanced functions window

Instructions

To open advanced functions for the power source:

	Action	Info/Illustration
1	Tap on the Advanced functions icon to open the Advanced functions window for the power source.	Integrated Power Source Stopped (2 of 2) (Speed 100%) AristoMig Integrated Integrated Power Source Integrate Powere Integrat
2	 The window for advanced functions includes the following functions: Service Information, e.g. version, DeviceNet address, etc. Service functions, e.g. reset, change of DeviceNet address. Settings, i.e. customizing the user interface. 	Manual Guard Stop Advanced Functions Information Service Functions IoAristoMgInt1 Advanced Functions IoAristoMgInt1 Information Service Functions Product name Mig 5000i Power source id 17 Product code 4 WDL version 1.05 B PS version 1.39 P I/O unit name IoAristoMigInt1 DeviceNet address 40 Close Service Internation Close Xx1400001785

3.3.2 Service information

3.3.2 Service information

Instructions

	Action	Info/Illustration
1	In the Advanced functions window, click the Information tab.	Image: Construction Manual Guard Stop Stopped (2 of 2) (Speed 100%) Image: Construction Advanced Functions Information Service Functions Service Ser
2	 The following service information is displayed: Product name Power Source id Product code Weld data unit software version 	Product name Mig 5000i Power source id 17 Product code 4 WDL version 1.05 B PS version 1.39 P I/O unit name ioAristoMigInt1 DeviceNet address 40
	 Power source software version NOTE! Only applicable to Mig- Rob500 and AristoMig 500 Integrated or similar. IO unit name DeviceNet address 	Close Close Close

3.3.3 Service functions

3.3.3 Service functions

General reset

Action Info/Illustration Guard Stop rst.. (192.168.8..) Stopped (2 of 2) (Speed 100%) 28 X 1 In the Service functions window, tap GenioAristoMigInt1 / ARC1 GROB_1 eral reset. dvanced Fu Service Functions Information Settings Addros Initiate a general reset Change DeviceNet address Current address 40 General Reset Change Address Close Careen Data Careen Care xx1400001786 Manual Guard Stop A_ErrorGenSyst.. (192.168.8..) Stopped (2 of 2) (Speed 100%) 3* X 2 Tap **Yes** to confirm resetting of the power Advanced Function ioAristoMigInt1 🥖 ARC1 🥻 ROB_1 source. Information Settings Service Functions 3 Tap No to abort resetting of the power Addres source. Change DeviceNet address Initiate a general reset Current address 40 General Reset Change Address Close Production T_ROB1 : JA xx1400001787 Note When the power source is reset, the schedule memory is cleared and all user defined synergic lines are deleted!

Changing the DeviceNet address

	Action	Info/Illustration
1	In the Service functions window, tap Change address.	Manual Guard Stop Advanced Functions Stopped (2 of 2) (speed 100%) Advanced Functions Interstandigints Information Service Functions Reset Address Initiate a general reset Change DeviceNet address Current address 40 General Reset Change Address Close Close Scope 1/3 - 20 xx1400001788 Change Address

3 Integrated Power Source application details

3.3.3 Service functions *Continued*

	Action	Info/Illustration
2	Enter the new address in the number field that appears.	Manual Guard Stop
3	Tap OK to continue with the address change.	Reset Address 7 8 9 ← Initiate a general reset Chang 4 5 6 →
4	Tap Cancel to abort the address change.	Current ad 1 2 3 Current ad 0 General Reset
_		xx1400001789
5	the power source.	Advanced Functions Afronge DeviceNet address c
6	Tap No to abort the address change on the power source.	Reset Are you sure you want to change the address from 40 to 41? Note: In order for the system to find the I/O unit the controller I/O configuration must match the new address. Yes No Close Close Conce Co



Once the address has been changed, the robot system immediately loses contact with the power source. To enable the robot system to find the power source that has changed address, the I/O configuration in the robot system must be changed.

3.3.4 Settings

3.3.4 Settings

Instructions

	Action	Info/Illustration
1	In the Advanced functions window, tap the Settings tab.	Manual Gaard Stop A_ferrorGenSyst (192.168.8) Stopped (2 of 2) (Speed 100%) Advanced Functions inAritoMight1 / ARCL @ROB_1 Information Convice Europhone
2	 You can configure the user interface for the schedule editor here: Configuring Views. Hiding/showing certain nonnumeric schedule components (Advanced). Selecting which schedule components are to be used for on-line tuning in RobotWare Arc (Tuning). 	Information Service relations Seconds Customes Edit the Views in the Schedule Manager Views Show or hide schedule functions in the Schedule Manager Functions Tuning setup Select schedule components present in RobotWare Arc tuning (RobotWare Arc restart required) Tuning Close Close Close Stream 11.8081.130 12.8081.130 Xx1400001791 X

Customizing views

	Action	Info/Illustration
1	In the Settings tab, tap Views.	A_ErrorGenSyst (192.168.8) Stopped (2 of 2) (Speed 100%)
		Advanced Functions IoAristoMigInt1 / ARC1 CROB_1
		Information Service Functions Settings
		Customize – Edit the Views in the Schedule Manager
		Show or hide schedule functions in the Schedule Manager Functions
		- Tuning setup
		Select schedule components present in RobotWare Arc tuning (RobotWare Arc restart required)
		Close
		C Production T_ROEL: JA
		xx1400001791
2	A new window opens showing all existing	Manual Guard Stop A_ErrorGen5yst (192.168.8) Stopped (2 of 2) (Speed 100%)
	views.	Views ioAristoMigInt1 / ARC1 COB_1
		All
		Process
		Craterfill
		Pulse
		New Edit 🏠 🖖 OK Cancel
		C Program T_ROB1: JA
		xx1400001792
1	1	

3 Integrated Power Source application details

3.3.4 Settings *Continued*

Creating views

	Action	Info/Illustration
1	In the Settings tab, tap New to add a new view.	Image: State of Stop State of Stop ALErrorGenSyst (192.168.8) Stopped (2 of 2) (Speed 100%) Werves ioArtistoMigInt1 Menu Name ARC1 All Process Crater fill Pulse
		New Edit OK Cancel
		xx1400001792
2	A new window opens. Enter the name of the view. 	Input Panel
3	Tap OK to save the view.	
4	Tap Cancel to cancel creating a new view.	q w e r t y u i o p []
		CAP a s d f g h j k l ; ¹ ' + [°]
		Shift z x c v b n m , , , , , , , , , , , , Home
		Intl $\overset{\sim}{}$ χ^{\sim} f \downarrow \leftarrow \rightarrow End
		OK Cancel
		Rodakton ET_ROBI : JA
		xx1400001793

Editing views

	Action	Info/Illustration
1	In the Settings tab, select the name of the view.	Image: Construction of the second state of
2	Tap Edit.	All Process
		Pulse
		New Edit OK Cancel Improvem

3.3.4 Settings Continued

	Action	Info/Illustration
3	 A new window opens showing the names of all possible schedule components. Select the schedule components to be included in the view by checking the box beside each schedule component name. 	Wenual Gaard Stop Views - All Stopped (2 of 2) (Speed 100%) Name InAristoMigint1 Ki Final wirefeed speed Final worklage Final voltage
4	Tap OK to save the changes to the view.	Final pulse current
5	5 Tap Cancel to cancel all changes.	Final frequency Craterfill time Burnback time OK Cancel OK Cancel Streen Descent Discrete Descent Discretee Descent Discreteee Descent Discreteeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee

Changing the name of a views

	Action	Info/Illustration
1	In the Settings tab, tap and hold on the name of an existing view.	Image: Constraint of the second state
2	Select Rename.	All Processs Craterfill Pulse Delete Rename New Edit OK Cancel Program DT_ROEL: M Reg Science DT_ROEL: M Reg xx1400001796
3	Enter a new name for the view.	Image: Constraint of the second state of th
4	Tap OK to change the name of the view.	MyCraterFill
5	Tap Cancel to keep the previous name.	$\begin{array}{c cccc} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 0 & - & = & \\ \hline & q & w & e & r & t & y & u & i & o & p & [&] \\ \hline & q & w & e & r & t & y & u & i & o & p & [&] \\ \hline & GAP & a & s & d & f & g & h & j & k & l & ; & i & * & \\ \hline Shift & z & x & c & v & b & n & m & , & ? & i' & Home \\ \hline & Intl & i & v & & t & t & + & + & End \\ \hline \hline & Intl & i & v & & t & t & + & + & End \\ \hline \hline & \hline & OK & Cancel \\ \hline \hline & Poketon & D & T, IOB : : M & D & D & T, IOB : : M \\ \hline & Xx1400001797 \end{array}$

3 Integrated Power Source application details

3.3.4 Settings *Continued*

Deleting views

1 In the Settings tab, tap and hold the view name. Image: Control State		Action	Info/Illustration
2 Select Delete. All Process Cratefill New Edit OK Carcel New Edit Cok Carcel Very Second Stap Image: Second Stap Second Stap S The view is deleted. Image: Second Stap Second Stap Image: Second Stap Sec	1	In the Settings tab, tap and hold the view name.	Image: Control of the second state Guard Stop Views Image: Control of the second state Views Image: Control of the second state Monu Name Image: Control of the second state
3 The view is deleted.	2	Select Delete .	All Process Cratefill Pulse Delete Rename New Edit OK Cancel
3 The view is deleted.			Program <
	3	The view is deleted.	Menual Guard Step A_frareGenSyst. (192.168.8) Stopped (2 of 2) (speed 100%) Werve IoAristoMigint1 (ARC1 (ROP_1) Menu Name IoAristoMigint1 (ARC1 (ROP_1) All Process Craterfill Pulse New Edit OK Cancel Menu Name IoAristoMigint1 (ARC1 (ROP_1)) All Process Craterfill Pulse New Edit Menu Process IoAristoMigint1 (I) Viscon IoAristoMigint1 (I)

Hiding/showing non-numeric schedule components

	Action	Info/Illustration
1	In the Settings tab, tap Advanced.	Image: Constraint of the schedule functions Stopped (2 of 2) (speed 100%) Advanced Functions isArtistoMigint1 ^ ARC1 ~ (ROB_1 Information Service Functions Customize Edit the Views in the Schedule Manager Views Show or hide schedule functions in the Schedule Manager Tuning setup Select schedule components present in RobotWare Arc tuning (RobotWare Arc restart required) Close ROB_1 Stopped (2 of 1, ROB_1) Image Stapped (2 of 1, ROB_1) Tuning

3.3.4 Settings Continued

	Action	Info/Illustration	
2	A new window opens showing the configur- able non-numeric schedule components. If the box beside the name of the schedule component is selected, the component is visible.	Image: Show or hide Schedule Functions Guard Stop Image: Stoped (2 of 2) (Speed 100%) Show or hide Schedule Functions InAristoMigint1 / ARC1 (ROB_1) Name Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed 100%) Image: Stoped (2 of 2) (Speed (2 of 2) (Spe	
3	If the box beside the name of the schedule component is not selected, the component is hidden in the schedule editor.		
		OK Cancel	
		Rodatton	
		xx1400001799	



If a non-numeric schedule component is hidden, the value of that component will always be set to **OFF** when creating or saving schedules from the **Schedule Management** window.

Changing numeric schedule components for on-line tuning

	Action	Info/Illustration
1	In the Settings tab, tap Tuning.	Immunit Guard Stop Advanced Functions Information Service Functions Information Customize Customize Edit the Views in the Schedule Manager Views Show or hide schedule functions in the Schedule Manager Functions Tuning setup Select schedule components present in RobotWare Arc tuning (RobotWare Arc restart required) Tuning Close Image: Close Roe_1 Sevent Image: Close Sevent Xx1400001791 Kx1400001791 Sevent
2	A new window is displayed showing all nu- meric schedule components that can be configured to be used for on-line tuning in Robotware Arc.	Image: Control of the second stop Image: Control of the second stop Image: Control of the second stop Tuning Setup Image: Control of the second stop Image: Control of the second stop Name Image: Control of the second stop Image: Control of the second stop Voltage Voltage Image: Control of the second stop
3	If the check box beside the schedule com- ponent is selected, the component has been selected for online tuning.	Voltage trim ✓ Arc length control Arc length control trim Dynamic properties Pulse Current Pulse time Background current ✓ CK Cancel ✓ NCK Cancel × x1400001800

3.3.4 Settings *Continued*

Note

If selected schedule components for on-line tuning have been changed, Robotware Arc must be restarted in order for the changes to take effect. No power source tuning is allowed when controller is in AUTO mode. The power source tuning components will be hidden in RobotWare Arc tuning window.

3.4.1 Open backup and restore window

3.4 Backup and restore schedules

3.4.1 Open backup and restore window

	Action	Info/Illustration
1	Tap Backup and restore.	
2	In this window you can select to: Back up the schedule memory. Restore the schedule memory.	Immund Caurd Stop A.ErrorCenSyst (192.168.8) Stoped (2 of 2) (Speed 100%) Backup and Restore IsAristoMigInt1 Backup or restore a SID file Backup SID file Restore SID file Route
T	Note he only file format supported is SID (*.s	id).

3.4.2 Backup schedules

3.4.2 Backup schedules

Instructions

	Action	Info/Illustration
1	Tap Backup SID file.	Manual Guard Stop M.E.FrorGenSyst (192:168.8) Stopped (2 of 2) (Speed 100%) Backup and Restore IoAristoMigInt1 ARCI ROB_1 Backup and Restore IoAristoMigInt1 ARCI ROB_1 Backup SID file Restore SID file Backup SID file Restore SID file Export Close Schedules Program [21,008:13] Soce 1,008:13]
		xx1400001827
2	A default file name is suggested.	Guard Stop Backup Backup Back
3	If you want to change search path and file name: Tap the button to change the file name.	Tap Backup to save all schedules to a SID file [hd0a/A_ErrorGenSystem/HOME/SID160707.sid
		Backup Cancel
4	Tap Backup to save the SID file.	A_ErrorGenSyst (192.168.8) Stopped (2 of 2) (Speed 100%)
5	Tap Cancel to cancel the backup.	Tap Backup to save all schedules to a SID file
		[hd0a/A_ErrorGenSystem/HOME/SID160707.sid Backup Cancel
		Covering UT_ROOL.3A Covering UT_ROOL.3A Covering UT_ROOL.3A Xx1400001801 Covering UT_ROOL.3A

3.4.3 Restore schedules

3.4.3 Restore schedules

Action Info/Illustration A_ErrorGenSyst.. (192.168.8..) Stopped (2 of 2) (Speed 100%) × X Tap Restore SID file. 1 ioAristoMigInt1 / ARC1 ZROB_1 Backup and Restore Backup or restore a SID file 白 Backup SID file... Restore SID file. Export Schedules Close Produ JA Progr T_ROB1 : JA T_ROB1 xx1400001827 Imanual Guard Stop A_ErrorGenSyst.. (192.168.8...) Stopped (2 of 2) (Speed 100%) Restore ioAristoMigInt1 // ARC1 // CR08_1 2 Tap the ... button to select a file. Restore Tap Restore to load a SID file <No file selected> Cancel Screen II T_ROB1 : JA xx1400001802 3* X A_ErrorGenSyst.. (192.168.8..) Stopped (2 of 2) (Speed 100%) A new window opens where a file can be 3 Open - /hd0a/A_ErrorGenSystem/HOME selected. SID files (*.sid) • Select the file to be opened. ٠ Name A Туре Tap OK to continue. Folder 4 🗅 DynPart Folder 🗅 fpconfig Folder 5 Tap Cancel to cancel. D ProdScr Folder WDMSID160707.sid Folder .sid file File name: 습 2 Cancel T_ROB1 : JA Production xx1400001803

Instructions

3.4.3 Restore schedules *Continued*

	Action	Info/Illustration
6	Tap Restore . The SID file will be loaded into the power source.	Manual Guard Stop A_ErrorGenSyst (192.168.8) Stopped (2 of 2) (Speed 100%) Restore InAristoMigint1 Tap Restore to load a SID file /hd0a/A_ErrorGenSystem/HOME/SID160707.sid Restore Cancel Pedation T_ROB1:3A Provide Somen L_ROB1:3A Provide X1400001804



All existing schedules will be deleted and replaced with the schedules stored in the SID file.

3.5 Exporting schedule components

3.5 Exporting schedule components

Instructions

Exports all schedule components in one or more schedules to readable form. The exported file may be imported into any word processor or spreadsheet.

	Action	Info/Illustration
1	In the Backup and Restore window, tap Export Schedules.	Image: Control of the sector of the secto
		Backup SID file Restore SID file
		Export Close
2	Select the schedules to export.	Manual Guard Stop
3	Tap Export.	Expirit match begins mat
4	Save as a text file (*.txt) or a commasepar- ated file (*.csv).	Manual Guard Stop Save As - AndDa/A_ErrorGenSystem/HOME Save As - AndDa/A_ErrorGenSystem/HOME Image: ScheduleData

3.6.1 Measured welding data

3.6 Viewing measured welding data

3.6.1 Measured welding data

General

When an arc welding program is executing the Integrated Power Source window showing voltage, current and heat input of process in active arc welding system. The voltage and current are measured and returned by the power source. These

values are accurate values.

The heat input is calculated from the power and the current welding speed. This value should only be seen as an estimation of the real heat input.



The calculated heat input applies under ideal conditions.

4.1.1 About schedules

4 Programming schedules

4.1 Overview

4.1.1 About schedules

Introduction

A welding schedule is a set of data that is given a task equivalent to RAPID data type. The schedule contains components that control the power source. The schedule is called up from the current seamdata or welddata used in the arc welding instruction.

Before a welding procedure starts, a schedule is always called up automatically. This schedule, or a sequence from any number of schedules, remains active until the welding operation is complete.

The schedule memory contains 99 available schedules defined by numbers 1 - 99.



Note

All 99 schedules are available, but schedule numbers 96 - 99 are special numbers used when creating user defined synergic lines.

4 Programming schedules

4.2.1 Syneric data values

4.2 Synergic data values - a programming aid

4.2.1 Syneric data values

Introduction

There is a synergic function in the power source to simplify the welding program. This means that:

• There is a pre-programmed relationship between the wire feed speed and all other schedule components in the power source.

When programming takes place in synergic mode, only the value for wire feed is programmed, after which all other variables are calculated automatically from the synergic line. The synergic line is based on specified values for method (short arc, spray arc or short pulsed arc), material, wire size and gas mixture. A synergic setting also covers other variables that affect the process: Dynamic Properties, etc.

- Synergic settings are often adequate as final settings. However, sometimes you have to view it as an aid for preliminary setting of data values. In certain cases these must be adjusted using non-synergic settings for various types of joint, welding positions, torch angles, electrode projection, surface quality, etc.
- More schedule components are available when welding programming is undertaken in non-synergic mode. The advantage is that the welding operation can be adapted to more specific requirements.
- When switching from synergic to non-synergic mode the system retains the data values set in the synergic mode.
- When switching in the opposite direction, from non-synergic to synergic mode, the data values are changed back to the synergic values.

4.3 Schedule components

4.3.1 Settings

Introduction

Which schedule components that are used is depending on the following settings:

- Mode
- Method
- Material
- Gas
- Wire size

The schedule components displayed in a schedule can vary depending on:

Setting	Description	
Mode	The welding mode indicates if the power source uses normal schedule mode or Super pulse.	
	Only applicable to MigRob500 and AristoMig 500 Integrated and similar.	
Method	Each method has a specific maximum set of schedule components.	
Material	The method determines the available wire materials.	
Gas	The method and material determine the available gases.	
Wire size	The method, material and gas selected determine the available wire sizes.	
	Note	
	There may be more than one option for certain diameters; this is indicated by <i>high</i> or <i>low</i> . Select the most appropriate with regards to the wirefeed speed.	
Hotstart and craterfill	These functions must be accompanied by specific schedule components.	
Synergic	In synergic mode, schedule components automatically calculated by the system are hidden.	
Conditions	The conditions for the various components are described in section <i>Method on page 57</i> and onwards.	
Synergic mode	The appropriate combination of method, material, gas and wire size defines a synergic line, which is automatically used by the system in synergic mode.	
Non-synergic mode	In non-synergic mode, the process is not affected by the values of the components' material, gas and wire size.	

4 Programming schedules

4.3.2 Mode

4.3.2 Mode

Introduction			
	Specifies the welding mode of the power	r source. Available settings are:	
	Normal		
	Super pulse		
	Note		
	Only applicable to MigRob500 and Aris	toMig 500 Integrated and similar.	
Normal	Welding with the parameters specified ir	the specific schedule.	
Super pulse	The power source pulses between two di 1 and 2.	fferent schedule settings, called instance	
	Note When Super pulse is activated some of used in either one of the instances. The start and stop/end. The power source a stops/ends with instance 2 settings.	the schedule components can only be ese schedule components are related to lways starts with instance 1 settings and	
	Instance 1	Instance 2	

Instance 1	Instance 2
Creepstart	
Hotstart	
	Craterfill
	Burnback time
	Final pulse

4.3.3 Method

4.3.3 Method

Selectable methods

The methods that can be selected are:

- Short arc
- Spray arc
- · Short pulsed arc



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Available schedule components

The schedule components available in a schedule depends on the method selected. If you change method when editing a schedule, the following changes may occur automatically:

- The schedule components available.
- Both numeric and non-numeric values of the remaining components may be changed.
- Synergic will always be ON.

Synergic is ON

If Synergic is ON, the power source calculates the values for components using the current synergic line and the current speed reference for the wire feed. These calculated components are not displayed in the schedule when editing takes place in synergic mode.

Synergic is OFF

If Synergic is OFF, the components and their calculated values are visible in the schedule. There is no difference to the welding process whether Synergic is ON or OFF.

Short arc and spray arc

The following schedule components are available for the short arc and spray arc methods:

Method

- 4.3.3 Method Continued
- Material
- Gas
- Wire size
- Creepstart
- Hotstart
- Craterfill
- Synergic
- Wirefeed speed
- Voltage
- Hotstart wire feed speed¹
- Hotstart voltage^{II}
- Hotstart time¹
- Dynamic properties
- Regulator^{III}
- Final wirefeed speed^{IV}
- Final voltage^V
- Craterfill time^{IV}
- Burnback time
- Final pulse
- Phase time^{VI}

L

- Available if Hotstart is ON
- II Available if Hotstart is ON and Synergic is OFF
- III Available if Synergic is OFF
- IV Available if Craterfill is Short arc craterfill
- V Available if Craterfill is Short arc craterfill and Synergic is OFF
- VI Available if welding mode is in Super pulse mode

Short pulsed arc

Method

- Material
- Gas
- Wire size
- Creepstart
- Hotstart
- Craterfill
- Synergic
- Wirefeed speed
- Arc length
- Hotstart wire feed speed¹
- Hotstart arc length^{II}
- Hotstart time¹
- Pulse current^{III}

4.3.3 Method Continued

- Pulse time III
- Background current^{III}
- Frequency^{III}
- Slope^{III}
- Ka^{///}
- Ki^{///}
- Final wirefeed speed^{IV}
- Final arc length^V
- Final voltage^{VI}
- Final pulse current^V
- Final background current^V
- Final frequency ^V
- Craterfill time^{IV}
- Burnback time
- Phase time ^{VII}
- Available if Hotstart is ON
- II Available if Hotstart is ON and Synergic is OFF
- III Available if Synergic is OFF
- IV Available if Craterfill is Short pulsed arc craterfill or Short arc craterfill
- V Available if Craterfill is Short pulsed arc craterfill and Synergic is OFF
- VI Available if Craterfill is Short arc craterfill and Synergic is OFF
- VII Available if welding mode is in Super pulse mode

Example of changing method

You can change method within the same welding operation. In this example, welding begins using the spray arc method and continues using short pulsed arc. Assume that welddata wd5 and wd6 is created and that seamdata sm3 is created. wd5 is using the schedule 5 and wd6 is using the schedule 6.

Schedule no. 5 Spray arc

Schedule no. 5 using spray arc method:

Mode	Normal
Method	Spray arc
Material	AISi 5
Gas	Ar
Wire size	1.2 mm
Creepstart	Off
Hotstart	Off
Craterfill	Off
Synergic	On
Wirefeed speed	12.00 m/min.
Voltage	0.00 V
Dynamic properties	70%

4 Programming schedules

4.3.3 Method

Continued

Burnback time	0.12 sec.

Schedule no. 6 Short pulsed arc

Schedule no. 6 using short pulsed arc method:

Mode	Normal
Method	Short pulsed arc
Material	AISi 5
Gas	Ar
Wire size	1.2 mm high
Creepstart	Off
Hotstart	Off
Craterfill	Off
Synergic	On
Wirefeed speed	12.00 m/min.
Arc length	0.00
Burnback time	0.12 sec.

Program code

Program code used in this example:

ArcLStart *, v600, sm3, wd6, fine, tool; ArcL *, v600, sm3, wd5, z5, tool; ArcLEnd *, v600, sm3, wd6, fine, tool;

60

4.3.4 Creepstart

4.3.4 Creepstart

Description

Creepstart is an integrated ignition function used to reduce the wire feed speed until the arc is ignited. The wirefeed speed is reduced to 50% of the speed in the current schedule until the arc is stabilized.

Another way of influencing the conditions until the arc is ignited is to use an ignition schedule in seamdata. However, creepstart and ignition schedule should not be used in combination.



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Note

If the method is changed when editing a schedule, the value for creepstart may sometimes change automatically. If so, the new creepstart value becomes the same as the most recently used value in the selected method.

4 Programming schedules

4.3.5 Hotstart

4.3.5 Hotstart

Description

Hotstart is an OFF/ON function that provides increased heat input at the start of welding in order to reduce the risk of defects.

Hotstart is defined in the schedule called up at weld start. The function actuates the process for a specific period defined in Hotstart time, which begins when the arc is ignited.

Hotstart - wirefeed speed functions as a relative value for the wirefeed speed set in the schedule.

In synergic mode, the system automatically selects a higher voltage during the hotstart time. The synergic line is changed temporarily to a slightly higher voltage level. The size of the voltage correction is dependent on the synergic line. The hotstart voltage is not shown in synergic mode.



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Hotstart ON

The following components are available when Hotstart ON is selected:

- Hotstart wire feed speed (relative value).
- In non-synergic mode: Hotstart voltage or Hotstart arc length dependent on selected method.
- · Hotstart time.



Schedule change during hotstart time is not recommended.

Status of hotstart (ON) and the original hotstart time will be retained once they have been initiated regardless of what has been programmed in subsequent schedules that may be called up before the hotstart time is over. In such cases, all new wirefeed and voltage references, basic values as well as offset values, for hotstart will apply on call-up even if these include hotstart OFF. The user must

Continues on next page

4.3.5 Hotstart Continued

therefore check that the components in subsequent schedules have the required values.

Note

There is also a heating function in seamdata (seamdata Heat). Using a combination of the components Hotstart and seamdata Heat is not recommended. In cases where more schedule components will need to be adjusted it is better to use the Heat function instead.

Example of hotstart

In this example a hotstart is executed as follows:

- Hotstart for two seconds once the arc is ignited.
- The wirefeed speed during the hot start time is 8.00 m/min.

Hotstart is defined in ignition schedule 3 in $\tt seamdata\,sm3$. See screenshot of $\tt sm3$ below.

Edit	ial Gui istoMigInt (192.168.8) Sta	ard Stop pped (Speed 100%)	X
Name: Tap a field to edit the va	seam1 lue.		
Name	Value	Data Type	Unit to 5 of 5
seam1:	[0.5,0.1,0,0]	seamdata	
purge_time :=	0.5	num	
preflow_time :=	0.1	num	
scrape_start :=	0	num	
postflow_time :=	0	num	
	Undo	ОК	Cancel
Calibration Calibration Screen	Production Manager		

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4.3.5 Hotstart *Continued*

The hotstart function uses the wirefeed speed in the schedule, in welddata wd3, which in this case is the same schedule:

Edit	l toMigInt. (192.	Gu 168.8) Sta	ard Stop opped (Speed 100%)	X
Name:	weld2			
Tap a field to edit the valu	Je.			
Name	Value		Data Type	Units to 8 of 9
org_weld_speed :=	0		num	
main_arc:	[3,0]		arcdata	\bigtriangleup
sched :=	3		num	
current :=	0		num	
org_arc:	[0,0]		arcdata	
sched :=	0		num	\prec
		Undo	ОК	Cancel
Calibration Calibration Screen	Production Manager	T_ROB1 Module_T		

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Program code:

ArcLStart *, v600, sm3, wd3, fine, tool; ArcLEnd *, v600, sm3, wd3, fine, tool;

Schedule 3 Short arc

Schedule 3 is defined as:

Mode	Normal
Method	Short arc
Material	Fe
Gas	Ar+8% CO2
Wire size	0.8 mm
Creepstart	Off
Hotstart	On
Craterfill	Off
Synergic	On
Wirefeed speed	6.00 m/min
Voltage	0.00 V
Hotstart - wirefeed speed	2.00 m/min
Hotstart time	2.00 sec
Dynamic properties	85%
Burnback time	0.12 sec

4.3.6 Craterfill

4.3.6 Craterfill

Description

Craterfill is an ON/OFF function. It provides ramped craterfill by means of the welding values decreasing in stationary mode at the end of the welding operation. This is done to reduce the risk of defects in the weld's end crater.



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Variants

There are two variants of craterfill

- Short arc craterfill
- · Short pulse craterfill

Both these can be used after a short pulsed arc phase.

Only short arc fill can be used after short arc or spray arc welding.



Note

There is also a filling function in seamdata.

The special feature of seamdata filling is a cooling process where the arc is temporarily shut off.

After cooling, seamdata filling can be performed in the same welding schedule or in a separate filling schedule that is called up.

The user can define either ramped craterfill, seamdata filling or both.

Ramped craterfill can be used before and/or after cooling.

Components in synergic mode

In synergic mode, the following components are available:

- · Craterfill time
- Final wirefeed speed

4 Programming schedules

4.3.6 Craterfill Continued

Components in non-synergic mode

In non-synergic mode, the following components are available:

- Craterfill time
- Final wirefeed speed
- Final voltage with short arc fill
- Final arc length with short pulse fill
- Final pulse current with short pulse fill
- · Final background current with short pulse fill
- Final frequency with short pulse fill

Craterfill, example 1: Ramped craterfill (no cooling)

Craterfill is defined in the schedule used in ArcWare welddata, in this case schedule 3 in welddata; wd3. See screenshot of wd3 below.

Edit	al stoMigInt., (192	Guard .168.8) Stoppe	Stop d (Speed 100%)	X
Name: Tap a field to edit the valu	weld2 ue.			
Name	Value		Data Type	UnitS to 8 of 9
org_weld_speed :=	0		num	
main_arc:	[3,0]		arcdata	
sched :=	3		num	
current :=	0		num	
org_arc:	[0,0]		arcdata	
sched :=	0		num	\prec
		Undo	ОК	Cancel
Calibration Calibration Screen	Production Manager	T_ROB1 Module_T		

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If the filling function is available, in this case the filling time must be set to 0 in seamdata schedule sm3.

Program code

Program code used in this example:

ArcLStart *, v600, sm3, wd3, fine, tool; ArcLEnd *, v600, sm3, wd3, fine, tool;

Schedule 3 Short arc

Schedule 3 is defined as:

Mode	Normal
Method	Short arc
Material	Fe
Gas	Ar+8% CO2
Wire size	0.8 mm

4.3.6 Craterfill Continued

Craterfill	Short arc fill
Creepstart	Off
Hotstart	Off
Synergic	On
Voltage	0.00 V
Wirefeed speed	6.00 m/min
Final wirefeed speed	4.00 m/min
Craterfill time	2.50 sec
Burnback time	0.12 sec
Dynamic properties	85%

Craterfill, example 2: Ramped craterfill and filling with cooling

Craterfill is not defined in the schedule used in ArcWare welddata, in this case schedule 4 in welddata; wd4. See the figure below.

Edit	Guai rGen5yst (192.168.8) Stop	rd Stop nped (2 of 2) (Speed 10	D0%) X
Name:	weld62		
Tap a field to edit the valu	e.		
Name	Value	Data Type	Unit to 6 of 9
weld62:	[9,0,[62,0],[0,0]]	welddata	
weld_speed :=	9	num	mm/s
org_weld_speed :=	0	num	mm/s
main_arc:	[62,0]	arcdata	
sched :=	62	num	
current :=	0	num	\checkmark
	Undo	ОК	Cancel
Production Screen	T_ROB1 : JA		

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Craterfill is defined in the filling schedule used in ArcWare seamdata sm4. In sm4, 0.01 seconds' filling time is used for initiation of craterfill by calling up schedule 3. The cooling time in this example is 1 second.

67

4.3.6 Craterfill *Continued*

See screenshot of ${\tt sm4}$ below.

	nual AristoMigInt (192.16	8.8)	Guard Stop Stopped (Speed 100%)	
Name:	seam10			
Tap a field to edit the	value.			
Name	Value		Data Type	Unit to 7 of 10
purge_time :=	0.3		num	$\Rightarrow \land$
preflow_time :=	0.3		num	
scrape_start :=	0		num	
cool_time :=	1		num	
fill_time :=	0		num	
fill_arc:	[0,0]		arcdata	\swarrow
		Undo	ОК	Cancel
T_ROB1 Module				

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Program code

Program code used in this example: ArcLStart *,v600, sm4, wd4, fine, tool; ArcLEnd *, v600, sm4, wd4, fine, tool;

Schedule 3 Short arc

Schedule 3 is defined as:

Mode	Normal
Method	Short arc
Material	Fe
Gas	Ar+8% CO2
Wire size	0.8 mm
Craterfill	Short arc fill
Creepstart	Off
Hotstart	Off
Synergic	On
Voltage	0.00 V
Wirefeed speed	6.00 m/min
Final wirefeed speed	4.00 m/min
Craterfill time	2.50 sec
Burnback time	0.12 sec
Dynamic properties	85%

4.3.6 Craterfill Continued

Schedule

Short arc

Schedule 4 is defined as:

Mode	Normal
Method	Short arc
Material	Fe
Gas	Ar+8% CO2
Wire size	0.8 mm
Craterfill	Off
Creepstart	Off
Hotstart	Off
Synergic	On
Voltage	0.00 V
Wirefeed speed	6.00 m/min
Burnback time	0.12 sec
Dynamic properties	85%

4 Programming schedules

4.3.7 Synergic

4.3.7 Synergic

Description

The power source can be used in both synergic and non-synergic mode.

Synergic means that certain values used in the process are calculated by the system on the basis of a synergic line once a wire feed speed is selected. This procedure follows the original principle of "one knob control".

The number of components shown in a schedule is dependent on whether synergic or non-synergic mode has been selected. Information on available schedule components can be found in the Method section.



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4.3.8 Wirefeed speed

4.3.8 Wirefeed speed

Description	
·	The wirefeed speed for the welding electrode.
Adjustment range	
	The adjustment range for the wirefeed speed is dependent on the type of wire feed unit and power source used. The speed range is displayed automatically in the schedules used. The wire feed unit's speed range is specified in the description of the unit in the Welding equipment manual.
Synergic ON	
	When synergic is ON, changes to the wirefeed speed affect the welding voltage and other variables included in the synergic line calculation.
Synergic OFF	
	When synergic is OFF, changes to the wirefeed speed do not affect any other components.
References	
	The wire feed speed range is described in the product manual for the welding equipment.

4.3.9 Voltage

4.3.9 Voltage

Description

Voltage is available when short arc or spray arc has been selected as method.

Voltage adjustment is used for fine tuning of the arc so that the process remains stable.

One fundamental feature of both methods is that an increased voltage value increases the arc length and heat input, and a reduced voltage value reduces the arc length and heat input.

Control of the welding voltage differs depending on whether synergic or non-synergic mode has been selected.

Schedule 46	Guard St 92.168.8) Stopped	op 🛛 🗐 🗐 🗐 🗐 🗐 🗐 🖉 🕅 👔 (2 of 2) (Speed 100%) 🔹 ioAristoMigInt1 🦯 ARC1 了 ROB_1
Short/spray arc Fe Ar 8%CO2 1.0 mm		pstart Hotstart OFF
Name (Process)	Value	Unit 1 to 4 of 4
Wirefeed speed	9	m/min
Voltage trim	0 (19.00)	V
Dynamic properties	75	%
Burnback time	0.12	S
123	View	OK Cancel
Screen	T_ROB1 : JA	

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Synergic ON

In synergic mode, the welding voltage is calculated from the synergic line. The welding voltage can be adjusted +/- from the synergic line. The working area is dependent on the values selected for the components' material, gas and wirefeed speed. The absolute value of the voltage is shown in brackets as information. The relationship between wire feed speed and voltage is shown in graphic form below.
4 Programming schedules

4.3.9 Voltage Continued



4.3.10 Arc length

4.3.10 Arc length

Description	
	When short pulsing is selected as method, voltage is replaced by a setting for arc length. One fundamental feature is that an increased arc length value increases the arc's length and heat input, and a reduced arc length value reduces the arc's length and heat input. Arc length functions in the same way as voltage with regard to synergic settings and has roughly the same value range as voltage, however, Arc length is not a quantity but a unit.
Available	

Arc length is available when short pulsed arc is selected.

74

4.3.11 Dynamic properties

4.3.11 Dynamic properties

Description	
	Dynamic properties is an electronic inductance control that is used to control the current rise during the short circuit phase in the short arc cycle.
	It is used to fine-tune short arc welding by regulating the short circuit frequency, heat input and molten pool. It is particularly useful when CO2 is used as shielding gas.
	Dynamic properties influences the heat input, depth of penetration and quantity of welding spatter. Low values provide less heat input, and higher values provide greater heat input.
	Dynamic properties regulates the size of the globules in short arc welding. With spray arc welding, the process is only influenced during the ignition phase when the wire is shortcircuited against the workpiece.
Available	
	Dynamic properties is only available with the short arc and spray arc methods.
Adjustment range	
	The adjustment range is 0 - 100%.

4.3.12 Regulator type

4.3.12 Regulator type

Introduction	
	There are 12 different types of regulators.
Regulator type 1	
	Regulator type 1 is designed for Ar and CO2 welding.
	Regulator type 1 is suitable for standard short arc welding.
Regulator type 2 - 5	
	Regulator type 2 - 5 are designed for CO2 welding with various wire sizes and are selected automatically in synergic mode.
	 Optional regulator type 2 - 5 can be selected by the user in order to the process.
Regulator type 6	
	Regulator type 6 is designed for Ar and CO2 welding.
	Regulator type 6 produces less heat and is therefore suitable for high-speed welding with short arc.
Regulator type 7 - 12	2
	Regulator type 7 - 12 are experimental versions without a specified purpose.
	Regulator type is only available with the short arc and spray arc methods in non-synergic mode.
	Note
	Changing regulator type is not recommended.

4.3.13 Pulse current

4.3.13 Pulse current

Pulse current is the pulse's amplitude (see <i>Diagram- short pulsing components on page 81</i>). In synergic mode the amplitude is dependent on selected values for material, gas and wire size.
A higher pulse current provides greater pinch off current and alters the arc shape. Pulse current and pulse time can be combined in order to alter the shape of the arc from concentrated to broad, which affects weld penetration and weld width. The arc's length is also affected.
The adjustment range is 100 - 600 A.
Pulse current is only available when short pulsing and synergic OFF are selected.

4.3.14 Pulse time

4.3.14 Pulse time

Description	
	The pulse time controls the pulse current's duration for short pulsing and includes the slope on one side of the pulse (see <i>Diagram- short pulsing components on page 81</i>).
Adjustment range	
	The adjustment range is 1.7 - 11.0 milliseconds.
Available	
	Pulse time is only available when short pulsing and synergic OFF are selected.

4.3.15 Background current

4.3.15 Background current

Description	
Description	Background current is the current level between the pulses (see <i>on page 63</i>). The background current maintains the arc between the pulses. The background current affects the arc length and stability.
Adjustment range	The adjustment range is 12 - 300 A.
Available	
	Background current is only available when short pulsing and synergic OFF are selected.

4.3.16 Frequency

4.3.16 Frequency

Description	
	The frequency controls the length of the pulse cycle and directly affects the duration of the background current (see <i>Diagram- short pulsing components on page 81</i>). The frequency has a big influence on the arc length and the heat input to the workpiece.
Adjustment range	
	The adjustment range is 38 - 312 Hz.
Available	
	Frequency is only available when short pulsing and synergic OFF are selected.

4.3.17 Slope

4.3.17 Slope

Description	Slope controls the pulse's up and down ramping time.
Adjustment range	Slope is defined by a value between 1 and 9 on a proportional scale. The value of 1 equates to the shortest time and the value of 9 equates to the longest time.

Available

Slope is only available when short pulsing and synergic OFF are selected.

Diagram- short pulsing components



4 Programming schedules

4.3.18 Ka

4.3.18 Ka

Description	
	Ka is a proportional gain factor for control of the arc length. Ka has an individual synergic line. Ka is expressed as a percentage value representing the gain factor.
Adjustment range	
	The adjustment range is 0 - 100%.
	0% provides the slowest regulation.
	 100% provides the fastest regulation.
	If the process has been set to self-oscillation or is unstable, try reducing Ka to a lower value.
Available	
	Ka is only available when short pulsing and synergic OFF are selected.

4.3.19 Ki

4.3.19 Ki

Description	
	Ki is the gain factor.
	Ki is expressed as a percentage of the maximum permitted value.
Adjustment range	
	The adjustment range is 0 - 100%.
	 0% provides the slowest integration.
	 100% provides the fastest integration.
	The standard value can probably be used for all applications, and so Ki does not normally need to be adjusted.
Available	
	Ki is only available when short pulsing and synergic OFF are selected.

4 Programming schedules

4.3.20 Final wirefeed speed

4.3.20 Final wirefeed speed

Description	
	Final wirefeed speed is the wire feed speed at the end of the craterfill time.
Adjustment range	
	If this value is lower than the set value for wire feed speed in the current schedule,
	the system will ramp down the speed during the crater filling time.
	Final wirefeed speed cannot be given a higher value than that for wire feed speed
	in the current schedule.
Available	
	Final wirefeed speed is only available when craterfill has been defined.

4.3.21 Final voltage

4.3.21 Final voltage

Description	Final voltage is the final voltage value at the end of the craterfill time.
Adjustment range	The adjustment range for voltage is approximately 8 - 50 V.
Available	Final voltage is only available when short arc fill and synergic OFF are selected.

4.3.22 Final arc length

4.3.22 Final arc length

Description	
	Final arc length is the final arc length value at the end of the craterfill time.
Adjustment range	
	The adjustment range for arc length is approximately 8 - 50.
Available	
	Final arc length is only available when short pulse fill and synergic OFF are selected.

4.3.23 Final pulse current

4.3.23 Final pulse current

Description	
	Final pulse current is the pulse current value at the end of the craterfill time.
Adjustment range	
	The adjustment range is 100 - 600 A.
	If this value is lower than the set value for cutting pulse current in the current schedule, the system will ramp down the pulse current during the craterfill time.
	Final pulse current cannot be given a higher value than that for the pulse current in the current schedule.
Available	
	The schedule component is only used when short pulse fill and synergic OFF are selected.

4 Programming schedules

4.3.24 Final background current

4.3.24 Final background current

Description	
	Final background current is the background current at the end of the craterfill time.
Adjustment range	
	The adjustment range is 12 - 300 A.
	If this value is lower than the set value for background current in the current schedule, the system will ramp down the current during the craterfill time.
	Final background current cannot be given a higher value than that for background current in the current schedule.
Available	
	Final background current is only available when short pulse fill and synergic OFF are selected.

4.3.25 Final frequency

4.3.25 Final frequency

Description	
	Final frequency is the frequency at the end of the craterfill time.
Adjustment range	
	The adjustment range is 38 - 312 Hz.
	If this value is lower than the set value for frequency in the current schedule, the system will ramp down the frequency during the craterfill time.
	Final frequency cannot be given a higher value than that for frequency in the current schedule.
Available	
	Final frequency is only available when short pulse fill and synergic OFF are selected.

4.3.26 Craterfill time

4.3.26 Craterfill time

Description	
·	The craterfill time is the down ramping time at the end of the weld when the robot has stopped at the end position.
Adjustment range	The adjustment range is 0 - 10 seconds.
Available	Craterfill time is only available with short arc fill or short pulse fill

4.3.27 Burnback time

4.3.27 Burnback time

Description

Burnback time is used to prevent the electrode getting stuck in the cooling molten pool once the welding process is complete.

The burnback time is the time the welding current remains on once the wire feeding has stopped.

Adjustment range

The adjustment range is 0 - 1 seconds

Suggested values:	
Aluminium	0.05 sec
Steel	0.05 - 0.13 sec

4.3.28 Final pulse

4.3.28 Final pulse

Description	
Description	Final pulse controls the amplitude of the "pinch off" at the end of the process after the backburn time.
	The high current cuts off the final globule from the wire and forces it into the still liquid molten pool so that the wire is cleaned ready for the next welding operation.
	The value is a percentage value of an internally calculated value based on current and wire type.
Adjustment range	
	The adjustment range is 10 - 120%.
	For thin sheet, a low value must be considered. A high value applies high pressure on the molten pool.
Available	
	Final pulse is only available when the short arc or spray arc method and synergic OFF are selected.

4.3.29 Touch sense current

4.3.29 Touch sense current

Description

The current that must flow between the wire and the material before the power source signals that it has contact.

See ESAB manual for current setting range.



Note

Only applicable to MigRob500 and AristoMig 500 Integrated and similar

4.3.30 Phase time

4.3.30 Phase time

Description		
	Phase time is the time that the power source welds with the individual schedule during Super pulse welding.	
Setting range	The setting range is 1 - 25 ms	
Available		
Available	The phase time is available only if Super pulse is selected as the welding mode.	

5.1 Introduction

5 Predefined synergic lines

5.1 Introduction

Description

There are predefined synergic lines for the power source. The purpose of the synergic lines is to help the user set up a functional welding process.

This chapter contains:

• A description of the geometric welding process that ABB used for development of the synergic lines.



A synergic line is based on data developed in an established laboratory procedure. The welding result from this kind of procedure is not optimised precisely for all actual arc welding applications. If it provides stable, if not yet fully optimised conditions in the initial development stages of the welding process.

If necessary, the user can switch to non-synergic mode to further optimise required schedule components.

5 Predefined synergic lines

5.2 Setting the welding process

5.2 Setting the welding process

Introduction

The geometric conditions used for the settings are:

Cutaway view of the workpiece and welding torch



xx1400001825

90 degree fillet weld in horizontal position. The welding torch is positioned vertically.

Sectional view of the weld path and the welding torch's position



xx1400001826

Sectional view of the weld path and the position of the welding torch.

Settings

Process description	Torch angle in degrees	Electrode extension in mm
Spray arc	15	20
Short arc	15	15
RAPID PROCESS ¹	40	25

Continues on next page

5.2 Setting the welding process Continued

Process description	Torch angle in degrees	Electrode extension in mm
Short-pulsed arc (short pulsing)	15	15

i RAPID PROCESSTM is a trademark owned by Aga Gas AB. Within the framework of the RAPID PROCESS concept, a method using a short-circuiting arc can be employed for very high welding speeds. The synergic lines for short arc welding are extended for the RAPID PROCESS field.

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6.1 Load the .sid file

6 Rapid command *Load

6.1 Load the .sid file

Introduction

The RAPID command *Load is used to load the .sid file from a storage medium to the memory in the power source.



- Arci (Arcitec IRC5)
- MigRob (MigRob 500)
- AristoMig (AristoMig 500 Integrated)

Example

*Load "HOME:/AWdata.sid" \UnitName:="B_AW_PROC_40";

All the schedules in the file AWdata.sid in the HOME directory are loaded in to the schedule memory on the power source with the I/O unit name $B_{AW}_{PROC}_{40}$.

Argument *Load FileName \UnitName FileName Data type: string The file name. UnitName Data type: string The unit name. The standard name is specified in PROC in CFG. Example Use *Load at the beginning of procedures to load the .sid file. MODULE WELD PROC main part1; part2; ENDPROC PROC part1 ! Loading the schedule from the part1.sid file *Load "HOME:/part1.sid" \UnitName:="B_AW_PROC_40"; . . . ENDPROC PROC part2 ! Loading the schedule from the part2.sid file *Load "HOME:/part1.sid" \UnitName:="B_AW_PROC_40";

. . .

6 Rapid command *Load

6.1 Load the .sid file *Continued*

ENDPROC ENDMODULE

Syntax

```
*Load
```

```
[ FileName ':=' ] < phrase (IN) for string > ';'
[ \UnitName ':=' ] < phrase (IN) for string > ';'
```

Reference document

	Described in:
Saving the .sid file	Instructions - MigRobStore
Setting numeric parameters	Instructions - MigRobTune
Restoring	See Restore schedules on page 49

7 Rapid command *Store



* is valid for

- Arci (Arcitec IRC5)
- MigRob (MigRob 500)
- AristoMig (AristoMig 500 Integrated)

7 Rapid command *Store

7.1 Saving the .sid file

7.1 Saving the .sid file

Introduction	
	The rapid command *Store is used to save all schedules in the MigRob memory to a storage medium
	to a storage medium.
Example	
	*Store "HOME:/AWdata.sid" \UnitName:="B_AW_PROC_40";
	All schedules in the power source with the I/O unit name B_AW_PROC_40 are saved to the AWdata.sid file in the HOME directory. The file extension should be .sid.
Argument	*Store FileName \UnitName
FileName	
	Data type: string
	The file name.
UnitName	
	Data type: string
	The unit name. The standard name is specified in PROC in CFG.
Example	
	Use * Store at the end of procedures to save the .sid file.
	MODULE WELD
	PROC main
	part1;
	part2;
	ENDPROC
	PROC part1
	! Saving the schedule to the partl.sid file
	*Store "HOME:/part1.sid" \UnitName:="B_AW_PROC_40";
	PROC part?
	Saving the schedule to the part2 sid file
	ArciStore "HOME:/part2.sid"
	\UnitName:="B_AW_PROC_41";
	ENDPROC
	ENDMODULE
Syntax	
	*Store
	[FILENAME '.='] < phrase (IN) for string > ';' [\UnitName ':='] < phrase (IN) for string > ':'
	[\UIILINAME ··=] < phrase (IN) for string > ','

7.1 Saving the .sid file Continued

Reference document

	Described in:
Loading the .sid file	Rapid command *Load on page 99
Setting numeric parameters	Instructions - MigRobTune
Manual backup	See Backup schedules on page 48

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8 Rapid command *Tune



* is valid for

- Arci (Arcitec IRC5)
- MigRob (MigRob 500)
- AristoMig (AristoMig 500 Integrated)

8 Rapid command *Tune

8.1 Setting Numeric Schedule Components

8.1 Setting Numeric Schedule Components

Introduction		
	The rapid command $\star_{\tt Tune}$ is used to set the numeric schedule parameters in the power source.	
Example		
	VAR num parid;	
	parid := 20; *Tune\Offset, parid, 0.5;	
	The parameter with the identity of 20 is increased by 0.5.	
Argument		
	*Tune [\Offset] [\Write] Parld Value	
[\Offset]		
	Data type: switch	
	The argument \Offset is used when an increment is to be added in a numeric parameter.	
[\Write]		
	Data type: switch	
	The argument \mbox{Write} is used when a numeric parameter is to be given a new value.	
ParId		
	Data type: num	
	Parameter identity.	
Value		
	Data type: num	
	If the switch argument \Offset is active, the Value argument is an increment added to the existing value of the numeric parameter defined by the ParId argument. The increment can be positive or negative.	
	If the switch argument $\forall write$ is active, the Value argument is the new value of the numeric parameter defined by the ParId argument.	
UnitName		
	Data type: string	
	The unit name. The standard name is specified in PROC in CFG.	
Example		
	Use two programmable buttons for the settings (one to increase and one to rec	
	parameter values). You can configure which signals and buttons you want to link	
	!Global parameter declaration num parid;	
Continues on nex	xt page	
106	Application manual - Programming Integrated Power Source 3HAC050972-001 Revision: B	

8.1 Setting Numeric Schedule Components Continued

```
PROC main
    ! Method for determining parameter identity
   SetUpParId(parid);
    ! Connecting two Trap drivers (simulated) to digital
    inputs
    ! actuated by the programmable buttons.
   CONNECT intnol WITH IncPar;
   ISignalDI, 1, intnol;
   CONNECT intno2 WITH DecrPar;
    ISignalDI, 1, intno2;
    ! Main sequence
    . . .
    ! Switching off the Trap drivers
   IDelete intnol;
   IDelete intno2;
 ENDPROC
  ! Trap driver for increasing the value in steps of 0.5
 TRAP IncPar
    *Tune\Offset, parid, 0.5;
 ENDTRAP
  ! Trap driver for reducing the value in steps of 0.5\,
 TRAP IncPar
    *Tune\Offset, parid, -0.5;
 ENDTRAP
ENDMODULE
```

Syntax

*Tune

```
'une
[ '\'Offset',' ] | [ '\'Write',' ]
[ ParId ':=' ] < phrase (IN) for num > ','
[ Value ':=' ] < phrase (IN) for num > ';'
[ '\'UnitName ':=' ] < phrase (IN) for string> ';'
```

Reference document

	Described in:
Saving the .sid file	Rapid command *Store on page 101
Loading the .sid file	Rapid command *Load on page 99

This page is intentionally left blank
Index

D

danger levels, 11

S safety, 9 signals, 11 signals in manual, 11 symbols, 11 safety signals in manual, 11 signals safety, 11 symbols safety, 11



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