

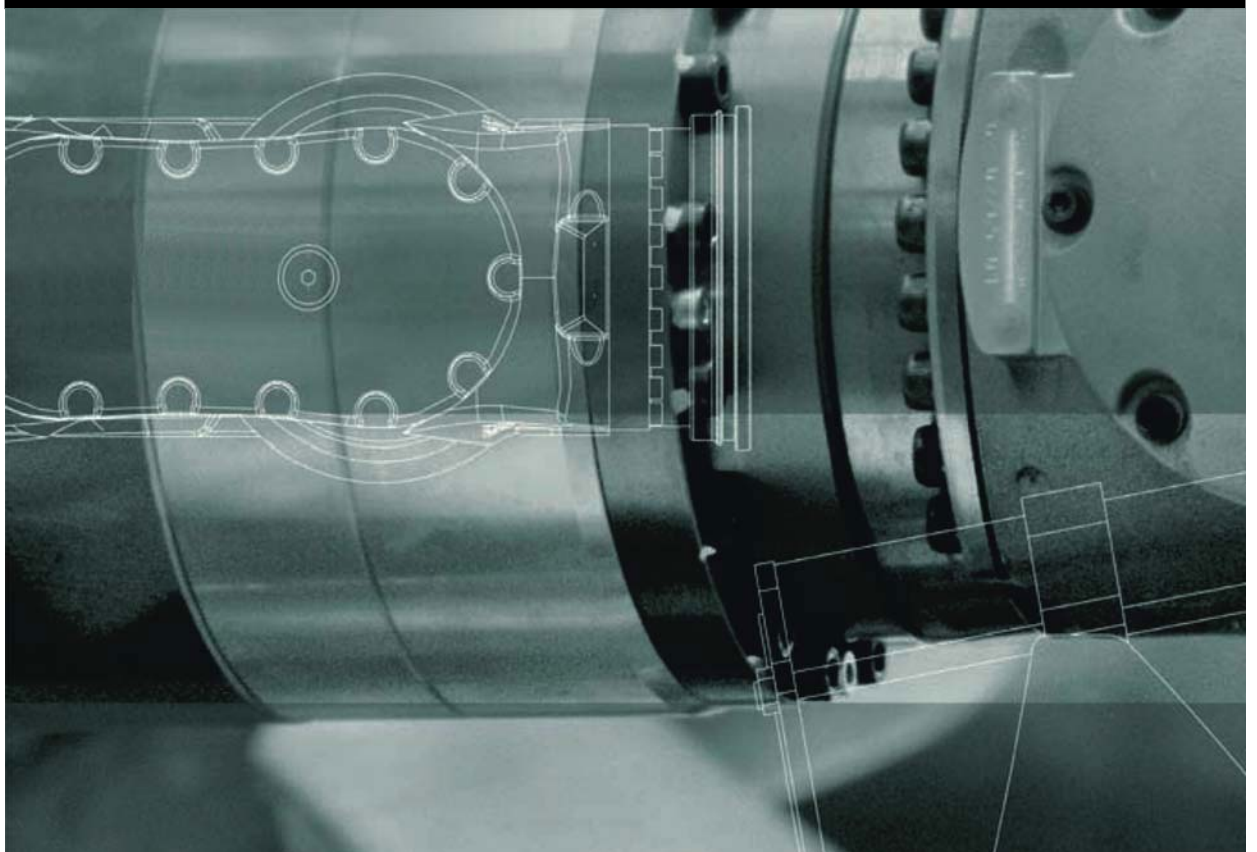
KUKA

KUKA System Technology

KUKA Roboter GmbH

KUKA.EqualizingTech 1.0

For KUKA System Software 8.2



Issued: 14.12.2011

Version: KST EqualizingTech 1.0 V2 en

© Copyright 2011

KUKA Roboter GmbH
Zugspitzstraße 140
D-86165 Augsburg
Germany

This documentation or excerpts therefrom may not be reproduced or disclosed to third parties without the express permission of KUKA Roboter GmbH.

Other functions not described in this documentation may be operable in the controller. The user has no claims to these functions, however, in the case of a replacement or service work.

We have checked the content of this documentation for conformity with the hardware and software described. Nevertheless, discrepancies cannot be precluded, for which reason we are not able to guarantee total conformity. The information in this documentation is checked on a regular basis, however, and necessary corrections will be incorporated in the subsequent edition.

Subject to technical alterations without an effect on the function.

Translation of the original documentation

KIM-PS5-DOC

Publication:	Pub KST EqualizingTech 1.0 (PDF) en
Bookstructure:	KST EqualizingTech 1.0 V2.1
Version:	KST EqualizingTech 1.0 V2 en

Contents

1	Introduction	5
1.1	Target group	5
1.2	Industrial robot documentation	5
1.3	Representation of warnings and notes	5
2	Product description	7
3	Installation	9
3.1	System requirements	9
3.2	Installing or updating EqualizingTech	9
3.3	Uninstalling EqualizingTech	9
4	Programming	11
4.1	Programming a weld spot	11
4.2	Programming tip dressing	11
5	KUKA Service	13
5.1	Requesting support	13
5.2	KUKA Customer Support	13
	Index	21

1 Introduction

1.1 Target group

This documentation is aimed at users with the following knowledge and skills:

- Basic knowledge of the industrial robot
- Knowledge of spot welding



For optimal use of our products, we recommend that our customers take part in a course of training at KUKA College. Information about the training program can be found at www.kuka.com or can be obtained directly from our subsidiaries.

1.2 Industrial robot documentation

The industrial robot documentation consists of the following parts:

- Documentation for the manipulator
- Documentation for the robot controller
- Operating and programming instructions for the KUKA System Software
- Documentation relating to options and accessories
- Parts catalog on storage medium

Each of these sets of instructions is a separate document.

1.3 Representation of warnings and notes

Safety

These warnings are relevant to safety and **must** be observed.



DANGER These warnings mean that it is certain or highly probable that death or severe physical injury **will** occur, if no precautions are taken.



WARNING These warnings mean that death or severe physical injury **may** occur, if no precautions are taken.



CAUTION These warnings mean that minor physical injuries **may** occur, if no precautions are taken.



NOTICE These warnings mean that damage to property **may** occur, if no precautions are taken.



These warnings contain references to safety-relevant information or general safety measures. These warnings do not refer to individual hazards or individual precautionary measures.

Notes

These hints serve to make your work easier or contain references to further information.



Tip to make your work easier or reference to further information.

2 Product description

The KUKA.EqualizingTech software is an option belonging to the ServoGun technology packages from KUKA.

ServoGun can be operated with or without EqualizingTech. With EqualizingTech, conventional gun compensation systems are no longer required. This makes it possible to dispense with e.g. the complicated start-up procedures for pneumatic compensation systems.

EqualizingTech results in only minor changes for the user in the operation of the ServoGun technology packages: weld spots and tip dressing points need to be taught in a slightly different way.


In all other respects, operation remains unchanged.

3 Installation

3.1 System requirements

- Software**
- KUKA System Software 8.2
 - A ServoGun technology package from KUKA that is suitable for use with the EqualizingTech option is installed.

3.2 Installing or updating EqualizingTech

 It is advisable to archive all relevant data before updating a software package.

- Preparation**
- Copy the folder with the software from the CD to the USB stick.


NOTICE Recommendation: Use a KUKA stick. Data may be lost if any other stick is used.

- Precondition**
- Expert user group

- Procedure**
1. Connect the USB stick to the robot controller or smartPAD.
 2. In the main menu, select **Start-up > Install additional software**.
 3. Press **New software**. The entry **EqualizingTech** must be displayed in the **Name** column and drive **E:** or **K:** in the **Path** column.
If not, press **Refresh**.
 4. If the specified entries are now displayed, continue with step 5.
If not, the drive from which the software is being installed must be configured first:
 - Click on the **Configuration** button. A new window opens.
 - Select a line in the **Installation paths for options** area.
Note: If the line already contains a path, this path will be overwritten.
 - Press **Path selection**. The available drives are displayed.
 - Select **E:**. (If stick connected to the robot controller.)
Or select **K:**. (If stick connected to the smartPAD.)
 - Press **Save**. The window closes again.
 The drive only needs to be configured once and then remains saved for further installations.
 5. Mark the entry **EqualizingTech** and click on **Install**. Answer the request for confirmation with **Yes**.
 6. Confirm the reboot prompt with **OK**.
 7. Remove the stick.
 8. Reboot the robot controller.

LOG file A LOG file is created under C:\KRC\ROBOTER\LOG.

3.3 Uninstalling EqualizingTech

 It is advisable to archive all relevant data before uninstalling a software package.

- Precondition**
- Expert user group

Procedure

1. In the main menu, select **Start-up > Install additional software**.
2. Mark the entry **EqualizingTech** and click on **Uninstall**. Reply to the request for confirmation with **Yes**. Uninstallation is prepared.
3. Reboot the robot controller. Uninstallation is resumed and completed.

LOG file

A LOG file is created under C:\KRC\ROBOTER\LOG.

4 Programming

NOTICE

Weld spots and tip dressing points that were taught without EqualizingTech having been installed, must not be used with EqualizingTech.
Weld spots and tip dressing points that were taught with EqualizingTech must not be used without EqualizingTech.
The points must be retaught. Damage to the gun or the workpiece may otherwise result.

4.1 Programming a weld spot

Distances The following distances are required for the position of the gun during teaching:

Distance ...	Value
Fixed electrode	No distance from the workpiece; must be in contact with the workpiece.
Gun opening	Must be at least 4 mm away from the negative software limit switch.

Procedure

1. Position the gun on the desired weld spot. Observe the required distances.
2. Select the menu sequence **Commands > Servo Tech > SPOT** and then select the desired motion type.
3. Set the parameters in the inline form.
4. Press **Cmd OK** to save the instruction.



Information about the inline forms can be found in the documentation for the corresponding ServoGun technology package.

Sequence **Program sequence for welding:**

When approaching points, the robot maintains a certain distance from the workpiece so that the fixed electrode does not scrape against the workpiece. The user can configure this distance (for all weld spots for the gun) via the REAL variable EG_TOUCH_DIFF[] in EG_EXTERN.DAT. Default setting: 3 mm.

The actual opening width of the gun at the point is the sum of the taught opening width and this distance.

4.2 Programming tip dressing

Description **TippDress** executes a weld spot without approximate positioning.

The following parameters must be set in the weld timer:

- Dressing time (complete cycle time)
- Cycle without current

NOTICE


Dressing must be performed without weld current. If dressing is carried out with weld current, damage to property is liable to occur.

Distances The following distances are required for the position of the gun during teaching:

Distance ...	Value
Fixed electrode	No distance from the workpiece; must be in contact with the workpiece.
Gun opening	Must be at least 4 mm away from the negative software limit switch.


Precondition


- The thickness of the tip dresser has been determined.

 Information about this can be found in the documentation for the corresponding ServoGun technology package.

Procedure

1. Position the gun on the desired tip dressing point. Observe the required distances.
2. Select the menu sequence **Commands > Servo Tech > TippDress > Servo Tech** or **LIN**.
3. Set the parameters in the inline form. Also enter the thickness of the tip dresser.
4. Press **Cmd OK** to save the instruction.

 Information about the inline forms can be found in the documentation for the corresponding ServoGun technology package.

 After tip dressing, cyclical initialization must be performed.

Sequence**Program sequence for tip dressing:**

The default sequence corresponds to the sequence for welding.

If a different sequence is required for tip dressing, this can be programmed in the subprogram EG_USERDRESS. In order for the robot controller to perform this different sequence, the variable EG_NON_KUKA_DRESS must be set to TRUE.

5 KUKA Service

5.1 Requesting support

Introduction The KUKA Roboter GmbH documentation offers information on operation and provides assistance with troubleshooting. For further assistance, please contact your local KUKA subsidiary.

Info The following information is required for processing a support request:

- Model and serial number of the robot
- Model and serial number of the controller
- Model and serial number of the linear unit (if applicable)
- Version of the KUKA System Software
- Optional software or modifications
- Archive of the software
- Application used
- Any external axes used
- Description of the problem, duration and frequency of the fault

5.2 KUKA Customer Support

Availability KUKA Customer Support is available in many countries. Please do not hesitate to contact us if you have any questions.

Argentina Ruben Costantini S.A. (Agency)
Luis Angel Huergo 13 20
Parque Industrial
2400 San Francisco (CBA)
Argentina
Tel. +54 3564 421033
Fax +54 3564 428877
ventas@costantini-sa.com

Australia Headland Machinery Pty. Ltd.
Victoria (Head Office & Showroom)
95 Highbury Road
Burwood
Victoria 31 25
Australia
Tel. +61 3 9244-3500
Fax +61 3 9244-3501
vic@headland.com.au
www.headland.com.au

Belgium	KUKA Automatisering + Robots N.V. Centrum Zuid 1031 3530 Houthalen Belgium Tel. +32 11 516160 Fax +32 11 526794 info@kuka.be www.kuka.be
Brazil	KUKA Roboter do Brasil Ltda. Avenida Franz Liszt, 80 Parque Novo Mundo Jd. Guançã CEP 02151 900 São Paulo SP Brazil Tel. +55 11 69844900 Fax +55 11 62017883 info@kuka-roboter.com.br
Chile	Robotec S.A. (Agency) Santiago de Chile Chile Tel. +56 2 331-5951 Fax +56 2 331-5952 robotec@robotec.cl www.robotec.cl
China	KUKA Automation Equipment (Shanghai) Co., Ltd. Songjiang Industrial Zone No. 388 Minshen Road 201612 Shanghai China Tel. +86 21 6787-1808 Fax +86 21 6787-1805 info@kuka-sha.com.cn www.kuka.cn
Germany	KUKA Roboter GmbH Zugspitzstr. 140 86165 Augsburg Germany Tel. +49 821 797-4000 Fax +49 821 797-1616 info@kuka-roboter.de www.kuka-roboter.de

France	KUKA Automatismes + Robotique SAS Techvallée 6, Avenue du Parc 91140 Villebon S/Yvette France Tel. +33 1 6931660-0 Fax +33 1 6931660-1 commercial@kuka.fr www.kuka.fr
India	KUKA Robotics India Pvt. Ltd. Office Number-7, German Centre, Level 12, Building No. - 9B DLF Cyber City Phase III 122 002 Gurgaon Haryana India Tel. +91 124 4635774 Fax +91 124 4635773 info@kuka.in www.kuka.in
Italy	KUKA Roboter Italia S.p.A. Via Pavia 9/a - int.6 10098 Rivoli (TO) Italy Tel. +39 011 959-5013 Fax +39 011 959-5141 kuka@kuka.it www.kuka.it
Japan	KUKA Robotics Japan K.K. Daiba Garden City Building 1F 2-3-5 Daiba, Minato-ku Tokyo 135-0091 Japan Tel. +81 3 6380-7311 Fax +81 3 6380-7312 info@kuka.co.jp
Korea	KUKA Robotics Korea Co. Ltd. RIT Center 306, Gyeonggi Technopark 1271-11 Sa 3-dong, Sangnok-gu Ansan City, Gyeonggi Do 426-901 Korea Tel. +82 31 501-1451 Fax +82 31 501-1461 info@kukakorea.com

Malaysia	KUKA Robot Automation Sdn Bhd South East Asia Regional Office No. 24, Jalan TPP 1/10 Taman Industri Puchong 47100 Puchong Selangor Malaysia Tel. +60 3 8061-0613 or -0614 Fax +60 3 8061-7386 info@kuka.com.my
Mexico	KUKA de Mexico S. de R.L. de C.V. Rio San Joaquin #339, Local 5 Colonia Pensil Sur C.P. 11490 Mexico D.F. Mexico Tel. +52 55 5203-8407 Fax +52 55 5203-8148 info@kuka.com.mx
Norway	KUKA Sveiseanlegg + Roboter Bryggeveien 9 2821 Gjøvik Norway Tel. +47 61 133422 Fax +47 61 186200 geir.ulsrud@kuka.no
Austria	KUKA Roboter Austria GmbH Vertriebsbüro Österreich Regensburger Strasse 9/1 4020 Linz Austria Tel. +43 732 784752 Fax +43 732 793880 office@kuka-roboter.at www.kuka-roboter.at
Poland	KUKA Roboter Austria GmbH Spółka z ograniczoną odpowiedzialnością Oddział w Polsce Ul. Porcelanowa 10 40-246 Katowice Poland Tel. +48 327 30 32 13 or -14 Fax +48 327 30 32 26 ServicePL@kuka-roboter.de

Portugal KUKA Sistemas de Automatización S.A.
Rua do Alto da Guerra n° 50
Armazém 04
2910 011 Setúbal
Portugal
Tel. +351 265 729780
Fax +351 265 729782
kuka@mail.telepac.pt

Russia OOO KUKA Robotics Rus
Webnaja ul. 8A
107143 Moskau
Russia
Tel. +7 495 781-31-20
Fax +7 495 781-31-19
kuka-robotics.ru

Sweden KUKA Svetsanläggningar + Robotar AB
A. Odhners gata 15
421 30 Västra Frölunda
Sweden
Tel. +46 31 7266-200
Fax +46 31 7266-201
info@kuka.se

Switzerland KUKA Roboter Schweiz AG
Industriestr. 9
5432 Neuenhof
Switzerland
Tel. +41 44 74490-90
Fax +41 44 74490-91
info@kuka-roboter.ch
www.kuka-roboter.ch

Spain KUKA Robots IBÉRICA, S.A.
Pol. Industrial
Torrent de la Pastera
Carrer del Bages s/n
08800 Vilanova i la Geltrú (Barcelona)
Spain
Tel. +34 93 8142-353
Fax +34 93 8142-950
Comercial@kuka-e.com
www.kuka-e.com

South Africa	Jendamark Automation LTD (Agency) 76a York Road North End 6000 Port Elizabeth South Africa Tel. +27 41 391 4700 Fax +27 41 373 3869 www.jendamark.co.za
Taiwan	KUKA Robot Automation Taiwan Co., Ltd. No. 249 Pujong Road Jungli City, Taoyuan County 320 Taiwan, R. O. C. Tel. +886 3 4331988 Fax +886 3 4331948 info@kuka.com.tw www.kuka.com.tw
Thailand	KUKA Robot Automation (M)SdnBhd Thailand Office c/o Maccall System Co. Ltd. 49/9-10 Soi Kingkaew 30 Kingkaew Road Tt. Rachatheva, A. Bangpli Samutprakarn 10540 Thailand Tel. +66 2 7502737 Fax +66 2 6612355 atika@ji-net.com www.kuka-roboter.de
Czech Republic	KUKA Roboter Austria GmbH Organisation Tschechien und Slowakei Sezemická 2757/2 193 00 Praha Horní Počernice Czech Republic Tel. +420 22 62 12 27 2 Fax +420 22 62 12 27 0 support@kuka.cz
Hungary	KUKA Robotics Hungaria Kft. Fö út 140 2335 Taksony Hungary Tel. +36 24 501609 Fax +36 24 477031 info@kuka-robotics.hu

USA KUKA Robotics Corp.
22500 Key Drive
Clinton Township
48036
Michigan
USA
Tel. +1 866 8735852
Fax +1 586 5692087
info@kukarobotics.com
www.kukarobotics.com

UK KUKA Automation + Robotics
Hereward Rise
Halesowen
B62 8AN
UK
Tel. +44 121 585-0800
Fax +44 121 585-0900
sales@kuka.co.uk

Index

D

Documentation, industrial robot 5

E

EG_NON_KUKA_DRESS 12

EG_TOUCH_DIFF 11

EqualizingTech 11

I

Installation 9

Introduction 5

K

KUKA Customer Support 13

P

Product description 7

Programming 11

Programming, tip dressing 11

R

Required knowledge and skills 5

S

Safety instructions 5

Service, KUKA Roboter 13

Software 9

Support request 13

System requirements 9

T

Target group 5

Training 5

U

Uninstallation, EqualizingTech 9

Update, EqualizingTech 9

W

Warnings 5

