



- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- A

**Translation of the original User Manual**

**Bonder 5330**

**User Guide v6.0**

- 1**
- 2**
- 3**
- 4**
- 5**
- 6**
- 7**
- 8**
- 9**
- A**

F&S Bondtec Semiconductor GmbH  
Industriezeile 49a  
A-5280 Braunau  
Austria

---

Copyright © 2014 F&S Bondtec Semiconductor GmbH  
Right reserved to make technical changes

1

2

3

4

5

6

7

8

9

A

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- A

F&S Bondtec Semiconductor GmbH  
Industriezeile 49a  
A-5280 Braunau  
Austria

---

Copyright © 2014 F&S Bondtec Semiconductor GmbH  
Right reserved to make technical changes

<b>1 GENERAL INFORMATION . . . . .</b>	<b>1-1</b>	
<b>1.1 Applicability of this User Guide . . . . .</b>	<b>1-1</b>	
1.1.1 Manufacturer's address . . . . .	1-1	
1.1.2 Scope of supply . . . . .	1-1	
1.1.3 Nameplate . . . . .	1-2	
1.1.4 Guarantee, warranty and liability . . . . .	1-3	
1.1.5 Copyright. . . . .	1-3	
<b>2 SAFETY AT WORK . . . . .</b>	<b>2-5</b>	
<b>2.1 Symbols and notes on safety . . . . .</b>	<b>2-5</b>	
2.1.1 User Guide . . . . .	2-5	
2.1.2 Warning labels affixed to the machine . . . . .	2-6	
<b>2.2 CE declaration of conformity . . . . .</b>	<b>2-8</b>	
<b>2.3 Manufacturer's designated use . . . . .</b>	<b>2-8</b>	
<b>2.4 Avoiding misuse . . . . .</b>	<b>2-8</b>	
<b>2.5 Residual hazards . . . . .</b>	<b>2-9</b>	
<b>2.6 Protective equipment / personal protective gear . . . . .</b>	<b>2-10</b>	
<b>2.7 Higher-priority notes on safety . . . . .</b>	<b>2-11</b>	
2.7.1 What to do in an emergency . . . . .	2-11	
2.7.2 User Guide . . . . .	2-12	
2.7.3 Personnel qualification . . . . .	2-12	
2.7.4 Obligations undertaken by the purchaser . . . . .	2-13	
2.7.5 Notes on safety for operation. . . . .	2-13	
2.7.6 Work on the electrical system . . . . .	2-14	
2.7.7 Notes on waste disposal. . . . .	2-14	
<b>3 TECHNICAL DATA . . . . .</b>	<b>3-15</b>	
<b>3.1 Ambient conditions. . . . .</b>	<b>3-15</b>	
<b>3.2 Other specifications . . . . .</b>	<b>3-15</b>	
<b>4 MODEL 5330 . . . . .</b>	<b>4-17</b>	
<b>4.1 Description of the bonder . . . . .</b>	<b>4-17</b>	
4.1.1 Method of operation . . . . .	4-17	
4.1.2 The axes of the positioning system . . . . .	4-18	

<u>1</u>
<u>2</u>
<u>3</u>
<u>4</u>
<u>5</u>
<u>6</u>
<u>7</u>
<u>8</u>
<u>9</u>
<u>A</u>

1  
2  
3  
4  
5  
6  
7  
8  
9  
A

- 4.2 The hardware . . . . . 4-18**
- 4.3 The bondhead . . . . . 4-19**
  - 4.3.1 The transducer . . . . . 4-20
  - 4.3.2 The touchdown sensor . . . . . 4-20
  - 4.3.3 The feed-limiter-unit . . . . . 4-21
  - 4.3.4 The wire clamp . . . . . 4-21
  - 4.3.5 The bonding tool. . . . . 4-22
  - 4.3.6 The bondforce. . . . . 4-23
- 4.4 The substrate carrier . . . . . 4-24**
- 5 TRANSPORT AND INSTALLATION . . . . . 5-25**
  - 5.1 Transport / packaging . . . . . 5-25**
  - 5.2 Storage . . . . . 5-25**
  - 5.3 Suitable operating location. . . . . 5-26**
  - 5.4 Preparation work for commissioning . . . . . 5-27**
    - 5.4.1 Unpacking the machine . . . . . 5-27
  - 5.5 Connecting to power supply . . . . . 5-28**
    - 5.5.1 Electrical hazard . . . . . 5-28
- 6 OPERATION . . . . . 6-29**
  - 6.1 Notes on safety . . . . . 6-29**
    - 6.1.1 Safety at work . . . . . 6-29
    - 6.1.2 Operational hazards . . . . . 6-29
    - 6.1.3 Safety device . . . . . 6-30
  - 6.2 Background knowledge: bonding . . . . . 6-31**
    - 6.2.1 Terms used . . . . . 6-31
    - 6.2.2 The bonding procedure . . . . . 6-33
  - 6.3 Software reference . . . . . 6-36**
    - 6.3.1 Main screen. . . . . 6-37
    - 6.3.2 File . . . . . 6-38
    - 6.3.3 Wire Parameter . . . . . 6-41
    - 6.3.4 Tear/Tail Parameter . . . . . 6-45
    - 6.3.5 Use Teach- or Bond Mode . . . . . 6-46
    - 6.3.6 Machine Parameters . . . . . 6-47
    - 6.3.7 Service. . . . . 6-49
    - 6.3.8 Shut Down . . . . . 6-51

<b>6.4</b>	<b>Preparing to bond</b>	<b>6-52</b>	
<b>6.5</b>	<b>Changing the wire spool</b>	<b>6-53</b>	
6.5.1	Replacing the wire spool	6-53	
6.5.2	Cleaning the wire guide	6-54	
6.5.3	Cleaning the wire clamp	6-54	
6.5.4	Threading in the wire	6-55	
<b>7</b>	<b>ERROR MESSAGES</b>	<b>7-57</b>	
<b>7.1</b>	<b>Structure of error messages</b>	<b>7-57</b>	
<b>7.2</b>	<b>Form for fault description</b>	<b>7-58</b>	
<b>8</b>	<b>ADJUSTMENTS</b>	<b>8-59</b>	
<b>8.1</b>	<b>Notes on safety for adjustments</b>	<b>8-59</b>	
<b>8.2</b>	<b>Adjustments at the bondhead</b>	<b>8-60</b>	
8.2.1	Adjusting the wire clamp	8-60	
8.2.2	Calibrate the bondforce	8-62	
8.2.3	Adjusting the touchdown sensor	8-63	
<b>8.3</b>	<b>Adjusting heating</b>	<b>8-64</b>	
8.3.1	Adjusting the temperature	8-65	
<b>9</b>	<b>MAINTENANCE</b>	<b>9-67</b>	
<b>9.1</b>	<b>Notes on safety for maintenance</b>	<b>9-67</b>	
<b>9.2</b>	<b>Cleaning the machine</b>	<b>9-68</b>	
<b>9.3</b>	<b>Movable parts and drive belts</b>	<b>9-68</b>	
<b>9.4</b>	<b>Maintenance work on the bondhead</b>	<b>9-68</b>	
9.4.1	Cleaning the bonding tool	9-68	
9.4.2	Replacing the transducer	9-69	
9.4.3	Cleaning the wire guide	9-69	
9.4.4	Cleaning the wire clamp	9-69	
9.4.5	Replacing the wire clamp	9-70	
9.4.6	Replacing the bonding tool	9-71	
<b>10</b>	<b>APPENDIX</b>	<b>A-73</b>	
<b>10.1</b>	<b>Programming example</b>	<b>A-73</b>	
10.1.1	Generating a new program	A-74	
10.1.2	Load and save a program	A-77	
10.1.3	Teach Single Wire	A-81	
10.1.4	Teach Multi Wire	A-87	
10.1.5	Select Loop Mode and define Values	A-94	

1

2

3

4

5

6

7

8

9

A

**10.2 Your Opinion. . . . . A-96**

**11 INDEX . . . . . I-I**

**1**

**2**

**3**

**4**

**5**

**6**

**7**

**8**

**9**

**A**



## 1 GENERAL INFORMATION

### 1.1 Applicability of this User Guide

#### 1.1.1 Manufacturer's address

F&S Bondtec Semiconductor GmbH

Industriezeile 49a

A-5280 Braunau

Austria

Phone: +43-7722-67 05 2 - 8270

Fax: +43-7722-67 05 2 - 8272

<http://www.fsbondtec.com>

#### 1.1.2 Scope of supply

The scope of supply is:

- Bonder
- Accessories (as listed on delivery note)
- Documentation

**1**

**2**

**3**

**4**

**5**

**6**


**7**

**8**

**9**

**A**

**1.1.3 Nameplate**

		<b>Industriezeile 49a</b>	
		<b>A-5280 Braunau</b>	
<b>Typ:</b>		<b>Baujahr:</b>	
<b>Nennspannung:</b>	<b>(V)</b>	<b>Frequenz:</b>	<b>(Hz)</b>
<b>Nennstrom:</b>	<b>(A)</b>		<b>(kVA)</b>
<b>Serien-Nr.:</b>		<b>Auftrags-Nr.:</b>	
		<b>CE</b>	

- 1**
- 2**
- 3**
- 4**
- 5**
- 6**
- 7**
- 8**
- 9**
- A**

fig. 1 - 1 Nameplate

The nameplate is affixed to the column at the rear right of the bonder. Always quote the serial number in all correspondence relating to service.



fig. 1 - 2 Serial number

The serial number appears again on another, separate plate mounted on the right side of the tower.

### 1.1.4 Guarantee, warranty and liability

The General Terms and Conditions of Sale and Supply of F&S Bondtec invariably apply. A copy of these General Terms and Conditions is placed at the purchaser's disposal on conclusion of the contract or earlier. Claims under guarantee or warranty and claims for liability for personal injury or damage to property are inadmissible if one or more of the following is causal:

- Utilisation of the machine for other than the use as intended by the manufacturer
- Incorrect assembly, commissioning, operation or maintenance
- Non-compliance with the User Guide
- Operation of the machine despite defective or inoperational safety devices or protective facilities
- Post-specification structural alterations
- Post-specification changes to the drive (power, speed, ...)
- Inadequate monitoring of machine components subject to wear
- Incorrect repairs
- Catastrophes, influence of foreign matter and acts of God

Alterations, additions to and conversions of the machine undertaken without the prior approval of F&S Bondtec are strictly prohibited. This also applies to welding operations involving load-bearing components.

Conversions always require the manufacturer's prior written consent. Structural alterations undertaken without prior written consent void your F&S Bondtec warranty.

F&S Bondtec is not liable in any way for third-party components. The corresponding manufacturer is responsible for these types of claims.

### 1.1.5 Copyright

F&S Bondtec retains full copyright to the documentation package and all its parts. No part of these documents may be reproduced, duplicated or transferred in any form whatsoever without the prior and express written consent of F&S Bondtec.

1

2

3

4

5

6

7

8

9

A

## 2 SAFETY AT WORK

### 2.1 Symbols and notes on safety

#### 2.1.1 User Guide

The notational conventions employed to draw the reader's attention to warnings in this User Guide are as follows:



#### **DANGER!**

Failure to comply with this warning may result in serious or fatal injury.



#### **CAUTION**

Failure to comply with this warning may result in minor injury or damage to property.

#### **IMPORTANT**

*Draws attention to tips and useful information that will help extract maximum benefit from the machine.*

Each instruction in this User Guide is indicated by an arrowhead:

- ▶ Read right through this User Guide completely and make sure you understand everything before you start to use the machine.

---

**1**

---

**2**

---

**3**

---

**4**

---

**5**

---

**6**

---

**7**

---

**8**

---

**9**

---

**A**

**2.1.2 Warning labels affixed to the machine**

The warning labels are printed on soft PVC film and are abrasion-resistant, non-fading and resistant to water and weathering. The layout of the warning labels is compliant with ISO 3864-2 and ANSI Z535.4.

**1**

---

**IMPORTANT**

*Warning labels in accordance with the configuration are affixed to the machine. Do not remove the adhesive warning labels and immediately replace labels which have become damaged, faded or illegible. Make sure that the symbols are clean and clearly legible at all times.*

**2**

Note the following self adhesive warning labels affixed to the machine:

**3**



Unplug from mains electricity supply before opening

**4**

**5**



Electric shock hazard warning

**6**

**7**



Moving machinery hazard warning

**8**

**9**



Burn hazard warning

**A**



Crush hazard warning



Risk of injury to the hands warning

**6**



Personal earthing (Earth-Bonding-Point)

1



Protective earth plug (PE)  
symbol 60417-IEC-5019

2

3



Safe operation of the machine

Familiarity with and compliance with the operating instructions and the safety instructions are prerequisites for safe operation of the machine.

4

5

6

7

8

9

A

## **2.2 CE declaration of conformity**

The machine is CE-compliant. The manufacturer has prepared a CE declaration of conformity for this machine and this declaration is included with the machine documentation as an Appendix.

**1**

## **2.3 Manufacturer's designated use**

**2**

Series 53xx bonders from F&S Bondtec are intended and certified for bonding only and for no other purpose.

**3**

---

### **IMPORTANT**

*The manufacturer refuses to accept liability for consequential damage due to incompatibility; errors in installation on the part of and modifications to the structural design by the purchaser void the guarantee.*

**4**

### **Suitable material**

**5**

Depending on the model, the machine is designed only for the materials specified in the purchase-order contract.

**6**

Other usage or usage above and beyond the scope defined above is not use as intended by the manufacturer. F&S Bondtec refuses to accept liability for damage, injury or loss arising from utilisation of the machine or individual machine components for use other than as intended by the manufacturer.

**7**

Use as intended by the manufacturer also includes:

- compliance with all notes, warnings and instructions in this User Guide.
- compliance with the schedule for all inspection and maintenance work.

**8**

## **2.4 Avoiding misuse**

**9**

The manufacturer is unaware of any practicable application for which the system could be misused.

**A**

## 2.5 Residual hazards

### Drives

Loose strands of hair could be caught by or trapped if the machine is operated with the covers removed. Moving machinery hazard.



**D A N G E R !**

Do not work with the machine with long hair hanging loose or when wearing dangling items of jewelry (necklace, chain, etc.). Your hair or jewelry could be trapped in the drive and cause injury.

1

2

3

### Movable parts



**D A N G E R !**

The x-y table (X and Y axes) and substrate holder can cause injury. Crush hazard.

The bondhead can cause injury. Crush hazard.

4

5

6

7

### Hazardous substances

There are no hazardous substances in the machine. Note, however, that the use of hazardous substances might be involved in cleaning (acetone or similar substances).

Always comply with the manufacturer's instructions when handling cleansing agents.

8

9



**D A N G E R !**

Take care when handling pure alcohol or acetone. Always follow the manufacturer's instructions. Keep products well away from the eyes and mouth. If products come into contact with eyes/mouth, rinse thoroughly without delay and consult a doctor.

A

### Heated substrate holder

The temperature for bonding with gold wire must be >100 °C. The substrate is heated through the substrate carrier.



**D A N G E R !**

The substrate carrier becomes very hot when the heating is in use. Burn hazard.



## **2.6 Protective equipment / personal protective gear**

Before starting the machine, always make sure that all protective devices are installed and are in full working order.

It is permissible to remove protective devices only:

- after the machine has been shut down and
- adequately locked to prevent restart.

When shipping subassemblies the purchaser must install the protective devices in the prescribed manner.

The personnel working with the machine do not require personal safety equipment.



**D A N G E R !**

**Keep well clear of exposed parts of the bonder rack when the machine is energised. Electric shock hazard.**

**Operate the machine only with all covers and doors closed. Do not remove covers while the machine is in operation. Moving machinery hazard.**

1

2

3

4

5

6

7

8

9

A

## 2.7 Higher-priority notes on safety

### 2.7.1 What to do in an emergency



fig. 2 - 3 Main switch with emergency stop function

You can stop the machine at any time, regardless of its operating status by actuating the main switch with EMERGENCY STOP function.



#### **CAUTION**

**Faults must be rectified by trained, qualified personell working in compliance with all safety precautions.**

- ▶ Actuate the main switch with EMERGENCY STOP function to bring the machinery to an immediate standstill.
- ▶ Have the fault rectified by authorised personnel.

To restart the bonder after an emergency stop:

- ▶ Eliminate the fault that led to actuation of the EMERGENCY STOP switch.
- ▶ Switch on the main switch.

1

2

3

4

5

6

7

8

9

A

**2.7.2 User Guide**

This User Guide contains important notes on safe operation of the production system and use as intended by the manufacturer. It is, therefore, imperative to read and understand this User Guide in order to work with this production machine.

**1** The User Guide must be kept readily accessible in the immediate vicinity of the machine/plant at all times. The User Guide is part of the machine and must accompany it if it is sold to a third party. Compliance with the User Guide at all times and under all circumstances is mandatory.

**2** The documentation for other-vendor parts is an integral part of the User Guide. Compliance with the notes on safety and other information in the documentation for other-vendor parts is also mandatory.

**3** All local and national rules and regulations concerning safety at work, accident prevention and environmental protection applicable at the bonder's place of use must be obtained by the purchaser. Compliance with said rules and regulations is mandatory.

---

**4 I M P O R T A N T**

*If printed cards are attached to individual components of this machine, they bear instructions compiled after this User Guide went to press: compliance with these instructions, too, is mandatory.*

**5** *Various machine configurations are available, so the system as delivered may not be exactly as illustrated and described in this User Guide.*

**6** *F&S Bondtec reserves the right to update this User Guide without prior notice and to make technical and content changes at any time.*

**7 2.7.3 Personnel qualification**

Only adequately trained persons who have been familiarised with its use are permitted to work with the machine.

**8** Responsibilities must be clearly defined for installation, commissioning, operation, setup, maintenance and repair.

**9** Permit trainees to work on the machine only under the supervision of an experienced person.

All persons charged with the installation, commissioning, operation and maintenance of the machine are responsible

- A**
- to read carefully all notes on safety and warnings in this User Guide.
  - to comply with the regulations relating to work safety and accident prevention.
  - to comply with all safety instructions and warnings on the machine/plant.

#### 2.7.4 Obligations undertaken by the purchaser

The owner-operator/customer must supplement the User Guide with the following:

- National accident-prevention regulations
- Hazardous substances ordinance
- Instructions for environmental protection
- Owner-operator/customer's internal standard operating procedures and safety regulations
- Supervisory and reporting obligations providing for special operational circumstances, e.g. as regards work organisation, work practices and personnel

The purchaser is responsible to allow only such persons to work on the machine as

- have read and understood all notes on safety and warnings in this User Guide and have confirmed their compliance with this requirement by means of their signature.
- are familiar with the applicable work-safety and accident-prevention regulations and have received instruction on using the machine.

Compliance with all safety-related requirements in work practices on the part of the operating personnel must be checked and ascertained at regular intervals.

Personnel responsibilities must be defined for operation, setup, maintenance and repair.

Always check all safety devices and facilities before starting work.

#### 2.7.5 Notes on safety for operation



### **D A N G E R !**

**Keep well clear of the working zone of the machine while the equipment is in operation. Moving machinery hazard.**

**Operate the machine only with all covers correctly installed. Do not remove covers while the machine is in operation. Moving machinery hazard.**

**Do not work with the machine with long hair hanging loose or when wearing dangling items of jewelry (necklace etc.). Your hair or jewelry could get caught by the moveable parts of the machine and cause injury.**

**Always return the bondhead to its home position before penetrating the machine's working zone. Moving machinery hazard.**

**The substrate carrier becomes very hot when the heating is in use. Burn hazard. Do not touch the substrate or the substrate support when the heating is on or while the substrate carrier is still hot.**

**Use suitable tools (e.g. tweezers) to change the substrate while heating is on.**

**Do not touch the flame off electrode during operation. High-voltage hazard. (5310 only)  
Life-threatening hazard for persons with cardiac pacemakers.**

**Take care when handling pure alcohol or acetone. Always follow the manufacturer's instructions. Keep products well away from the eyes and mouth. If products come into contact with eyes/mouth, rinse thoroughly without delay and consult a doctor.**

1

2

3

4

5

6

7

8

9

A



**CAUTION**

Read through this user guide completely before you put the machine into operation.

Do not position the microscope and microscope holder in the working zone of the bondhead. Crash hazard.

1

2

**2.7.6 Work on the electrical system**

3



**DANGER!**

Work on the electricity supply must always be carried out by a trained, qualified electrician in compliance with the applicable electrotechnical rules and regulations.

4

Keep the electrical components correctly covered at all times. Only authorised persons are permitted to access the electrical components.

5

6

Always make sure the machine is disconnected from the mains supply and deenergised before work on potentially live components commences.

7

**2.7.7 Notes on waste disposal**

You must ensure that the machine is disposed of in an environmentally friendly manner and in compliance with all applicable regulations, or contact the manufacturer.

8

9

A

### 3 TECHNICAL DATA

**IMPORTANT**

*The data quoted here are for the basic model. The specifications might differ from those stated, depending on the version ordered.*

#### 3.1 Ambient conditions

Ambient conditions	
Operating temperature	18 - 24.5 °C
Relative humidity	45% +/- 10% abs., no condensation
Supply voltage	115 - 230 V AC
Voltage frequency	50 - 60 Hz
Installed load	230 W
Noise emission (emission level at the workplace: noise level without extraneous noises and noise returned from room)	< 70 dBA
Vacuum	<300 mbar (Ø 6 mm outside)
Compressed air (oil and water in accordance with DIN ISO 8573-1) Grade 2	min. 4,5 bar (6 bar, Ø4mm outside)

#### 3.2 Other specifications

The substrate types and bonding wires are defined in the Purchase Contract. Other specifications – not detailed above – are also defined in the Sales Contract.

1

2

3

4

5

6

7

8

9

A

## 4 MODEL 5330

### 4.1 Description of the bonder

#### 4.1.1 Method of operation

The bonder 5330 from F&S Bondtec is an ultrasonic wedge-wedge bonder for thin aluminium and gold wires. An additional feature of this machine is its ability to bond ribbon wires from 30 - 250  $\mu\text{m}$ ; the angled wire clamp makes this possible.

Designed as a desktop unit, the bonder is fully featured with all components mounted on a base plate. The plate also carries the x-y table is moved by the mechanical manual joystick moves.

The windows-based graphical user interface ensures easy access to a multitude of machine and application parameters. The processes involved in programming are conducted in an interactive dialogue, ensuring reliable operation and a high level of productivity.

The special design of the bondhead and user programmability of all relevant parameters ensure high flexibility in adapting to different materials and applications.

The stereo zoom microscope is ideal for precision adjustment and visual inspection of the bonds, offering magnification of the bond surface and three-dimensional viewing.

---

#### **IMPORTANT**

*The machine configuration is customisable, so the system as delivered may not be exactly as illustrated and described in this User Guide.*

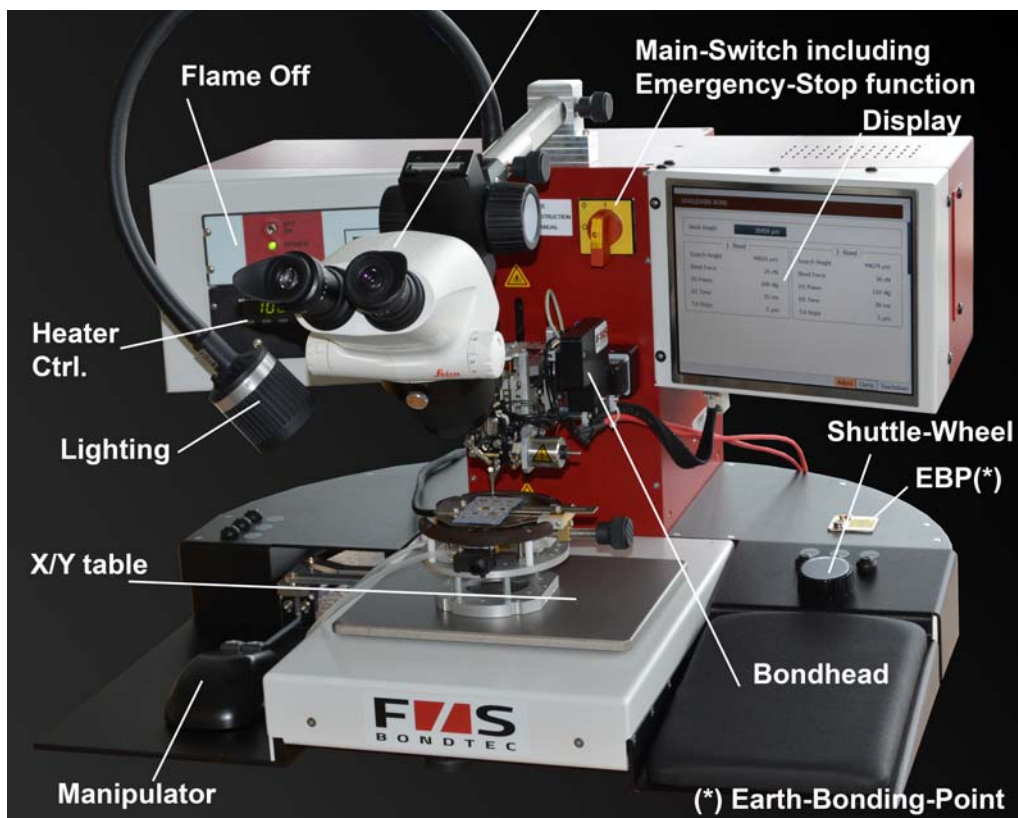


fig. 4 - 4 Description of the bonder

1

2

3

4

5

6

7

8

9

A

### 4.1.2 The axes of the positioning system

- 1
- 2
- 3
- 4**
- 5
- 6
- 7
- 8
- 9
- A



fig. 4 - 5 Working axes

The designations of the working axes are based on the Cartesian system of co-ordinates and are identical to those of the machine's working axes.

- **X/Y Table:** positioning by manual joystick
- **Y axis:** on the bondhead; motor-driven used for loop-motion, cut-motion or tabletear.
- **Z axis:** motor-driven

### 4.2 The hardware

The machine is controlled by an industrial PC using the Windows 7 operating system. The control electronics are located on cards slotted into the right tower side.



### 4.3 The bondhead

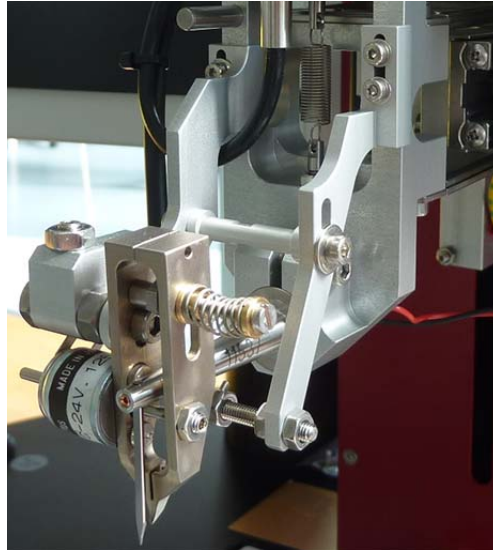


fig. 4 - 6 Bondhead

The complete bondhead moves in the Y- and Z direction.

The bondhead is made up of the following components:

- Transducer, which converts the high-frequency signals from the ultrasonic generator into the mechanical vibration necessary for thermosonic welding (see 4.3.1 "The transducer" on page 4-20).
- Bonding tool, which transfers the oscillations to the bond position (see 4.3.5 "The bonding tool" on page 4-22).
- Wire guide, which guides the bonding wire to the tip of the bonding tool.
- Touchdown sensor, which detects contact between the bonding tool and the substrate (see 4.3.2 "The touchdown sensor" on page 4-20).
- Y-axis for loop movement
- Feed-Limiter-Unit for wire feed
- Wire clamp, to hold the bonding wire during tear off motion after the destination bond (see 4.3.4 "The wire clamp" on page 4-21).

---

1

---

2

---

3

---

**4**

---

5

---

6

---

7

---

8

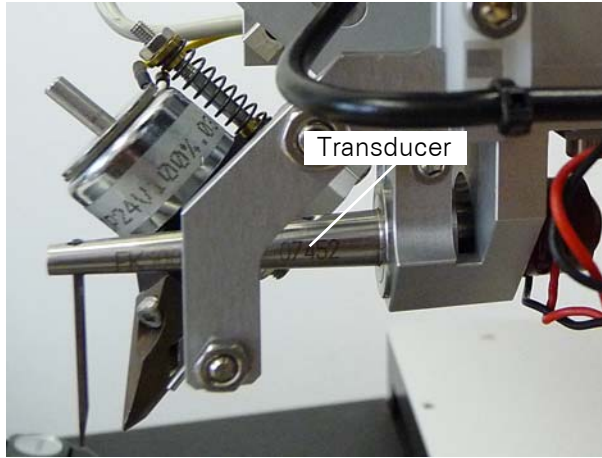
---

9

---

A

**4.3.1 The transducer**



1

2

3

4

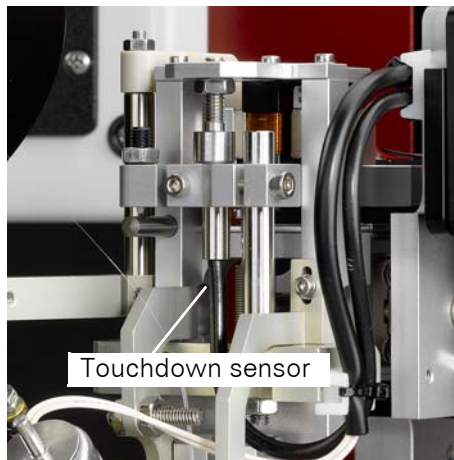
*fig. 4 - 7 Transducer*

The transducer contains the piezos that convert the electrical oscillations generated by the ultrasonic generator into the mechanical vibration necessary for thermosonic welding. The bonding tool transmits these vibrations to the bond point (65, 100, 120 or 140 kHz).

5

6

**4.3.2 The touchdown sensor**



7

8

9

A

*fig. 4 - 8 Touchdown sensor*

The touch-down sensor detects when the bonding tool contacts the substrate.

### 4.3.3 The feed-limiter-unit



fig. 4 - 9 feed limiter unit

The feed-limiter-unit is useful for a constant wire feeding and tear off movement. The taillength is also adjusted mechanically at the feed limiter unit.

### 4.3.4 The wire clamp

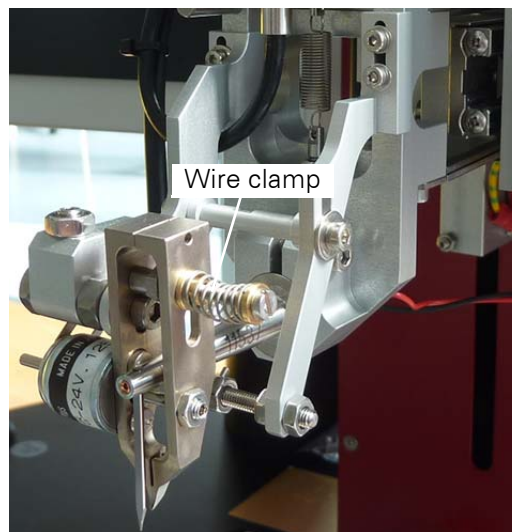


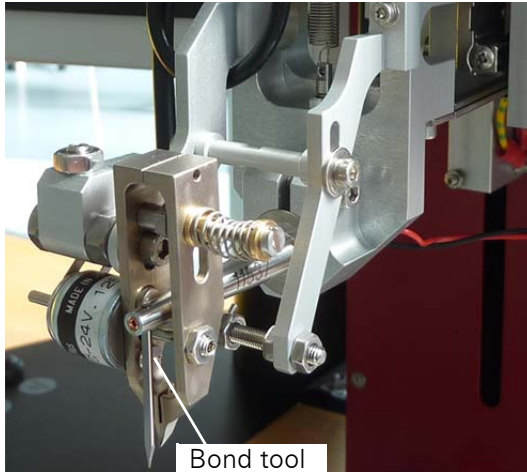
fig. 4 - 10 Wire clamp

- 1
- 2
- 3
- 4**
- 5
- 6
- 7
- 8
- 9
- A

The wire clamp is used to hold the wire while tearing off the wire after the destination bond. It is opened by a solenoid and closed by spring action.

This machine's angled wire clamp enables it to bond ribbon wires from 30 to 250  $\mu\text{m}$ .

**1**  
**4.3.5 The bonding tool**



*fig. 4-11 Bonding tool*

The bonding tool transfers the oscillation required for the welding to the bonding position. The bonding tool has to be selected to suit the bonding wire and the substrate.

In customer-specific special applications, ribbon wire can also be bonded with a wedge. The use of these ribbons can entail modifications to the machine.

#### 4.3.6 The bondforce

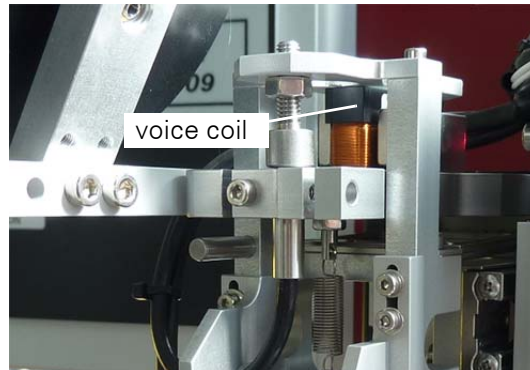


fig. 4 - 12 Bondforce

- A force, programmable in the software for the first and second bond independently of one another, which can be applied in addition via a voice coil motor.

The bond force required for bonding is set as the sum of the mechanical basic force plus the programmable force. i.e. as the force with which the wire is pressed onto the substrate during bonding.

1

2

3

**4**

5

6

7

8

9

A

#### 4.4 The substrate carrier

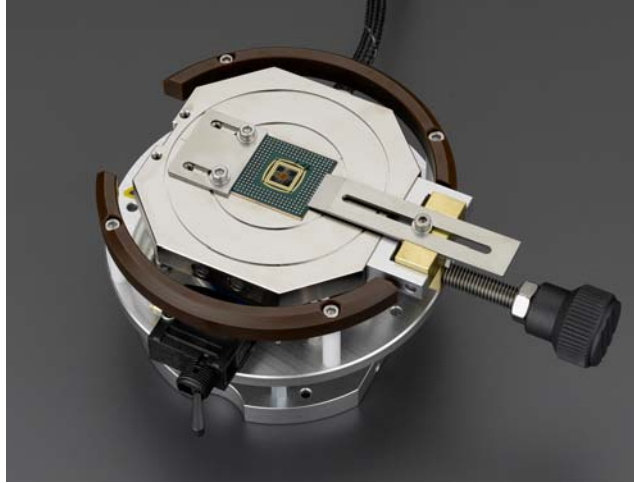


fig. 4-13 Substrate carrier

The substrate carrier is placed on the x-y table and is freely accessible from all sides. The clamp and vacuum allows the substrate to be located anywhere on the substrate holder. Over and above the degrees of freedom allowed by the manual joystick, the substrate holder rotates through 360° for initial positioning and it can also be moved horizontally.

---

**IMPORTANT**

*Chip holders are adapted to the customer-specific application as necessary.*

## 5 TRANSPORT AND INSTALLATION

### 5.1 Transport / packaging

Always repack the equipment in this original packaging for subsequent shipment



**D A N G E R !**

**Make sure the machine is adequately secured for transportation.**

### 5.2 Storage

The preconditions for correct storage are as follows:

- The machine must be fully enclosed within an airtight sealed envelope.
- Storage only in dry rooms at moderate temperature (max. relative humidity: 70%, no condensation, max. temperature range: 0 - 50°C).
- Storage is limited to a maximum of six months.

Although most corrosion-endangered parts are made of non-rusting, chrome-plated or galvanised steel or have a protective paint finish, it is important to check the machine for signs of corrosion if it has been in storage for a prolonged period of time.

It is particularly important to check the condition of all:

- screws, bolts and nuts
- spindles
- guides

---

#### ***IMPORTANT***

*Please consult F&S Bondtec Customer Services if you discover signs of corrosion on the machine.*

1

2

3

4

5

6

7

8

9

A

### 5.3 Suitable operating location

1



**D A N G E R !**

Before the machine is installed, the operator must ensure that the supporting table is of adequate load-bearing capacity.

2

3



**C A U T I O N**

Never attempt to operate the bonder and its components with an incorrect voltage setting. The equipment could be damaged .

4

**5**

The preconditions for correct installation are as follows:

- The system must be readily accessible from all sides.
- Ensure that no-one can be endangered by the machine when it is in operation.
- Use a table of adequate strength for the machine.
- The table should, if possible, transmit no vibrations.
- The workplace should be in compliance with the latest ergonomic guidelines.
- A shockproof socket (to DIN 49441) or a shockproof socket compliant with national requirements must be available in the immediate vicinity of the bonder ([see 3.1 "Ambient conditions" on page 3-15](#)).

6

7

8

9

A



## 5.4 Preparation work for commissioning



### **D A N G E R !**

Wear protective gloves and protective footwear at all times when moving and installing.

1

2

### 5.4.1 Unpacking the machine



### **C A U T I O N**

Take care not to damage the equipment when unpacking it.

3

4

- Place the machine in position.
- Check the shipment and make sure nothing is missing (compare with delivery note).
- Remove the securing device

**5**

6

7

8

9

A

## **5.5 Connecting to power supply**

**1**  **D A N G E R !**

**2** Keep the electrical and electronic components correctly covered at all times. Only authorised personnel may remove the covers.

**3** Always make sure the machine is disconnected from the mains supply and deenergized before work on potentially live components commences, and make sure that the machine is secured in such a way that it cannot be re-energized without your knowledge and consent.

### **4 5.5.1 Electrical hazard**

Work on the electricity supply must always be carried out by a trained, qualified electrician. Always disconnect the machine from the mains supply before work on potentially live components commences. All electric cables must be professionally routed and connected.

**5** Fittings, length and quality of the cables must be in compliance with locally applicable regulations. Have the electrical wiring checked at regular intervals and have loose and damaged cables replaced immediately.

**6**

**7**

**8**

**9**

**A**

## 6 OPERATION

### 6.1 Notes on safety

#### 6.1.1 Safety at work

F&S Bondtec machines are state of the art and comply with safety-related rules and regulations.



#### **D A N G E R !**

Use the machine only

- in compliance with the manufacturer's intended use
- in perfect safety-related working order.

Incorrect use means risk of injury to the user and others and can cause damage to the machine and property. Have safety-related defects repaired immediately by trained, qualified specialists.

#### 6.1.2 Operational hazards



#### **D A N G E R !**

Keep well clear of the working zone of the machine while the equipment is in operation.  
Moving machinery hazard.

Operate the machine only with all covers closed. Do not remove covers while the machine is in operation. Moving machinery hazard.

The substrate carrier becomes very hot when the heating is in use. Burn hazard. Do not touch the substrate or the substrate carrier when the heating is on or while the substrate carrier is still hot.

Use suitable tools (e.g. tweezers) to change the substrate while the heating is on.

Do not work on the machine at the same time as other persons.

---

**1**

---

**2**

---

**3**

---

**4**

---

**5**

---

**6**

---

**7**

---

**8**

---

**9**

---

**A**

6.1.3 Safety device



fig. 6 - 14 Main switch with emergency stop function

You can stop the machine at any time, regardless of its operating status, by actuating the main switch with EMERGENCY STOP function.



**CAUTION**

**Faults must be rectified by trained, qualified personnel working in compliance with all safety precautions.**

- ▶ Actuate the EMERGENCY STOP button to bring the machinery to an immediate standstill.
- ▶ Have the fault rectified by authorised personnel.

To restart the bonder after an emergency stop:

- ▶ Make sure that the fault which led to actuation of the EMERGENCY STOP switch has been rectified.
- ▶ Switch on the main switch.

## 6.2 Background knowledge: bonding

The bonder 5330 is designed for bonding thin gold and thin aluminium wire in the thickness range from 17  $\mu\text{m}$  to 50  $\mu\text{m}$ .

Viewing the component through the microscope enables visual precise positioning of the bonds.

### 6.2.1 Terms used

#### Workheight

Height of the Z position at which the x-y table can be moved, or a component changed, without risk of collision.

#### Bondweight

Programmable bondforce applied during the bonding process.

#### Chips

Each surface to be bonded is known as a 'chip'.

#### Home position

Position for initialising the Z and Y axis.

#### Loop Height

Height of the bonding tool above the substrate at which the loop is formed.

#### Loop Length

Distance between the source and destination bond (also known as 1st and 2nd bonds).

#### Shuttlewheel

Shuttlewheel to alter positions and parameters

#### Search height

Height where touchdown search starts and at which the component is precisely positioned underneath the bonding tool.

#### Z-Delay

Proportion of the loop distance in which Z-axis dwells at loop height while Y-axis is traversing. At the end of Z-Delay the clamp can be closed (see Clamp Flag) and Z-axis traverses down to search height of the 2nd bond.

#### Y-LH Pos

Defines in which position of Y-axis the Z-axis reaches the maximum loop height.

#### Presign

Proportion of the loop height that has been approached after the 1st bond and before the actual loop is drawn. In „Loop Mode“ this function has a different effect depending on the setting.

With „Triangle“ Presign is the height after the 1st bond before the axis traverse in direction Y and draw the loop in the process.

With „Rev. Triangle“ Presign is the height after the 1st bond at which the reserve movement begins.

12345**6**789A

### **Tailheight**

The height at which the tail is formed.

### **Taillength**

The length of wire drawn from or fed out of the bonding tool after the destination bond.

**1**

### **TD (touchdown)**

The bonding tool gets in contact with the material to be bonded.

**2**

### **TD speed**

Speed of the bondhead (Z axis during TD search).

**3**

### **Touchdown threshold**

Sensitivity of the touchdown sensor.

**4**

### **Unplugging tool**

A suitable tool for cleaning the wire duct of the wedge or capillary.

**5**

### **US power (source/destination)**

The programmable power of the ultrasonic generator for the source or destination bond, resp., selectable from 0 to 255 ("low" and "high" amplitudes).

**6**

**7**

**8**

**9**

**A**

### 6.2.2 The bonding procedure

The illustrations below show, in diagrammatic form, how a wire bond is made.

#### Step 1

- The operator positions the chip underneath the bonding tool at the first bond position.

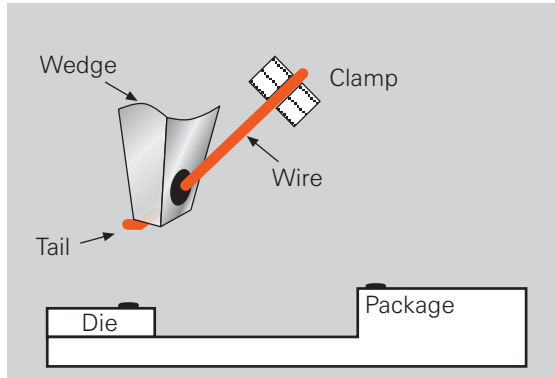


fig. 6 - 15 Bonding procedure - moving to the first bonding position

#### Step 2

- The bondhead brings the wire into contact with the substrate, using a defined force. This force makes the wire ready to be bonded to the substrate by the ultrasonic oscillation.

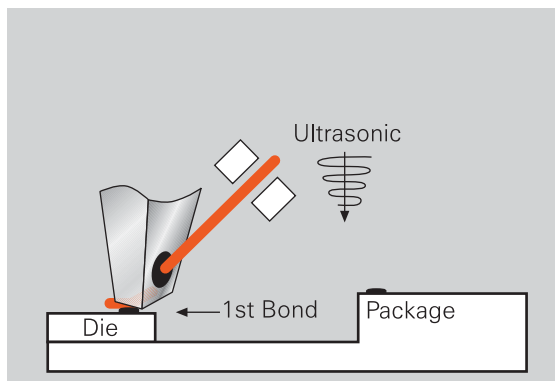


fig. 6 - 16 Bonding procedure - performing the source bond

1  
2  
3  
4  
5  
**6**  
7  
8  
9  
A

**Step 3**

- The wire despoils automatically as the movement to loop height is executed.

- 1
- 2
- 3
- 4
- 5
- 6**
- 7
- 8
- 9
- A

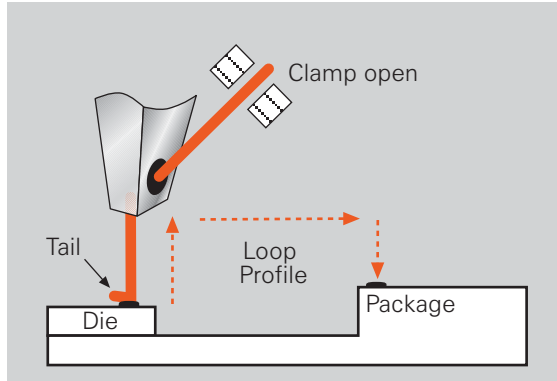


fig. 6 - 17 Bonding procedure - moving to loopheight

**Step 4**

- The Y axis moves the bond head to the second bond position. Tracking this movement, the wire forms the loop.

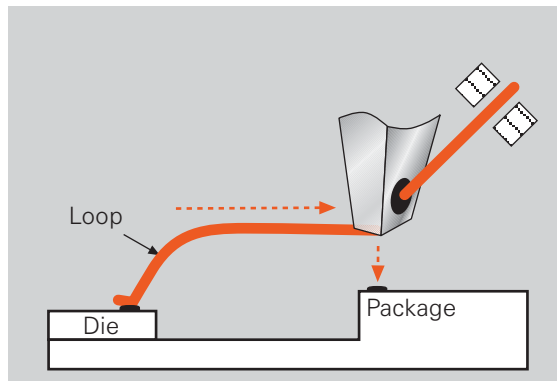


fig. 6 - 18 Bonding procedure - moving to the second bond position



**Step 5**

- The operator positions the chip underneath the bonding tool at the second bond position. At this second bond position, the wire is again brought into contact with the substrate with a defined force, and the wire is ultrasonically welded to the surface.

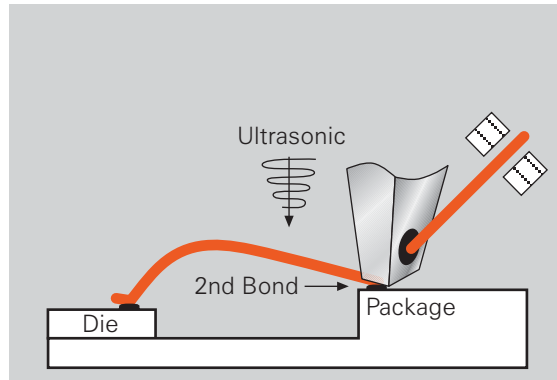


fig. 6 - 19 Bonding procedure - performing the destination bond

**Step 6**

- The movement of the wire clamp tears off the bonding wire. The bondhead returns to the work height.

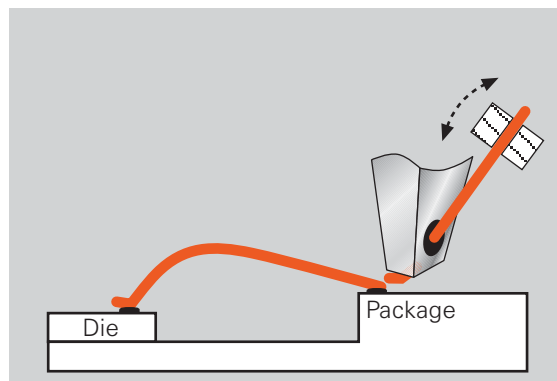


fig. 6 - 20 Bonding procedure - tearing off the wire

**IMPORTANT**

*Extensive knowledge and investigations are necessary, in order to ensure that bonds of this nature exhibit the required characteristics. Broadly speaking, there are three groups of parameters, all of which interact:*

- *Speeds, movements, for example*
- *Process parameters, e.g. bondforce, bond time, ultrasonic energy*
- *Application, e.g. properties of the module, bond wire, clamping at workholder*

1  
2  
3  
4  
5  
**6**  
7  
8  
9  
A

### 6.3 Software reference

**IMPORTANT**

This section describes all menus and their parameters. Read this section carefully and familiarise yourself with its content before you start bonding.

The screen shown below appears after starting the bonder. Select a bond head to start the corresponding software.

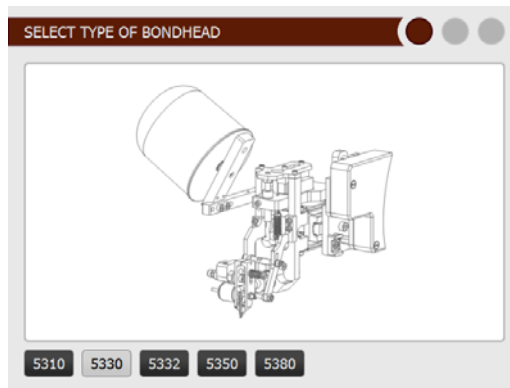


fig. 6 - 21 Selecting the bonder software

➤ Select the software version.

After starting the software, it is possible to load an existing program or to create a new one.

Once the program has started, the axis must be moved to the home position (initialisation position).

➤ Press the "Home" button to move the axis to the initialisation position.

### 6.3.1 Main screen

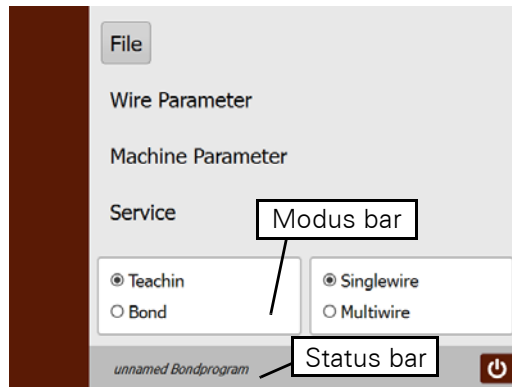


fig. 6 - 22 Main Screen

The menus accessible in the main screen are as follows:

- **File:** (see 6.3.2 "File" on page 6-38)
- **Wire Parameter:** (see 6.3.3 "Wire Parameter" on page 6-41)
- **Machine Parameters:** (see 6.3.6 "Machine Parameters" on page 6-47)
- **Service:**(see 6.3.7 "Service" on page 6-49)
- **Shut Down:** (see 6.3.8 "Shut Down" on page 6-51)

1  
2  
3  
4  
5  
**6**  
7  
8  
9  
A

**Modus bar**

In the modus bar the way of working can be chosen. The name of the currently loaded bond program is displayed at the left-hand side of the status bar.

■ **Teach in/ Bond:**

- Teach In: This is a "Dummy Mode" where all parameters and the bond weight are used and all movements are performed, but without triggering the ultrasonic
- Bond: The wires are trained (and bonded) with the ultrasonic turned on.

■ **Singlewire / Multiwire:**

Selection if one or more wires should be trained.

**6.3.2 File**

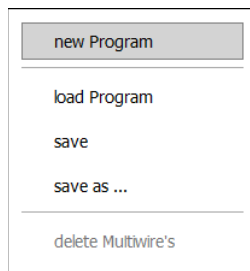


fig. 6 - 23 "File"main menu

- **New Program:** Enter new settings (see "New Program" on page 6-39).
- **Load Program:** Load existing settings from the library (see "Load Program" on page 6-40).
- **Save / Save as:** Save the current settings in the library (see "Save / Save as" on page 6-40).
- **Delete Multiwires:** delete multiwire list.

### New Program

Creates new settings. There is a choice between cloning them from the current program or resetting all values to defaults. .

**IMPORTANT**

*Entries you made beforehand are lost if you did not already save them before you finish creating a new program (by clicking on the OK button)..*

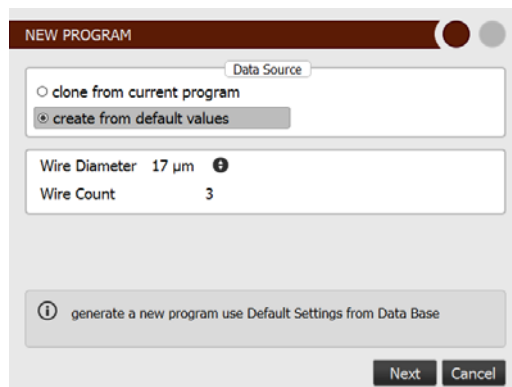


fig. 6 - 24 File > New Program

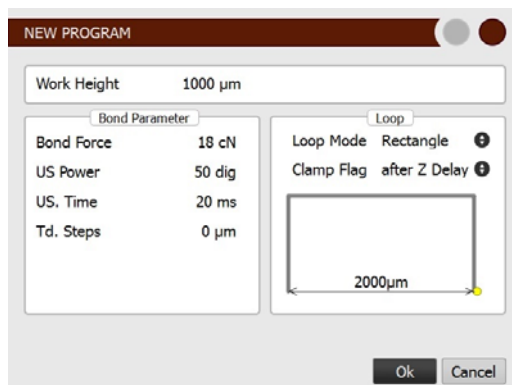


fig. 6 - 25 File > New Program2

- 1
- 2
- 3
- 4
- 5
- 6**
- 7
- 8
- 9
- A

**Load Program**

- 1
- 2
- 3
- 4
- 5
- 6**
- 7
- 8
- 9
- A

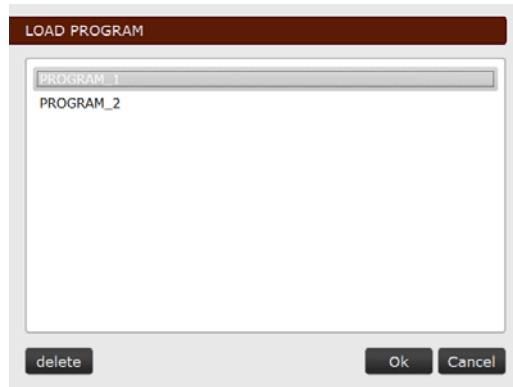


fig. 6 - 26 File > Load

Load existing settings from the library.

► Select a bond program and click on "OK" to confirm. Click on "Cancel" if you do not want to proceed. „delete” allows to remove existing bond programs from the library.

**Save / Save as**

Save a copy of the currently active program in the program library.

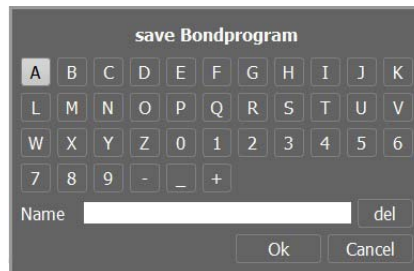


fig. 6 - 27 File > Save / Save as

If you make a mistake, use the „del” button to undo your most recent entry.  
The name of the current bond program appears in the status bar.

**Delete Multiwires**

The multiwire list can be deleted in order to create a new program where the same parameters but different number and shape of wires are used.



fig. 6 - 28 File > delete multiwire

When you open "Wire Parameter" afterward you are asked to create a new multiwire list.  
At this new list all the heights and coordinates have to be stored again then.

### 6.3.3 Wire Parameter

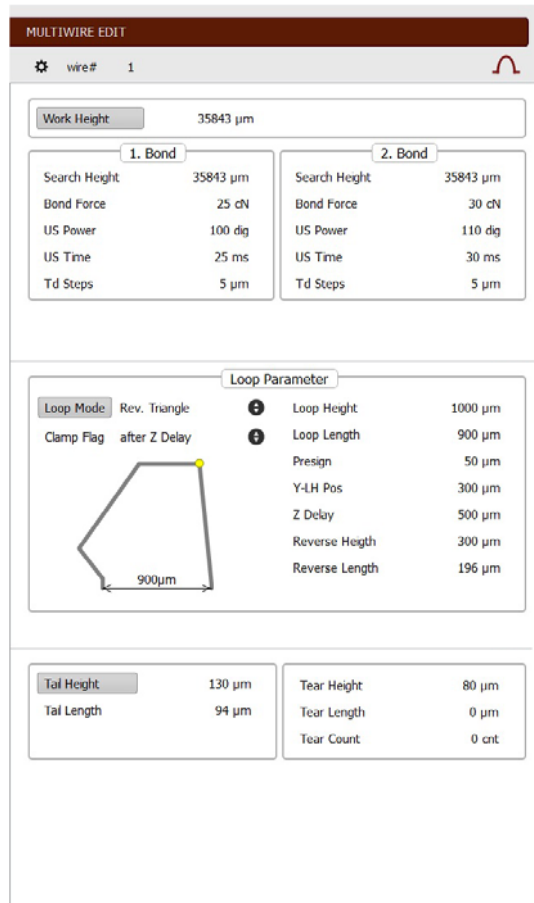


fig. 6 - 29 Main menu - learn wire

Use Multi Wire Mode and bond a wire with parameter teaching.

Parameter (Learn Wire)	Description / Value range, unit
Workheight	Height at which the x-y table can be moved, or a component changed, without risk of collision. $\mu m$
Searchheight	Height before initiating touchdown search. $\mu m$
1. Bondforce / 2. Bondforce	Programmed bondforce applied during the bonding process. $0 \dots 1800 \text{ g}$ or $cN$ (lower values correspond to a lower load).
1. US Power / 2. US Power	Ultrasonic power for the corresponding bond; the correct power setting depends on wire thickness and bond material. $0 \dots 255 \text{ digit}$
1. US Time / 2. US Time	US-time for the corresponding bond. $ms$
1. TD Steps / 2. TD Steps	Additional over-drive steps after touchdown has been detected, to ensure that the wire can be deformed in the bonding process. Default: approx. 0.5 of wire diameter. $0 \dots 500 \mu m$



## Operation

Parameter (Learn Wire)	Description / Value range, unit
Wire Number	Wire index in program.
Wire Name	Name of the active Wire. By pressing the „Enter“-Button on „Wire Name“ a window for naming the wire appears.
Loop Parameter	Loop mode and Loop parameters can be set.

### IMPORTANT

Parameter modifications are only stored by pressing the „Enter“-Button!  
Pushing only the shuttlewheel, merely confirms the modified parameter for the current bond!

- With the „edit“-button, Stitchbonds can be added. Also wires can be renamed, inserted or deleted.

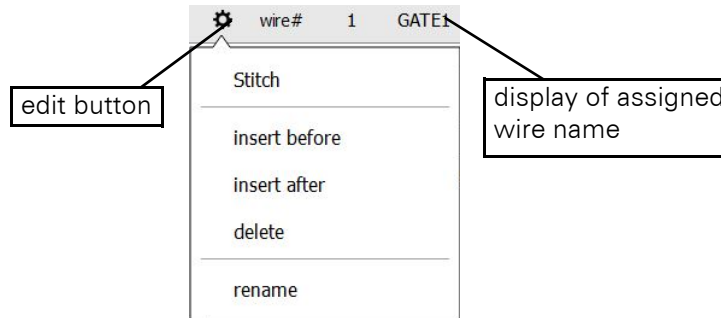


fig. 6 - 30 edit wires

Parameter (edit button)	Description / Value range, unit
Add Stitch	Add a stitch bond
insert before	Insert a chain bond before the current loop
insert after	Insert a chain bond after the current loop
delete	Detete the current wire
rename	Rename the current wire

Moving the cursor up will close the „edit“ page.

### IMPORTANT

Select "Teachin" at the Modus bar (in the Main Menu) to teach or verify the programmed positions and heights without bonding real wires.

The „Teach Mode“ is only activated if „Wire Parameter“ was opened via the selection in the main menu!

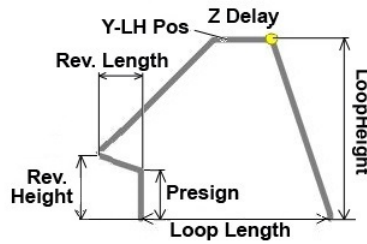
All parameters and the bond weight are used and all movements are executed, but without triggering the ultrasonic!

Creating or deleting wires is also possible!

If „Wire Parameter“ was opened via the „bond“-button, creating or deleting wires is not available!



**Loop Parameters**



Clamp Flag	Clamp parameter <i>after Z-Delay: Clamp closes at loopheight</i> <i>at Search Height: Clamp closes at searchheight 2</i> <i>after Bond: Clamp closes after the destination bond at bond height</i>
Loop Mode	Selection of the loop movement (Rectangular, Triangle, Rev. Triangle)
Reverse Height	Bonding tool height above the substrate at which the reverse move is done. $\mu m$
Reverse Length	Specifies the distance of reverse movement, before the loop is drawn. $cnt/\mu m$
Loop Height	Bonding tool height above the substrate at which the loop is formed. $\mu m$
Loop Length	Distance between the source and destination bond (also known as 1st and 2nd bonds) $cnt/\mu m$
Presign	Proportion of the loop height that has been approached after the 1st bond and before the actual loop is drawn. In „Loop Mode“ this function has a different effect depending on the setting.  With „Triangle“ Presign is the height after the 1st bond, before the axis traverse in direction Y and draw the loop in the process.  With „Rev. Triangle“ Z-Presign is the height after the 1st bond at which the reverse movement begins. This height has an effect depending on how intensely the wire is bent during the reverse movement. This value could also be programmed higher than „Reverse Height“ $\mu m$
Y-LH Pos	Defines in which position of Y-axis the Z-axis reaches the maximum loop height. $\mu m$
Z-Delay	Proportion of the loop distance in which Z-axis dwells at loop height while Y-axis is traversing. At the end of Z-Delay the clamp can be closed (see Clamp Flag) and Z-axis traverses down to TD-Ramp of the 2nd bond. $\mu m$

- 1
- 2
- 3
- 4
- 5
- 6**
- 7
- 8
- 9
- A

**Rectangle**

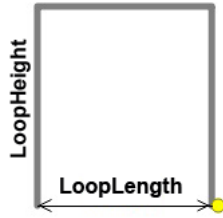


fig. 6 - 31 Rectangle

Rectangular Loop (default); programmable loop height and loop length

**Triangle**

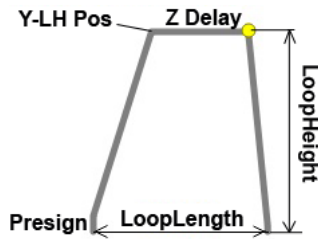


fig. 6 - 32 Triangle

Triangle Loop; simultaneous movement of Z and Y axes.

**Reverse Triangle**

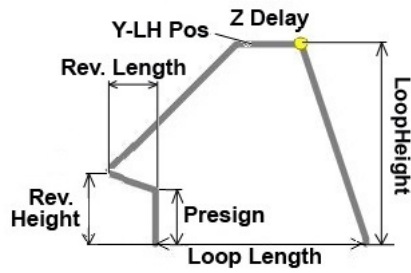


fig. 6 - 33 Reverse Triangle

Reverse Triangle; simultaneous movement of Z-and Y axes with reverse motion.

- 1
- 2
- 3
- 4
- 5
- 6**
- 7
- 8
- 9
- A

### 6.3.4 Tear/Tail Parameter

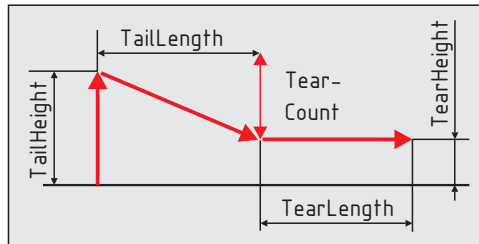


fig. 6 - 34 Table Tear

Parameter (Tear/Cut Parameters)	Description / Value range, unit
Tail height	Height above destination bond $\mu m$
Tail length	Y-movement to tailheight to form the tail length. $counts/\mu m$
Tear height	Height above destination bond at which the wire is torn off. $\mu m$
Tear length	Y-movement to tear the wire at the tear height. $counts/\mu m$
Tear count	Number of vertical movements between „Tear Height“ and „Tail Height“ to weaken the wire before the tear length movement. $counts$

**IMPORTANT**

Pressing the enter key will store parameter changes permanently, whilst pressing the shuttle wheel will store the change just temporary

1  
2  
3  
4  
5  
**6**  
7  
8  
9  
A

### **6.3.5 Use Teach- or Bond Mode**

#### **Single Wire Edit**

➤ Open "Wire Parameters" by using the shuttle wheel

**1**

Changes can be made but will not cause any movement

➤ To store, press "OK" or "Enter".

**2**

➤ To quit, press "Cancel" or "Escape".

**3**

#### **Single Wire Teach-in**

➤ Select "Teach In" at Modus bar (Main Menu)

➤ Push "Bond" button to activate Teach Mode

**4**

Wire can be trained using the shuttle wheel. The movements are performed, except touchdown movement, vacuum and blow-off.

➤ To store, press "Enter".

**5**

➤ To quit, press "Escape".

➤ To leave the window, press "Home".

**6**

#### **Single Wire Bond**

**7**

➤ Select "Bond" at Modus bar (Main Menu)

➤ Push "Bond" button to activate Bond Mode

**8**

Bonding is performed actively. All movements are performed, touchdown is determined; vacuum and blow-off are active.

Parameters can be changed by shuttle wheel.

**9**

➤ To store, press "Enter".

➤ To quit, press "Escape".

➤ To leave the window, press "Home".

**A**

### 6.3.6 Machine Parameters

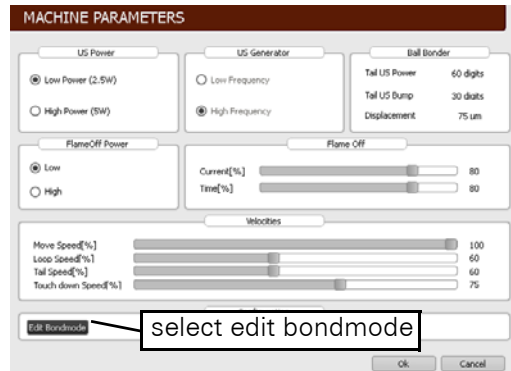


fig. 6 - 35 „Machine Parameters” menu



fig. 6 - 36 Edit Bondmode Configuration

Select „Edith Bondemode” at the machine parameters-menu to open a new window. There you can switch between Adjust Mode and Production Mode. Tag the positions where you want to stop your machine, this is individual adjustable.

Parameter (Machine Parameters)	Description / Value range, unit
<b>US-Power</b>	
Low Power / High Power	Ultrasonic power: Programmed power of the ultrasonic energy needed for the source bond and the destination bond. The correct power setting depends on wire thickness and bond material.  "Low" and "high" levels
<b>US-Generator</b>	

1  
2  
3  
4  
5  
**6**  
7  
8  
9  
A

- 1
- 2
- 3
- 4
- 5
- 6**
- 7
- 8
- 9
- A

<b>Parameter (Machine Parameters)</b>	<b>Description / Value range, unit</b>
Low Frequency / High Frequency	Frequency tuning for a 60 kHz transducer or a 100 kHz transducer. The exact resonance frequency is preset at the factory by F&S Bondtec.  <i>"Low" and "high" levels</i>
<b>Flame off</b>	Adjustments for Flame off (only 5310)
<b>Velocities</b>	
Move Speed	Speed of movement between workheight and search height.  <i>30...100 %</i>
Loop Speed	Speed of Z-movement during the loop as a percentage of maximum speed. No influence on quality  <i>30...100 %</i>
Tail Speed	Speed of movement while the tail is built. No influence on quality  <i>30...100 %</i>
TD Speed	Speed between search height and touchdown.
<b>IMPORTANT</b>	
	<i>The value has to be matched to the thickness of the wire.</i>  <i>30...100 %</i>

### 6.3.7 Service

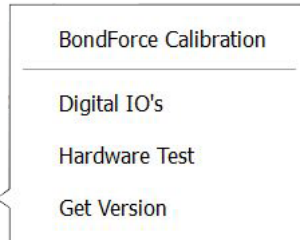


fig. 6 - 37 "Service" main menu

- **Bondforce Calibration:** (password protected)
- **Digital I/O's:**  
(see "Digital I/O's" on page 6-49)
- **HardwareTest:**  
(see "Hardware Test" on page 6-50)
- **Get Version:**  
(see "Get Version" on page 6-50)

#### Bondforce Calibration

(password protected)

Access only for F&S Bondtec service personnel and authorized service.

#### Digital I/O's

Terminal	Logical	Status
IN24_EFO_FAULT	Efo Fault	<input type="radio"/>
LIMIT_Z_MINUS	Z Axis Home	<input checked="" type="radio"/>
LIMIT_Z_PLUS	Z Axis Limit	<input checked="" type="radio"/>
LIMIT_Y_MINUS	Y Axis Home	<input type="radio"/>
LIMIT_Y_PLUS	Y Axis Limit	<input checked="" type="radio"/>
FUSE_24V_Z	Fuse Z Blown	<input checked="" type="radio"/>
FUSE_24V_Y	Fuse Y Blown	<input checked="" type="radio"/>
FUSE_24V_H	Fuse Head Blown	<input checked="" type="radio"/>
FUSE_24V_IO	Fuse IO Blown	<input checked="" type="radio"/>
OUT24_EFO_FIRE	efo Fire	<input type="checkbox"/>
OUT24_VACUUM	vacuum	<input type="checkbox"/>
OUT24_AIR	air	<input type="checkbox"/>
OUT24_FEED	feed	<input type="checkbox"/>

fig. 6 - 38 Service > Digital I/O's

Display of input and output signals.

1  
2  
3  
4  
5  
**6**  
7  
8  
9  
A

Hardware Test

- 1
- 2
- 3
- 4
- 5
- 6**
- 7
- 8
- 9
- A

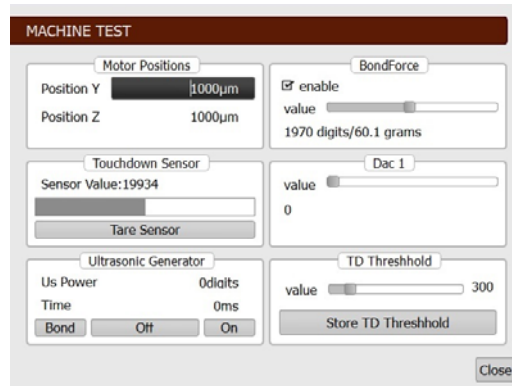


fig. 6 - 39 Service > Hardware Test

- **Motor Position:** use the shuttle wheel to move the axis
- **Touchdown Sensor:** to check the Touchdown-Sensor
- **Ultrasonic Generator:** Allows testing the ultrasonic generator
  - **Bond:** creates an ultrasonic test pulse of programmed duration and power.
  - **On:** enables the ultrasonic permanently with programmed power.
  - **Off:** turns the ultrasonic off.
- **Bondweight:** to check the bondweight
  - **Enable:** Activates or deactivates the bondweight.
  - **Value:** Bondweight setting; higher value cause a higher bond weight.
- **Dac1:** Output current for the rotary solenoid of the flame-off-unit.
- **TD-Treshhold:** sensitivity of TD detection

Get Version

Shows the version numbers of all software modules used.



fig. 6 - 40 Get version 5310



### 6.3.8 Shut Down

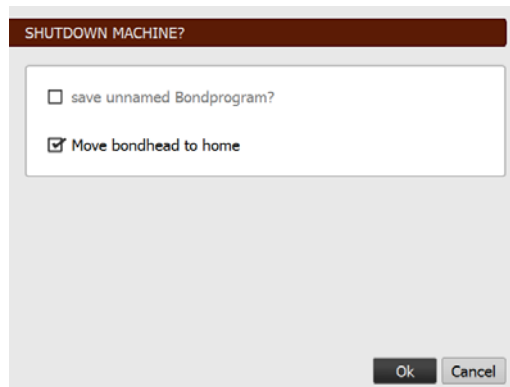


fig. 6 - 41 Shutdown dialog

Shuts down the bonder software as a preliminary to switching off the bonder without loss of data.

- Save the current bond program before executing the 'Shut Down' command (see ["Save / Save as" on page 6-40](#)).

There is also a choice to move the bond head to the "home" position.

- Use the shuttle wheel to select "OK" and then press the shuttle wheel to exit the program. You can also abort the process by selecting "Cancel" (e.g. if you decide you want to save the bonding program before exiting).

---

#### **IMPORTANT**

*Wait until the operating system has shut down before you switch off the bonder.*

- Actuate the main switch.

1

2

3

4

5

**6**

7

8

9

A

## **6.4 Preparing to bond**

Numerous parameters can be set and they are dependent on:

- The thickness of the bonding wire.
- The material
- The surface characteristics of the substrate
- The geometric aspects of the bonding application.

Bear in mind, too, that the bonding parameters influence each other. Increasing ultrasonic power, for example, may mean a shorter ultrasonic duration.

Consequently, there are no hard-and-fast rules for achieving optimum bond quality. Instead, the optimum parameter settings must be found by trial and error. Bear in mind, however, that all parameters can be fine-tuned while bonding production is in progress, and in this way you can maintain optimum bond quality at all times.

Before starting the bonder after installation, repair, or a prolonged outage, always check that the machine is in perfect operating condition and check the settings of the individual components

- 1
- 2
- 3
- 4
- 5
- 6**
- 7
- 8
- 9
- A

## 6.5 Changing the wire spool



### CAUTION

Carefully avoid touching the bonding wire and all wire-carrying components. Even the minute greasy deposits left by the tip of a finger can cause poor bond quality.

### 6.5.1 Replacing the wire spool

#### IMPORTANT

Use only 2" wire spools recommended by F&S Bondtec.

If you change the wire diameter you also have to install the appropriate bonding tool.

#### Removing the wire spool

- Pull the hood off the spool carrier.
- Remove the magnetic clamping washer from the spool carrier.
- If the spool is not empty (e.g. if you are changing to a different wire thickness), cut off the wire at the spool and pull the remaining length of wire out of the wire guide.
- Remove the wire spool.

#### Installing the wire spool

- Place the wire spool on the carrier.
- Install the magnetic clamping washer on the spool carrier.
- Pass the wire through the feeder duct of the spool carrier until the end of the wire emerges at the bottom of the feeder duct.

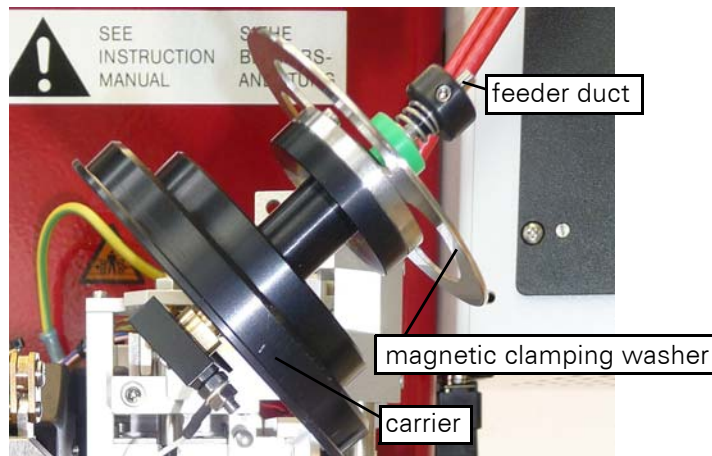


fig. 6 - 42 Feeder duct in spool carrier

#### IMPORTANT

You can use compressed air to help inserting the wire. Spray filtered compressed air into the feeder duct from above.

- 5310 / 5330: Re-install the hood over the spool carrier. Take care not to trap the bonding wire between hood and carrier.

1

2

3

4

5

6

7

8

9

A

### **6.5.2 Cleaning the wire guide**

Clean the wire guide every month.

1



**CAUTION**

**Never use abrasives or scouring powder to clean the wire guide or wire clamp. Pure alcohol or acetone are the most suitable cleansers.**

2

3

- Dip a pipe-cleaner in pure alcohol or acetone.
- Pull the pipe-cleaner repeatedly through the feeder duct and the wire guide tube.
- Pull a dry pipe-cleaner repeatedly through the feeder duct and the wire guide tubes.

4

### **6.5.3 Cleaning the wire clamp**

5

Check the wire clamp for deposits every month and clean as necessary. It is not necessary to remove the wire clamp for this purpose. Use a piece of lint-free paper dipped in pure alcohol for cleaning.

6



**CAUTION**

**Never use abrasives or scouring powder to clean the wire guide or wire clamp. Pure alcohol or acetone are the most suitable cleansers.**

7

8

**Take care when handling pure alcohol or acetone. Always follow the manufacturer's instructions. Keep well away from eyes and mouth. If products come into contact with eyes/mouth, rinse thoroughly without delay and consult a physician.**

9

A

- Press the "clamp" button to open the wire clamp.
- Dip a piece of clean, lint-free paper in pure alcohol or acetone.
- Pull the paper repeatedly back and forth between the jaws of the clamp.
- Slip a piece of clean, dry, lint-free paper between the jaws of the clamp and close the clamp.
- Gently draw the paper out of the clamp.
- Repeat the entire procedure several times.

#### 6.5.4 Threading in the wire

- Feed the end of the wire into the intake of the feed duct.

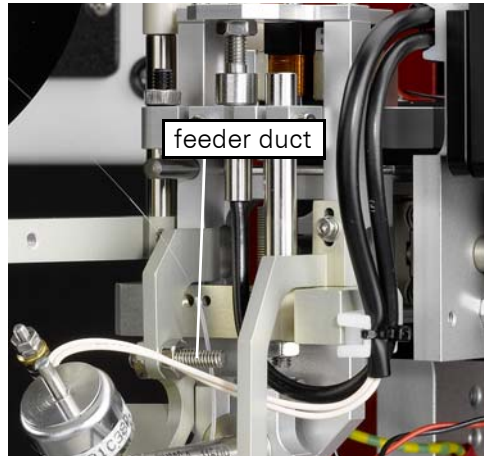


fig. 6 - 43 Wire guide

- Make sure the end of the wire is still straight. Cut off the wire's end if necessary.
- Press the "clamp" button to open the wire clamp.
- Pass the wire through the wire guide above the wire clamp and through the open wire clamp. Then, using tweezers, feed the wire into the bond tool until the end of the wire emerges at the bottom of the bond tool. Unwind a few centimetres of wire to ensure that the wire is not stuck and travels freely.
- Press "wire clamp" to close the wire clamp.
- Cut the wire to the tail length.

---

1

---

2

---

3

---

4

---

5

---

**6**

---

7

---

8

---

9

---

A

## 7 ERROR MESSAGES

### 7.1 Structure of error messages

Error messages appear in a superimposed window. The error is accompanied by a plain-text message detailing the error.

Details about the cause of an Error message can be saved as a txt file.

Message can be sent to F&S for analysis

#### Example



fig. 7 - 44 Error message



#### **CAUTION**

**Faults must be rectified by trained, qualified personnel working in compliance with all safety precautions.**

#### **IMPORTANT**

Contact F&S Bondtec service if an error message is displayed durable. Make a note of the error code of the error message displayed or send the duly completed form for fault description to F&S Bondtec (see 7.2 "Form for fault description" on page 7-58).

1

2

3

4

5

6

7

8

9

A

## 7.2 Form for fault description

Were you unable to rectify the fault?

If so, please complete this form and send it to our Service department:

**Fax: +43-7722-67052-8272**

**Email: service@fsbondtec.at**

1

2

***I M P O R T A N T***

*Copy this page before you fill in the blanks, so that you will have a blank form in case you need one in future.*

3

<b>Type</b>	<b>Serial number</b>
<b>Software version</b>	<b>Bond material</b>
<b>Special equipment</b>	
<b>Your name</b>	<b>Company</b>
<b>Phone</b>	<b>Fax</b>
<b>E-mail</b>	
<b>Description of error</b>	
<b>How often did the error occur?</b>	
<b>What has already been undertaken to rectify the error?</b>	

4

5

6

7

8

9

A

## 8 ADJUSTMENTS

### 8.1 Notes on safety for adjustments



#### **D A N G E R !**

Do not open the case unless the machine is disconnected from the electricity supply.

Switch off the bonder and pull the mains plug before starting work on the flame off electrode. Electric-shock hazard.

Life-threatening hazard for persons with cardiac pacemakers.

Keep well clear of exposed parts of the machine when the machine is energized. Electric shock hazard.

The power supply unit might carry residual voltage after the bonder has been switched off. After switching off the machine wait at least 30 seconds before opening the case of the bonder. Electric shock hazard.

Work on the electricity supply must always be carried out by a trained, qualified electrician in compliance with the applicable electrotechnical rules and regulations.

Keep the electrical components correctly covered at all times. Only authorised persons are permitted to access the electrical components.

Always make sure the machine is disconnected from the mains supply and deenergized before work on potentially live components commences, and make sure that the machine is secured in such a way that it cannot be re-energized without your knowledge and consent.

The halogen bulb reaches very high temperatures and cools only very slowly. Wait for the defective bulb to cool before changing the bulb - burn hazard.



#### **C A U T I O N**

Read this section completely before you start working with the bonder for the first time.

Keep the machine clean at all times. Do not use cleansing agents or lubricants not expressly recommended by F&S Bondtec.

F&S Bondtec recommends having the machine serviced every 2,000 operating hours approximately, or every 2 years at the latest.

Always save the current program with "File > Save" before starting to make adjustments to the bonder.

1

2

3

4

5

6

7

8

9

A



### 8.2 Adjustments at the bondhead

#### 8.2.1 Adjusting the wire clamp

##### 1 Adjusting the gap

2

3

4

5

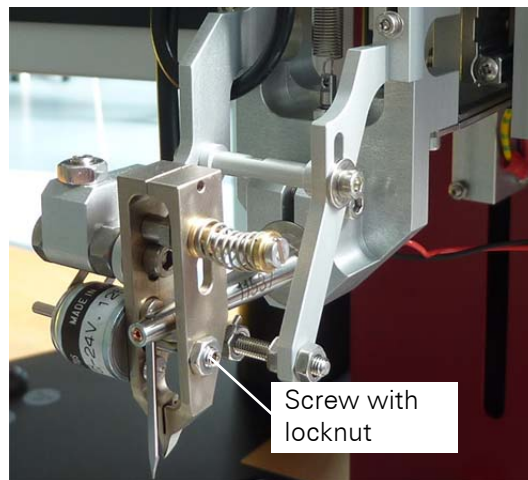


fig. 8 - 45 Screw with locknut of the wire clamp

6

- ▶ Loosen the locknuts of the screws.
- ▶ Set the gap at the clamp to approx 0,1 - 0,2 mm by turning the set screw.
- ▶ Retighten the locknut of the screw.

7

8

9

A

### Adjusting clamp pressure

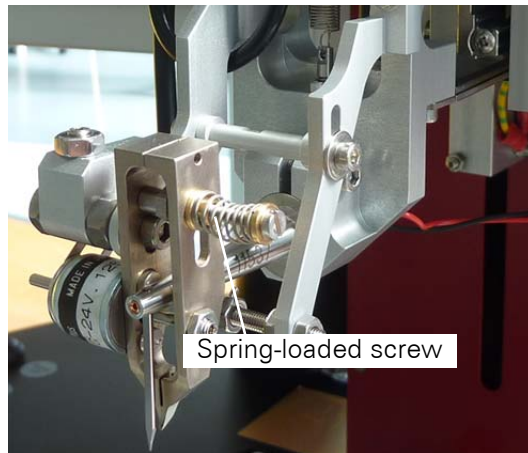


fig. 8 - 46 Spring-loaded screw of the wire clamp

- Adjust the clamp pressure by rotating the nut.
- Use a spring scale to check the clamp pressure. Guidelines value: 100 g. clamp pressure; if necessary correct by rotating the spring-loaded screw.

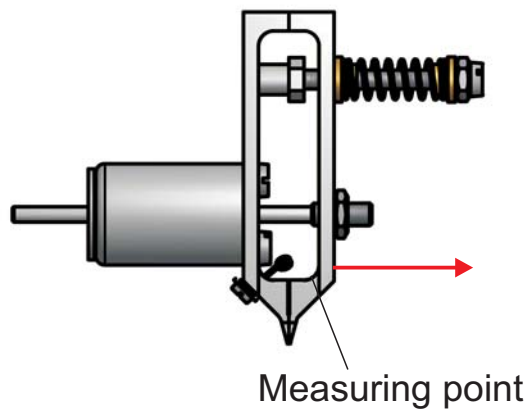


fig. 8 - 47 clamp pressure measuring point

---

#### **IMPORTANT**

Clamp pressure has to be adjusted to suit the wire diameter.  
A change of the by F & S set setting is usually only required when using 50 micron wire or when the wire slips through the closed wire clamp.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8**
- 9
- A

## 8.2.2 Calibrate the bondforce

(Password protected)

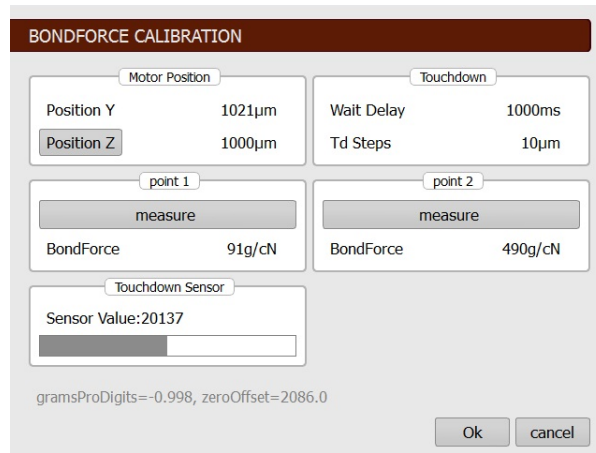


fig. 8 - 48 Bondweight calibration

### IMPORTANT

The mechanical basic force is preset by F&S Bondtec: do not tamper with this setting. Consult F&S Bondtec Service if you have any questions. If, however, the bondforce does have to be set to suit the wire diameter and the surface to be bonded, step through the procedure by following the instructions below. Guideline value: equivalent of wire diameter in grams.

When you calibrate the two fixed points "point 1" and "point 2" you can use a spring scale or a digital measurement unit. Use the spring scale to measure the bondforce at the transducer tip.

The digital measurement unit must be placed below the bondtool so that the machine can do a touchdown during bondweight calibration.

- Call up "Service" > "Bondweight Calibration" and run bondweight calibration for fixed point 1 and point 2 (see "Bondforce Calibration" on page 6-49).
- set Wait delay and TD steps before you perform the calibration

#### Calibrate with measure unit

- put the cursor on "measure" (point 1)
- press the shuttle wheel down to perform a touchdown
- insert the measured value with shuttle wheel
- click on BondForce Button and enter the measured value.
- press the shuttle wheel to exit point 1 calibration
- repeat same procedure at point 2
- press OK to store calibration

#### Calibrate with Spring Scale

- put the cursor to "BondForce" at point 1 and measure the force at tip of transducer (use a spring scale to measure)
- insert the measured value with shuttle wheel
- press the shuttle wheel to exit point 1 calibration
- repeat same procedure at point 2
- press OK to store calibration

### 8.2.3 Adjusting the touchdown sensor

---

**IMPORTANT**

The touchdown sensor is preset by F&S Bondtec: do not tamper with this setting. Consult F&S Bondtec Service if you have any questions.

The sensor is usually mounted flush with the upper edge of the holder.

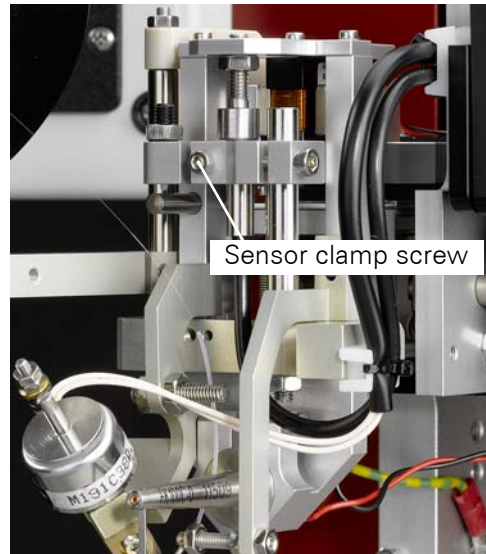


fig. 8 - 49 Sensor clamp screw on the touchdown sensor

---

**1**

---

**2**

---

**3**

---

**4**

---

**5**

---

**6**

---

**7**

---

**8**

---

**9**

---

**A**

### 8.3 Adjusting heating



fig. 8 - 50 Heating

The temperature for bonding with gold wire must be  $> 100\text{ }^{\circ}\text{C}$ . The substrate is heated through the substrate carrier.

#### **! D A N G E R !**

The substrate carrier becomes very hot when the heating is in use. Burn hazard. Do not touch the substrate or the substrate support when the heating is on or while the substrate carrier is still hot.

Use suitable tools (e.g. tweezers) to change the substrate while the heating is on.

#### **ON/OFF control**

Switch on the heater only when required for bonding, in order to avoid the risk of injury by burns. Make sure the heating is switched off for all other activities, such as threading in the bonding wire and cleaning the wire clamp.

#### **IMPORTANT**

After changing the substrate always wait a few minutes before continuing with the bonding process, so that the substrate has time to heat up to temperature at the bond position.

#### **Temperature**

The optimum bond temperature depends on substrate, wire diameter, and other parameters of the bonding application, and must be optimised by trial and error. It is usually in the range between  $100$  and  $200\text{ }^{\circ}\text{C}$ . Switch on the heater and use the buttons to select the temperature. The temperature can be checked on the display.

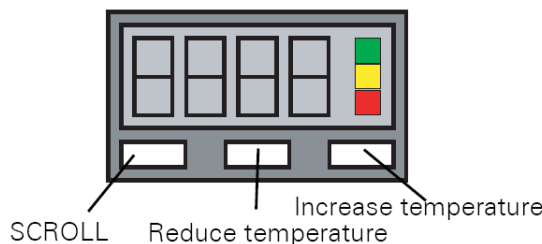


fig. 8 - 51 Temperature setting

**Meanings of the LEDs on the heater controller****■ GREEN:**

- | OFF: Measured value < setpoint
- | ON: Measured value = setpoint
- | Flashing: Measured value > setpoint

**■ YELLOW:**

- | OFF: Normal operation
- | ON: Parameter setting

**■ RED:**

- | Flashing: Only for active alarm

**8.3.1 Adjusting the temperature**

➤ Switch on the heating

Use the SCROLL button to browse the parameters one by one.

When you select a parameter (parameter name appears on the display), wait 1.5 seconds for the value to appear.

The "Reduce temperature" and "Increase temperature" buttons are for setting the temperature.

**Parameter**

The parameters that are displayed and can be adjusted are as follows:

- **PROC:** Temperature measured value (process value) (view-only)
- **SP:** Temperature setpoint (mean value between min. and max. input values)

---

**1**

---

**2**

---

**3**

---

**4**

---

**5**

---

**6**

---

**7**

---

**8**

---

**9**

---

**A**

## 9 MAINTENANCE

### 9.1 Notes on safety for maintenance



#### **D A N G E R !**

Do not open the case unless the machine is disconnected from the electricity supply.

Keep well clear of exposed parts of the machine when the machine is energized. Electric shock hazard.

The power supply unit might carry residual voltage after the bonder has been switched off. After switching off the machine wait at least 30 seconds before opening the case of the bonder. Electric shock hazard.

Work on the electricity supply must always be carried out by a trained, qualified electrician in compliance with the applicable electrotechnical rules and regulations.

Keep the electrical components correctly covered at all times. Only authorised persons are permitted to access the electrical components.

Always make sure the machine is disconnected from the mains supply and deenergized before work on potentially live components commences, and make sure that the machine is secured in such a way that it cannot be re-energized without your knowledge and consent.

The halogen bulb reaches very high temperatures and cools only very slowly. Wait for the defective bulb to cool before changing the bulb - burn hazard.



#### **C A U T I O N**

Keep the machine clean at all times. Do not use cleansing agents or lubricants not expressly recommended by F&S Bondtec.

F&S Bondtec recommends having the machine serviced every 2,000 operating hours approximately, or every 2 years at the latest.

Always save the current program with "File > Save" before starting to carry out maintenance work on the bonder.

1

2

3

4

5

6

7

8

9

A

## 9.2 Cleaning the machine

- ▶ Clean the machine and check it for damage. Use a lint-free cloth dipped in pure alcohol or acetone for cleaning.

### **DANGER!**

Take care when handling pure alcohol or acetone. Always follow the manufacturer's instructions. Keep products well away from the eyes and mouth. If products come into contact with eyes/mouth, rinse thoroughly without delay and consult a doctor.

### **IMPORTANT**

Make sure that the agents used to clean the machine are disposed of in an environmentally friendly manner, particularly if solvents or other chemical agents are used.

## 9.3 Movable parts and drive belts

### **IMPORTANT**

Regularly lubricate movable parts (bearings, shafts, rails) with Gleitmo 585M from Fuchs Lubritech GmbH. Available through F&S Bondtec.  
Only use resin and acid-free oil or grease for lubrication.

## 9.4 Maintenance work on the bondhead

### **DANGER!**

Take care when handling pure alcohol or acetone. Always follow the manufacturer's instructions. Keep products well away from the eyes and mouth. If products come into contact with eyes/mouth, rinse thoroughly without delay and consult a doctor.

### 9.4.1 Cleaning the bonding tool

- ▶ Remove the bonding tool and clean it in accordance with the manufacturer's specifications – in an ultrasonic bath if possible (see 9.4.6 "Replacing the bonding tool" on page 9-71).
- ▶ Blow compressed air into the bonding tool to dry the wire duct.
- ▶ Reinstall the bonding tool (see 9.4.6 "Replacing the bonding tool" on page 9-71).

### **IMPORTANT**

Alternatively, you can use an unplugging tool to clean the wire duct without removing the bonding tool beforehand.



## 9.4.2 Replacing the transducer



**D A N G E R !**

**Switch off the bonder before changing the transducer.**

- Switch off the bonder
- Remove all cable ties along the full length of the transducer cable.
- Disconnect the transducer wires from their terminals.
- Remove the bonding tool ([see 9.4.6 "Replacing the bonding tool" on page 9-71](#)), .
- Release the transducer clamp screw and remove the transducer from its holder.
- Position the new transducer in the transducer holder and clamp it in position.
- Align the front flange of the transducer in such a way that the bonding tool is in its as-delivered position.
- Ensure that the transducer is seated in its holder in such a way that the bonding tool sides are perfectly vertical. Check with a precision square on the mounting plate and, using backlight, check against each side of the bonding tool.
- Retighten the transducer clamp screw to 60 Ncm.
- Reconnect the transducer wires to their terminals.
- Reinstall cable ties to hold the cables in place.

### Adjusting the bonding tool

Ensure that the bonding tool is perfectly vertical. If necessary slacken the transducer clamping screw, correct the angle and retighten the clamping screw to 60Ncm.

The frequency setting at the inbuilt Ultrasonic Generator has to be adjusted to the new resonance frequency of the transducer..

### 9.4.3 Cleaning the wire guide

([see 6.5.2 "Cleaning the wire guide" on page 6-54](#))

### 9.4.4 Cleaning the wire clamp

([see 6.5.3 "Cleaning the wire clamp" on page 6-54](#))

1

2

3

4

5

6

7

8

**9**

A

### 9.4.5 Replacing the wire clamp



**CAUTION**

**1** Switch off the machine before removing or installing the wire clamp. Throughout the procedure described below, take great care to ensure that the fragile wire clamp is not damaged.

**2** The wire clamp is always supplied complete with solenoid.

- ▶ Cut open all cable ties along the full length of the solenoid's connecting cable.
- ▶ Make sufficient notes to ensure that the wires are reconnected in the original configuration and disconnect the solenoid wires from their terminals.
- ▶ Loosen the two clamp securing screws and remove the complete wire clamp.
- ▶ Place the new wire clamp assembly in position and tighten the two securing screws.
- ▶ Reconnect the solenoid connecting wires to the adapter board.
- ▶ Adjust clamp pressure (see ["Adjusting the gap" on page 8-60](#)).
- ▶ Reinstall cable ties to hold the cables in place.

**5**

**6**

**7**

**8**

**9**

**A**

---

#### 9.4.6 Replacing the bonding tool

- Use an Allen key 0.9 mm to loosen the copper clamp screw. Pull the bonding tool down and clear of the transducer.
- Insert the new bonding tool into the transducer from below.
- Align the bonding tool in such a way that the top edge of the bonding tool is flush with the top of the transducer.
- Use a torque wrench to retighten the clamping screw to 18 Ncm.



#### **CAUTION**

**Be sure to install the copper coloured clamp screw as otherwise the transducer will not function correctly.**

---

#### **IMPORTANT**

*Replace the clamping screw every fourth time the bonding tool is changed.*

- adjusting screw defines the height of new cutter. You might have to correct the "Cutheight" parameter after the cutter had been changed.
- 

---

**1**

---

**2**

---

**3**

---

**4**

---

**5**

---

**6**

---

**7**

---

**8**

---

**9**

---

**A**

## A APPENDIX

### A.1 Programming example

This example demonstrates how to generate bond programs for the Series 53xx machines.



#### **CAUTION**

**Working through the programming example is not a substitute for a careful study of the entire User Guide documentation.**

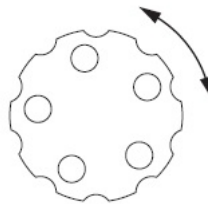
Optimal bonding results are achieved through experience and learning to adjust program-specific bonding parameters, such as bondforce, US-power and US-time.

---

#### **IMPORTANT**

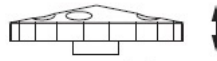
*This example uses real-life values, but do not make the mistake of considering these as default values. On the contrary, the values have to be adjusted every time the material is changed.*

#### **Rotate the Shuttle-wheel**



By rotating the „Shuttle-Wheel“ you can select or choose parameters.

#### **Press down the Shuttle-Wheel**



By pressing the „Shuttle-Wheel“ you can activate or save parameters.

123456789**A**

**A.1.1 Generating a new program**

When creating a new program, all program-specific parameters are set to their default values. Entries made beforehand are lost if not already saved in a bonding program.

1

**IMPORTANT**

While creating a bonding program, pressing the "Home-Key" exits back to the Main-Menu.

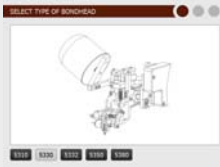
2

Key / Screen	Description / Range, Units
--------------	----------------------------

3

➤ Switch-on the bonder: Main switch "power on" to „I“.

4



➤ Select the software version.

5



A stored Program can be chosen

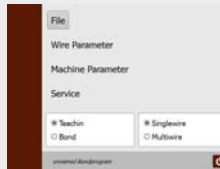
➤ Select „Default“ to create a new program.

6



➤ Press the "Home" Key  
Bondhead moves to Home-position

8



Main-Menu appears on display.

9

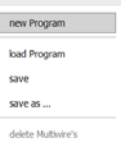
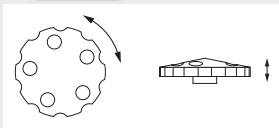
**IMPORTANT**

Basic settings like "Loop-Speed, Move-Speed, TD-Speed..." can only be edited in "Machine-Parameters". They have to be preset!

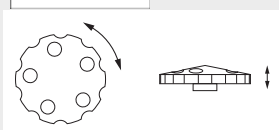
**A**


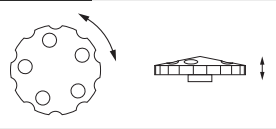

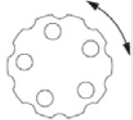


➤ Select "File" by using the "Shuttle-Wheel". Rotate the "Shuttle-wheel" left or right.  
➤ Activate menu item "File".  
Press down the "Shuttle-Wheel" gently.



➤ Select and activate "New Program".

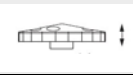
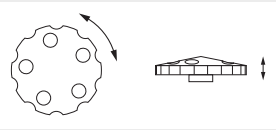
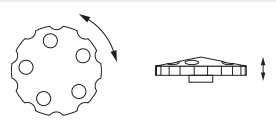
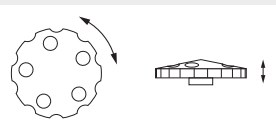


Key / Screen	Description / Range, Units
	<p>If a program was loaded earlier, the settings can be cloned</p> <ul style="list-style-type: none"> <li>➤ Select „create from default values” to generate a new program.</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Set wire diameter and number of wires</li> </ul>
<p><b>Next</b></p> 	<ul style="list-style-type: none"> <li>➤ Select and activate the menu item „Next”.</li> </ul>
 	<p>New Program menu appears on display</p> <ul style="list-style-type: none"> <li>➤ Adjust the "Workheight".</li> </ul> <hr/> <p><b>IMPORTANT</b></p> <p>Make sure the cursor is at the numerical value. You can change the cursor position by pressing down the "Shuttle-Wheel".</p>



**CAUTION**

The "Workheight" has to be set high enough so that the bond tool is always above all components (typically 5 to 10mm above the substrate).  
**Danger of Collision!**

Key / Screen	Description / Range, Units
	<ul style="list-style-type: none"> <li>➤ Store Workheight.</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Select, activate, adjust and store the value for "Bondforce"</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Select, activate, adjust and store the value for "US Power"</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Select, activate, adjust and store the value for "US Time"</li> </ul>

1

2

3

4

5

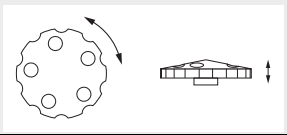
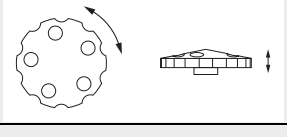
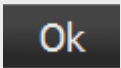

6

7

8

9

**A**



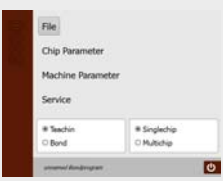
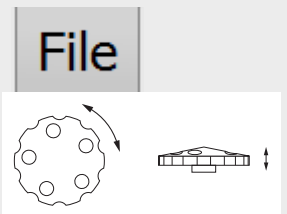
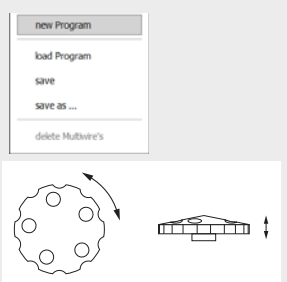
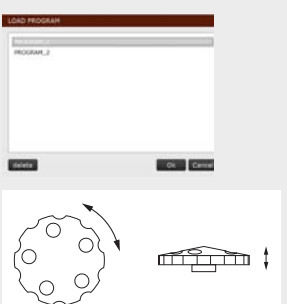
	<b>Key / Screen</b>	<b>Description / Range, Units</b>
<u>1</u>		➤ Select, activate, adjust and store the value for "TD Steps"
<u>2</u>		➤ Select, activate, adjust and store "Loop Mode" and „Clamp Flag” (see "Loop Parameters" on page 6-43)
<u>3</u>		➤ Confirm with "Ok".
<u>4</u>		<i>Start-Menu appears on display.</i>

- 5
- 6
- 7
- 8
- 9
- A**

## A.1.2 Load and save a program

### Load a program

Load a program with preset parameters from the library.

Key / Screen	Description / Range, Units
	<ul style="list-style-type: none"> <li>➤ Switch-on the bonder: Main switch "power on" to "I".</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Select the software version.</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Press the "Home-Key". <i>Bondhead moves to Home-position.</i></li> </ul>
	<p><i>Start-Menu appears on display.</i></p>
	<ul style="list-style-type: none"> <li>➤ Select and activate "File".</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Select and activate "Load Program".</li> </ul>
	<p>Load Program-menu appears on display.</p> <ul style="list-style-type: none"> <li>➤ Rotate the "Shuttle-Wheel" left or right to bring the cursor to the requested program.</li> <li>➤ Select the required program.</li> </ul>

1

2

3

4

5

6

7

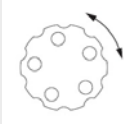

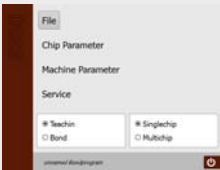
8

9

**A**

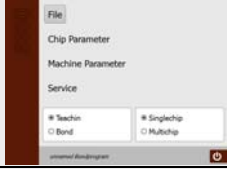
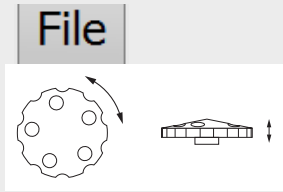
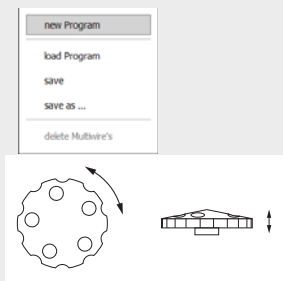
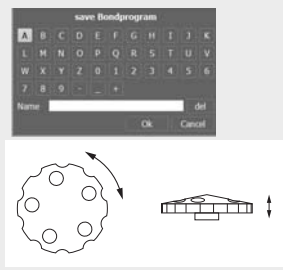
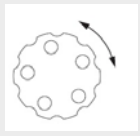

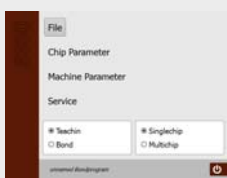


- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- A**

Key / Screen	Description / Range, Units
	<p>➤ Select "OK" or "Cancel".</p> <hr style="border: 1px solid yellow;"/> <p><b>IMPORTANT</b></p> <p>"Cancel" will exit the menu. "delete" will delete the selected program.</p>
	<p>➤ Activate "OK"</p> <p>The required program is loaded.</p>
	<p>Start-Menu appears on display.</p>

### Save a program

Save the current program with the current settings to the library.

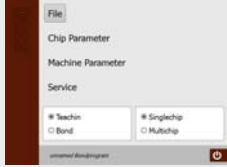

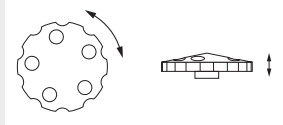
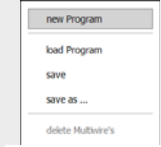
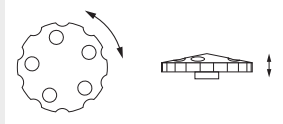

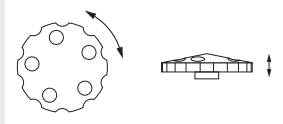
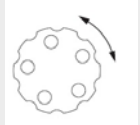

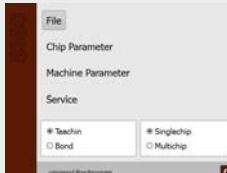
Key / Screen	Description / Range, Units
	Start-Menu appears on display.
	➤ Select and activate menu item "File".
	➤ Select "Save". ➤ Activate menu item "Save". <i>The current settings are saved in the current opened program.</i>
	<i>If a new program has to be stored, a input box appears on display.</i> ➤ Choose the characters by rotating the "Shuttle-Wheel" left or right and pressing it down gently.  <b>IMPORTANT</b> <i>The last character can be deleted by the „del“ button.</i> ➤ Repeat previous steps until the name is completed..
	➤ Select "OK" or "Cancel".  <b>IMPORTANT</b> <i>"Cancel" will exit the menu.</i>
	➤ Activate "OK" to store the program under the new name.
	Start-Menu appears on display.

1  
2  
3  
4  
5  
6  
7  
8  
9  
**A**

**Save a program with a new name**

Save the current program with the current settings to the library.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- A**

Key / Screen	Description / Range, Units
	Start-Menu appears on display.
	➤ Select and activate menu item "File".
	
	➤ Select and activate "Save as".
	
	Save as -Menu appears on display. ➤ Choose the characters by rotating the "Shuttle-Wheel" and pressing it down gently.
	<b>IMPORTANT</b> <i>The last character can be deleted by the „del“ button.</i> ➤ Repeat previous steps until the name is completed.
	➤ Select "OK" or "Cancel". <b>IMPORTANT</b> <i>"Cancel" will exit the menu.</i>
	➤ Activate "OK" to store the program under the new name.
	Start-Menu appears on display.

### A.1.3 Teach Single Wire

#### Teachin Mode (Single Wire)

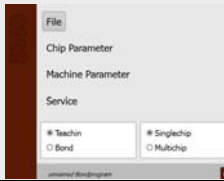
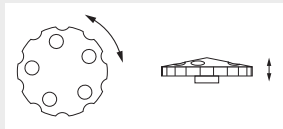
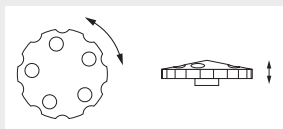

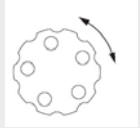
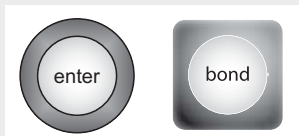
In this mode a wire can be trained.

Note that in this mode, all movements are performed but ultrasonic and flame-off are inactive.

**IMPORTANT**

*If a value is changed by the shuttlewheel and not stored by the "Enter" key, the change is valid only for the currently bonded wire.*

*If the value is changed and confirmed by the "Enter" key, the change is also stored in the bond program and will be valid for all future bonds of this wire.*

Key / Screen	Description / Range, Units
	Start-Menu appears on display.
	➤ Select and activate "Teachin" by using the "Shuttle-Wheel" or the „Mode" button.
	➤ Select and activate "Singlewire" by using the "Shuttle-Wheel".
	➤ Press "Bond-Key" to open the menu item „Teachin".
	➤ Adjust the "Workheight".  <b>IMPORTANT</b> <i>Make sure the cursor is at the numerical value. You can change the cursor position by pressing down the "Shuttle-Wheel".</i>
	➤ To store the value press the „Enter" button. ➤ Move the cursor to the next parameter by pressing the „Bond-Key".

1

2

3

4

5

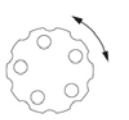
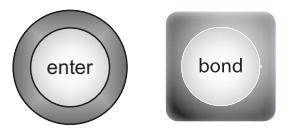
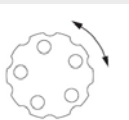
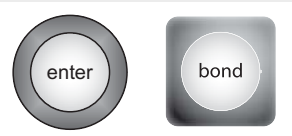
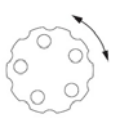
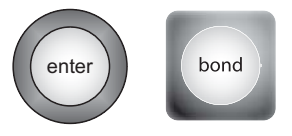
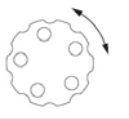
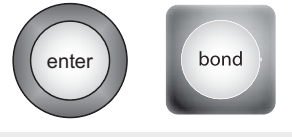
6

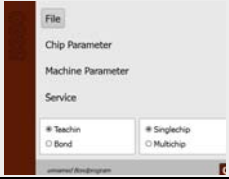
7

8

9

**A**

	<b>Key / Screen</b>	<b>Description / Range, Units</b>
<b>1</b>		<ul style="list-style-type: none"> <li>➤ Adjust the "Searchheight1".</li> </ul>
<b>2</b>		<ul style="list-style-type: none"> <li>➤ To store the value press the „Enter“ button.</li> <li>➤ Move the cursor to the next parameter by pressing the „Bond-Key“.</li> </ul>
<b>3</b>		<hr/> <p><b>IMPORTANT</b></p> <p><i>The bond head moves in the Z direction down until the tool touches!</i></p>
<b>4</b>		<ul style="list-style-type: none"> <li>➤ Adjust the "Loopheight".</li> </ul>
<b>5</b>		
<b>6</b>		<ul style="list-style-type: none"> <li>➤ To store the value press the „Enter“ button.</li> <li>➤ Move the cursor to the next parameter by pressing the „Bond-Key“.</li> </ul>
<b>7</b>		<ul style="list-style-type: none"> <li>➤ Adjust the "Looplength".</li> </ul>
<b>8</b>		
<b>9</b>		<ul style="list-style-type: none"> <li>➤ To store the value press the „Enter“ button.</li> <li>➤ Move the cursor to the next parameter by pressing the „Bond-Key“.</li> </ul>
<b>A</b>		<ul style="list-style-type: none"> <li>➤ Adjust the "Searchheight2".</li> </ul>
		<ul style="list-style-type: none"> <li>➤ To store the value press the „Enter“ button.</li> <li>➤ Move the cursor to the next parameter by pressing the „Bond-Key“.</li> </ul>
		<hr/> <p><b>IMPORTANT</b></p> <p><i>The bond head moves in the Z direction down until the tool touches!</i></p>
		<ul style="list-style-type: none"> <li>➤ If all parameter are set, the cursor moves back to „Workheight“.</li> </ul>
		<ul style="list-style-type: none"> <li>➤ Close the „Teachin“ window by pressing the „Home“ button.</li> </ul>

Key / Screen	Description / Range, Units
	<p><i>Start-Menu appears on display.</i></p>

Other parameters such as "Bondforce" and "TD Steps" can also be changed by selecting them with the shuttlewheel and confirming with "Enter".

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- A**

**Bond Mode (Single Wire)**

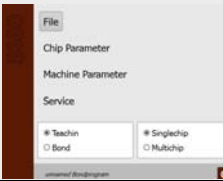
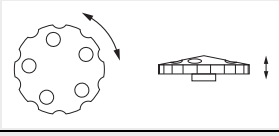
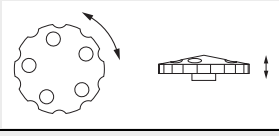
In this mode parameters can be trained. Note that in this mode, all movements are performed and ultrasonic and flame-off are active so that a real bond is made.

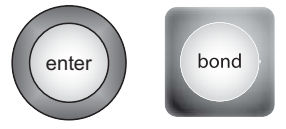
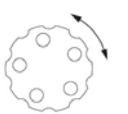

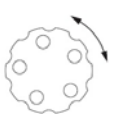
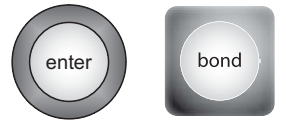
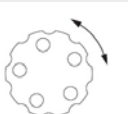


- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- A**

**IMPORTANT**

If a value is changed by the shuttlewheel and not stored by the "Enter" key, the change is valid only for the currently bonded wire.

If the value is changed and confirmed by the "Enter" key, the change is also stored in the bond program and will be valid for all future bonds of this wire.

Key / Screen	Description / Range, Units
	Start-Menu appears on display.
	➤ Select and activate "Bond" by using the "Shuttle-Wheel" or the „Mode" button.
	➤ Select and activate "Singlewire".
	➤ Press "Bond-Key" to open the menu item „Bond".
	➤ Adjust the "Workheight".
<p><b>IMPORTANT</b></p> <p>Make sure the cursor is at the numerical value. You can change the cursor position by pressing down the "Shuttle-Wheel".</p>	
	➤ To store the value press the „Enter" button. ➤ Move the cursor to the next parameter by pressing the „Bond-Key".
	➤ Adjust the "Searchheight1".

Key / Screen	Description / Range, Units	
	<ul style="list-style-type: none"> <li>➤ To store the value press the „Enter“ button.</li> <li>➤ Move the cursor to the next parameter by pressing the „Bond-Key“.</li> </ul> <hr style="border: 1px solid yellow;"/> <p><b>IMPORTANT</b></p> <p><i>The bond head moves in the Z direction down until the tool touches!</i></p>	<u>1</u> <u>2</u>
	<ul style="list-style-type: none"> <li>➤ Adjust the "Loopheight".</li> </ul>	<u>3</u>
	<ul style="list-style-type: none"> <li>➤ To store the value press the „Enter“ button.</li> <li>➤ Move the cursor to the next parameter by pressing the „Bond-Key“.</li> </ul>	<u>4</u> <u>5</u>
	<ul style="list-style-type: none"> <li>➤ Adjust the "Looplength".</li> </ul>	<u>6</u>
	<ul style="list-style-type: none"> <li>➤ To store the value press the „Enter“ button.</li> <li>➤ Move the cursor to the next parameter by pressing the „Bond-Key“.</li> </ul>	<u>7</u> <u>8</u>
	<ul style="list-style-type: none"> <li>➤ Adjust the "Searchheight2".</li> </ul>	<u>9</u>
	<ul style="list-style-type: none"> <li>➤ To store the value press the „Enter“ button.</li> <li>➤ Move the cursor to the next parameter by pressing the „Bond-Key“.</li> </ul> <hr style="border: 1px solid yellow;"/> <p><b>IMPORTANT</b></p> <p><i>The bond head moves in the Z direction down until the tool touches!</i></p>	<u>A</u>
	<ul style="list-style-type: none"> <li>➤ If all parameter are set, the cursor moves back to „Workheight“.</li> </ul>	
	<ul style="list-style-type: none"> <li>➤ Close the „Bond“ window by pressing the „Home“ button.</li> </ul>	
	<p><i>Start-Menu appears on display.</i></p>	

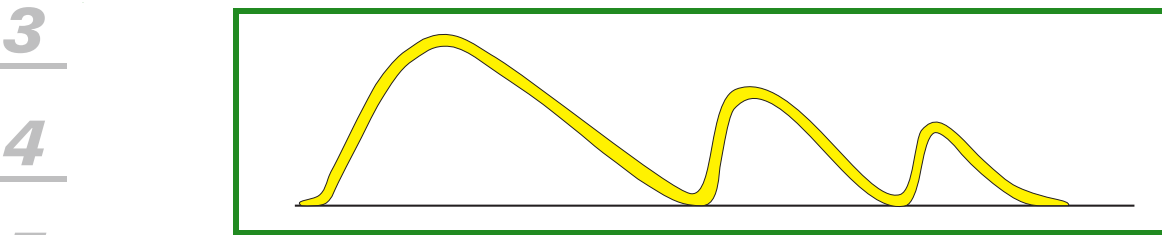


Other parameters such as "Bondforce" and "TD Steps" can also be changed by selecting them with the shuttlewheel and confirming with "Enter".

**Making Stitch bonds**

**1** Stitch bonds or chained bonds are sequential bonds where the wire is not torn off after each destination bond.

**2** Pushing the "Stitch" button once before making the destination bond, the wire is not torn off after the destination bond. The bond head goes back up to the loopheight and another loop can be formed. If a further stitch bond (chained bond) is desired, the "Stitch" button must be pushed again.



**5** fig. A - 52 Stich bond

---

**IMPORTANT**

*The maximum travel of the Y-axis is 25mm!*

**6**

**7**

**8**

**9**

**A**

### A.1.4 Teach Multi Wire

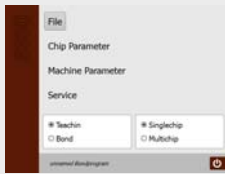
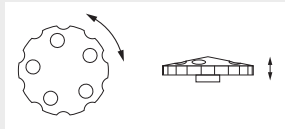
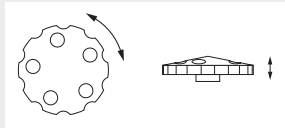

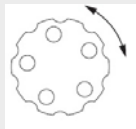

#### Teachin Mode (multi wire)

In this mode wires can be trained. Note that in this mode, all movements are performed but ultrasonic and flame-off are inactive.

#### IMPORTANT

If a value is changed by the shuttlewheel and not stored by the "Enter" key, the change is valid only for the currently bonded wire.

If the value is changed and confirmed by the "Enter" key, the change is also stored in the bond program and will be valid for all future bonds of this wire.

Key / Screen	Description / Range, Units
	Start-Menu appears on display.
	➤ Select and activate "Teachin" by using the "Shuttle-Wheel" or the „Mode" button.
	➤ Select and activate "Multiwire".
	➤ Press "Bond-Key" to open the menu item „Teachin".
	➤ Adjust the "Wire number".
	<ul style="list-style-type: none"> <li>➤ To store the value press the „Enter" button.</li> <li>➤ Move the cursor to the next parameter by pressing the „Bond-Key".</li> </ul>

1

2

3

4

5

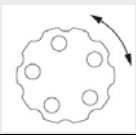
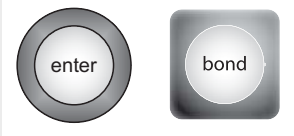
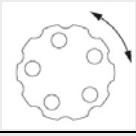
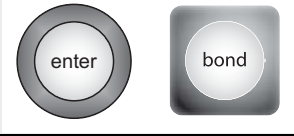
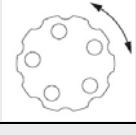
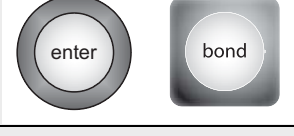
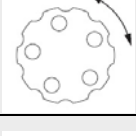

6

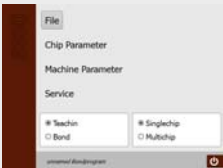
7

8

9

**A**

	Key / Screen	Description / Range, Units
<u>1</u>		<ul style="list-style-type: none"> <li>▶ Adjust the "Searchheight1".</li> </ul>
<u>2</u>		<ul style="list-style-type: none"> <li>▶ To store the value press the „Enter” button.</li> <li>▶ Move the cursor to the next parameter by pressing the „Bond-Key”.</li> </ul>
<u>3</u>		<hr/> <p><b>IMPORTANT</b></p> <p><i>The bond head moves in the Z direction down until the tool touches!</i></p>
<u>4</u>		<ul style="list-style-type: none"> <li>▶ Adjust the "Loopheight".</li> </ul>
<u>5</u>		
<u>6</u>		<ul style="list-style-type: none"> <li>▶ To store the value press the „Enter” button.</li> <li>▶ Move the cursor to the next parameter by pressing the „Bond-Key”.</li> </ul>
<u>7</u>		<ul style="list-style-type: none"> <li>▶ Adjust the "Looplength".</li> </ul>
<u>8</u>		
<u>9</u>		<ul style="list-style-type: none"> <li>▶ To store the value press the „Enter” button.</li> <li>▶ Move the cursor to the next parameter by pressing the „Bond-Key”.</li> </ul>
<u><b>A</b></u>		<ul style="list-style-type: none"> <li>▶ Adjust the "Searchheight2".</li> </ul>
		<ul style="list-style-type: none"> <li>▶ To store the value press the „Enter” button.</li> <li>▶ Move the cursor to the next parameter by pressing the „Bond-Key”.</li> </ul>
		<hr/> <p><b>IMPORTANT</b></p> <p><i>The bond head moves in the Z direction down until the tool touches!</i></p>
		<ul style="list-style-type: none"> <li>▶ If all parameter are set, the cursor moves to „Searchheight1” of the second bond.</li> </ul>
		<ul style="list-style-type: none"> <li>▶ Repeat the previous steps also for other wires.</li> </ul>
		<ul style="list-style-type: none"> <li>▶ Close the „Teachin” window by pressing the „Home” button.</li> </ul>

Key / Screen	Description / <i>Range, Units</i>
	<p><i>Start-Menu appears on display.</i></p>

1

2

3

4

5

6

7

8

9

**A**

**Bond Mode (Multi wire)**

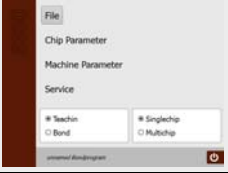
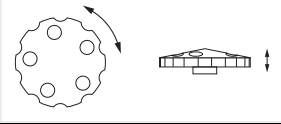
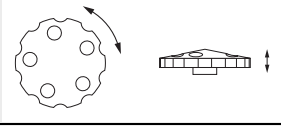


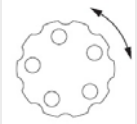

In this mode wires can be trained and bonded. Note that in this mode, all movements are performed and ultrasonic and flame-off are active so that real bonds are made.

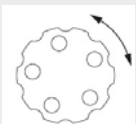
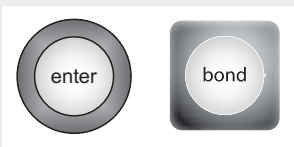
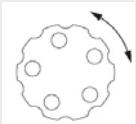
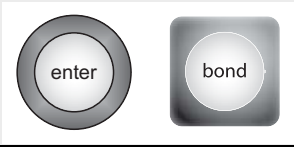
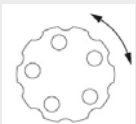
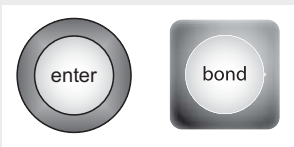
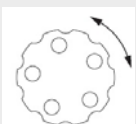
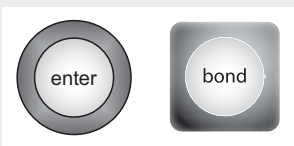
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- A**

**IMPORTANT**

If a value is changed by the shuttlewheel and not stored by the "Enter" key, the change is valid only for the currently bonded wire.

If the value is changed and confirmed by the "Enter" key, the change is also stored in the bond program and will be valid for all future bonds of this wire.

Key / Screen	Description / Range, Units
	Start-Menu appears on display.
	➤ Select and activate "Bond".
	➤ Select and activate "Multiwire".
	➤ Press "Bond-Key" to open the menu item „Bond“.
	If no Wire List was created an error message appears. ➤ By selecting "Wire Parameters" wre liist can be created.
	➤ Adjust the "Wire number".
	➤ Move the cursor to the next parameter by pressing the „Bond-Key“.

Key / Screen	Description / Range, Units
	<ul style="list-style-type: none"> <li>➤ Adjust the "Searchheight1".</li> </ul>
	<ul style="list-style-type: none"> <li>➤ To store the value press the „Enter“ button.</li> <li>➤ Move the cursor to the next parameter by pressing the „Bond-Key“.</li> </ul> <hr/> <p><b>IMPORTANT</b></p> <p><i>The bond head moves in the Z direction down until the tool touches!</i></p>
	<ul style="list-style-type: none"> <li>➤ Adjust the "Loopheight".</li> </ul>
	<ul style="list-style-type: none"> <li>➤ To store the value press the „Enter“ button.</li> <li>➤ Move the cursor to the next parameter by pressing the „Bond-Key“.</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Adjust the "Looplength".</li> </ul>
	<ul style="list-style-type: none"> <li>➤ To store the value press the „Enter“ button.</li> <li>➤ Move the cursor to the next parameter by pressing the „Bond-Key“.</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Adjust the "Searchheight2".</li> </ul>
	<ul style="list-style-type: none"> <li>➤ To store the value press the „Enter“ button.</li> <li>➤ Move the cursor to the next parameter by pressing the „Bond-Key“.</li> </ul> <hr/> <p><b>IMPORTANT</b></p> <p><i>The bond head moves in the Z direction down until the tool touches!</i></p>
	<ul style="list-style-type: none"> <li>➤ If all parameter are set, the cursor moves to „Searchheight1“ of the second bond.</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Repeat the previous steps also for other wires.</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Close the „Bond“ window by pressing the „Home“ button.</li> </ul>
	<p><i>Start-Menu appears on display.</i></p>

1

2

3

4

5

6

7

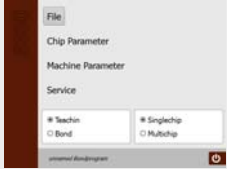
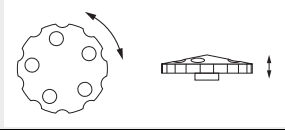

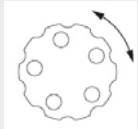

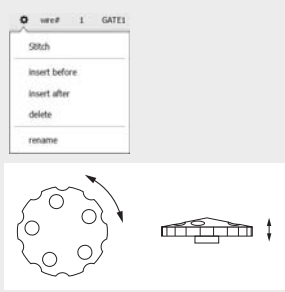
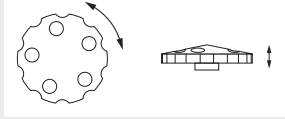
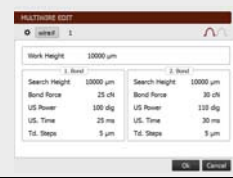
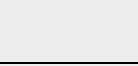
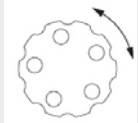
8

9

**A**

**Making Stitch bonds**

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- A**

Key / Screen	Description / Range, Units
	<p>Start-Menu appears on display.</p>
	<p>➤ Select and activate "Multiwire".</p>
	<p>➤ Press "Bond-Key" to open the menu item „Multiwire Bond“.</p>
	<p>➤ Adjust the "Wire number".</p>
	<p>➤ Move the cursor to the next parameter by pressing the „Bond-Key“.</p>
	<p>➤ Select and activate „Add Stich“ at the „ Edit“ button by using the "Shuttle-Wheel".</p>
 	<p>A „Stich“ symbol appears top right in the Multiwire-menu.</p>
	<p>➤ Move the cursor to the next parameter by pressing the „Bond-Key“.</p>
	<p>➤ Adjust the "Searchheight1".</p>

Key / Screen	Description / Range, Units
	<ul style="list-style-type: none"> <li>➤ To store the value press the „Enter” button.</li> <li>➤ Move the cursor to the next parameter by pressing the „Bond-Key”.</li> </ul> <hr style="border: 1px solid yellow;"/> <p><b>IMPORTANT</b></p> <p><i>The bond head moves in the Z direction down until the tool touches!</i></p>
	<ul style="list-style-type: none"> <li>➤ Adjust the "Loopheight".</li> </ul>
	<ul style="list-style-type: none"> <li>➤ To store the value press the „Enter” button.</li> <li>➤ Move the cursor to the next parameter by pressing the „Bond-Key”.</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Adjust the "Looplength".</li> </ul>
	<ul style="list-style-type: none"> <li>➤ To store the value press the „Enter” button.</li> <li>➤ Move the cursor to the next parameter by pressing the „Bond-Key”.</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Adjust the "Searchheight2".</li> </ul>
	<ul style="list-style-type: none"> <li>➤ To store the value press the „Enter” button.</li> <li>➤ Move the cursor to the next parameter by pressing the „Bond-Key”.</li> </ul> <hr style="border: 1px solid yellow;"/> <p><b>IMPORTANT</b></p> <p><i>The bond head moves in the Z direction down until the tool touches!</i></p>
	<ul style="list-style-type: none"> <li>➤ If all parameter of the bond are set, the cursor moves to „Searchheight1” of the next bond.</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Move the cursor to the next wire number by pressing the „Bond-Key”.</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Repeat the previous steps also for other wires.</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Close the „Multiwire” window by pressing the „Home” button.</li> </ul>

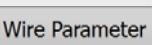
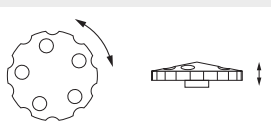
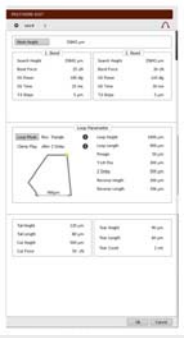
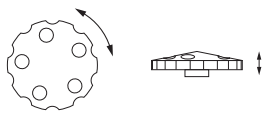
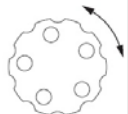
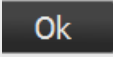
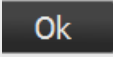
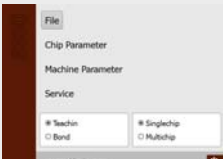
1  
2  
3  
4  
5  
6  
7  
8  
9  
**A**



**A.1.5 Select Loop Mode and define Values**


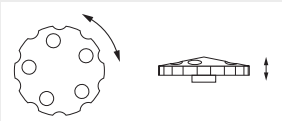

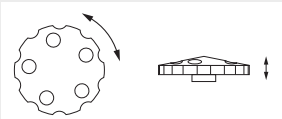
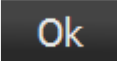
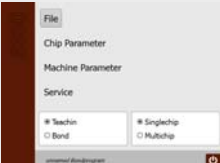
**Change Loop Mode**

1  
2  
3  
4  
5  
6  
7  
8  
9  
**A**

Key / Screen	Description / Range, Units
 	<p>➤ Select and activate "Wire Parameter".</p>
	<p>Wire Parameter-Menu appears on display.</p>
	<p>➤ Select and activate the "Loop Mode".</p>
	<p>➤ Adjust the „Loop Mode“ by using the "Shuttle-Wheel". The graphical display of the loop mode shows the new loop shape during bonding.</p>
	<p>➤ Press „Enter“ to confirm the chosen "Loop Mode".</p>
	<p>➤ Press "Ok" to store and close the Wire Parameter menu. „Cancel“ and „Escape“ close the window without saving.</p>
	<p>Start-Menu appears on display.</p>

**Define value**

After loading or creating a bond program, the default values are copied into the screen "Wire Parameter". In addition, loop height and other parameters can be seen in the setting "Loop Parameter".

Key / Screen	Description / Range, Units	
	<p>➤ Press the "Home-Key" <i>Bondhead moves to Home-position</i></p>	<p><u>1</u></p>
<p>Wire Parameter</p> 	<p>➤ Select and activate "Wire Parameter" by using the "Shuttle-Wheel".</p>	<p><u>2</u> <u>3</u></p>
	<p><i>Wire Parameter-Menu appears on display.</i></p>	<p><u>4</u> <u>5</u> <u>6</u></p>
	<p>➤ Select and activate the "Loopheight". ➤ Adjust the value and confirm.</p>	<p><u>7</u> <u>8</u></p>
	<p>➤ Repeat the previous steps also for other parameter.</p>	<p><u>9</u></p>
	<p>➤ Press "Ok" to store and close the Wire Parameter menu. <i>„Cancel" and „Escape" close the window without saving.</i></p>	<p><u>A</u></p>
	<p><i>Start-Menu appears on display.</i></p>	

Wires can be bonded with a reverse movement.

## **A.2 Your Opinion**

As a manufacturer of high-end machines, F&S Bondtec wants you to have your machine up and running as quickly as possible. We hope that this User Guide is useful and to your satisfaction in every way.

We are always glad to receive your suggestions and proposals relating to the machine, the user interface and the documentation, and we always do our utmost to evaluate and implement everything that helps improve our service to you. Consequently, we have drawn up a list with a few questions to help you express your opinions and your suggestions.

Please complete this page and send it to our Documentation department:

**Fax: +43-7722-67052-8272**

**Email: [service@fsbondtec.at](mailto:service@fsbondtec.at)**

---

**IMPORTANT**

*Copy this page before you fill in the blanks, so that you will have a blank form for your future suggestions.*

<b>Your name</b>	<b>Company</b>
<b>Phone</b>	<b>Fax</b>
<b>E-mail</b>	
<b>Was the information you needed easy to find?</b>	<b>How do you grade the user prompting in the machine and the structure of the documentation?</b>
<b>Which sections could be more detailed?</b>	<b>Do you have any suggestions for improvement?</b>
<b>Do you have any open questions? If so, what are they?</b>	<b>What features did you like?</b>

1

2

3

4

5

6

7

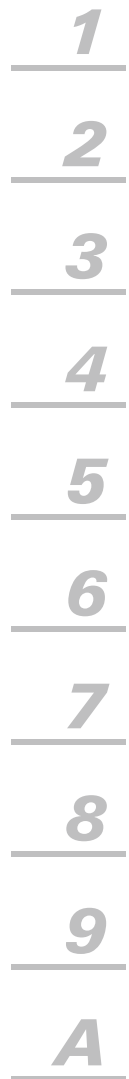
8

9

**A**

## LIST OF FIGURES

fig. 1 - 1	Nameplate . . . . .	1-2
fig. 1 - 2	Serial number . . . . .	1-2
fig. 2 - 3	Main switch with emergency stop function . . . . .	2-11
fig. 4 - 4	Description of the bonder . . . . .	4-17
fig. 4 - 5	Working axes . . . . .	4-18
fig. 4 - 6	Bondhead . . . . .	4-19
fig. 4 - 7	Transducer . . . . .	4-20
fig. 4 - 8	Touchdown sensor. . . . .	4-20
fig. 4 - 9	feed limiter unit . . . . .	4-21
fig. 4 - 10	Wire clamp . . . . .	4-21
fig. 4 - 11	Bonding tool . . . . .	4-22
fig. 4 - 12	Bondforce . . . . .	4-23
fig. 4 - 13	Substrate carrier. . . . .	4-24
fig. 6 - 14	Main switch with emergency stop function . . . . .	6-30
fig. 6 - 15	Bonding procedure - moving to the first bonding position . . . . .	6-33
fig. 6 - 16	Bonding procedure - performing the source bond . . . . .	6-33
fig. 6 - 17	Bonding procedure - moving to loopheight . . . . .	6-34
fig. 6 - 18	Bonding procedure - moving to the second bond position . . . . .	6-34
fig. 6 - 19	Bonding procedure - performing the destination bond . . . . .	6-35
fig. 6 - 20	Bonding procedure - tearing off the wire . . . . .	6-35
fig. 6 - 21	Selecting the bonder software . . . . .	6-36
fig. 6 - 22	Main Screen . . . . .	6-37
fig. 6 - 23	"File"main menu . . . . .	6-38
fig. 6 - 24	File > New Program . . . . .	6-39
fig. 6 - 25	File > New Program2. . . . .	6-39
fig. 6 - 26	File > Load. . . . .	6-40
fig. 6 - 27	File > Save / Save as . . . . .	6-40
fig. 6 - 28	File > delete multiwire . . . . .	6-40
fig. 6 - 29	Main menu - learn wire . . . . .	6-41
fig. 6 - 30	edit wires . . . . .	6-42
fig. 6 - 31	Rectangle . . . . .	6-44
fig. 6 - 32	Triangle . . . . .	6-44
fig. 6 - 33	Reverse Triangle. . . . .	6-44
fig. 6 - 34	Table Tear . . . . .	6-45
fig. 6 - 35	„Machine Parameters“ menu . . . . .	6-47
fig. 6 - 36	Edit Bondmode Configuartion . . . . .	6-47
fig. 6 - 37	"Service" main menu . . . . .	6-49
fig. 6 - 38	Service > Digital I/O´s . . . . .	6-49
fig. 6 - 39	Service > Hardware Test . . . . .	6-50
fig. 6 - 40	Get version 5310 . . . . .	6-50
fig. 6 - 41	Shutdown dialog . . . . .	6-51
fig. 6 - 42	Feeder duct in spool carrier . . . . .	6-53
fig. 6 - 43	Wire guide . . . . .	6-55
fig. 7 - 44	Error message . . . . .	7-57
fig. 8 - 45	Screw with locknut of the wire clamp . . . . .	8-60
fig. 8 - 46	Spring-loaded screw of the wire clamp . . . . .	8-61
fig. 8 - 47	clamp pressure measuring point . . . . .	8-61
fig. 8 - 48	Bondweight calibration . . . . .	8-62
fig. 8 - 49	Sensor clamp screw on the touchdown sensor . . . . .	8-63
fig. 8 - 50	Heating . . . . .	8-64
fig. 8 - 51	Temperature setting . . . . .	8-64
fig. A - 52	Stich bond . . . . .	A-86



## INDEX

### A

adjustments . . . . .	8-59
airtight envelope . . . . .	5-25
ambient conditions . . . . .	3-15

### B

background knowledge bonding . . . . .	6-31
bonder software	
<i>selecting</i> . . . . .	6-36
bondforce . . . . .	4-23
<i>calibrate</i> . . . . .	8-62
bondhead . . . . .	4-19
bonding process	
<i>preparing to bond</i> . . . . .	6-52
<i>procedure</i> . . . . .	6-33
bonding tool . . . . .	4-22
<i>cleaning</i> . . . . .	9-68
<i>replacing</i> . . . . .	9-71
bondweight . . . . .	6-31
bondweight calib . . . . .	6-49

### C

CE declaration of conformity . . . . .	2-8
changing the wire spool . . . . .	6-53
chips . . . . .	6-31
clamp pressure	
<i>adjusting</i> . . . . .	8-61
cleaning . . . . .	9-68
connecting to power supply . . . . .	5-28
copyright . . . . .	1-3
crush hazard . . . . .	2-9

### D

description . . . . .	4-17
digital I/O's . . . . .	6-49
disposal . . . . .	2-14
drive belts . . . . .	9-68
drives . . . . .	2-9

### E

error messages . . . . .	7-57
--------------------------	------

### F

file . . . . .	6-38
<i>load</i> . . . . .	6-40
<i>new</i> . . . . .	6-39
<i>save / save as.</i> . . . . .	6-40
form for fault description . . . . .	7-58

### G

get version . . . . .	6-50
guarantee, warranty . . . . .	1-3

### H

hardware . . . . .	4-18
hazardous substances . . . . .	2-9
heated substrate holder . . . . .	2-9
heating	
<i>adjusting</i> . . . . .	8-64

### I

initialisation position . . . . .	6-36
installed load . . . . .	3-15

### L

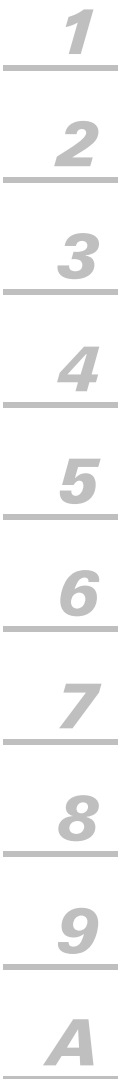
liability . . . . .	1-3
load program . . . . .	6-40
loop distance . . . . .	6-31
Loop Patameter . . . . .	6-43
loopheight . . . . .	6-31

### M

machine parameters . . . . .	6-47
main screen . . . . .	6-37
maintenance . . . . .	9-67
manufacturer's address . . . . .	1-1
manufacturer's designated use . . . . .	2-8
method of operation . . . . .	4-17
misuse for other applications. . . . .	2-8
modus bar . . . . .	6-38
movable parts . . . . .	2-9, 9-68

### N

nameplate . . . . .	1-2
new program . . . . .	6-39
noise emission . . . . .	3-15



notes on safety . . . . . 2-5, 2-11, 2-13, 6-29  
    *adjustments* . . . . . 8-59  
    *maintenance* . . . . . 9-67

**1**

**O**  
obligations undertaken by the purchaser . . . . . 2-13

**2**

operating location . . . . . 5-26  
operating temperature . . . . . 3-15

**3**

**P**  
packaging . . . . . 5-25  
personnel qualification . . . . . 2-12

**4**

positioning system . . . . . 4-18  
protective equipment . . . . . 2-10  
protective gear . . . . . 2-10

**5**

**R**  
relative humidity . . . . . 3-15

**6**

residual hazards . . . . . 2-9  
    *drives* . . . . . 2-9  
    *hazardous substances* . . . . . 2-9  
    *heated substrate holder* . . . . . 2-9  
    *movable parts* . . . . . 2-9

**7**

reverselength . . . . . 6-43

**8**

**S**  
safety . . . . . 2-5  
safety devices . . . . . 6-30

**9**

save / save as . . . . . 6-40  
scope of supply . . . . . 1-1

**A**

search height . . . . . 6-31  
service . . . . . 6-49  
    *bondweight calib* . . . . . 6-49  
    *digital I/Os* . . . . . 6-49  
    *get version* . . . . . 6-50  
shut down . . . . . 6-51  
software version . . . . . 6-36  
storage . . . . . 5-25  
storage period . . . . . 5-25  
substrate carrier . . . . . 4-24  
supply voltage . . . . . 3-15  
switching off the bonder . . . . . 6-51  
symbols . . . . . 2-5  
system of coordinates . . . . . 4-18

**T**  
tailheight . . . . . 6-32  
TD speed . . . . . 6-32

tear/cut parameter . . . . . 6-45  
technical data . . . . . 3-15  
terms . . . . . 6-31  
touchdown . . . . . 6-32  
touchdown sensor . . . . . 4-20  
    *adjusting* . . . . . 8-63  
touchdown threshold . . . . . 6-32  
transducer . . . . . 4-20  
    *replacing* . . . . . 9-69  
transportation . . . . . 5-25

**U**  
unpacking the component . . . . . 5-27  
unplugging tool . . . . . 6-32  
US power . . . . . 6-32  
User Guide . . . . . 2-5, 2-12

**V**  
Vacuum . . . . . 3-15  
voltage frequency . . . . . 3-15

**W**  
warning labels . . . . . 2-6  
wire  
    *threading* . . . . . 6-55  
wire clamp . . . . . 4-21  
    *adjusting* . . . . . 8-60  
    *cleaning* . . . . . 6-54  
    *replacing* . . . . . 9-70  
wire guide  
    *cleaning* . . . . . 6-54  
wire parameter . . . . . 6-41  
workheight . . . . . 6-31