CORNING
Discovering Beyond Imagination

# Quick Reference Guide
# X77i

## X77i Fusion Splicer

Subject to availability and technical modifications

Corning Cable Systems GmbH & Co. KG reserves the right to improve, to expand or in some other manner to modify Corning Cable Systems products without prior notice. Consequently, data and other information regarding the products may also change. No legal claim to the delivery of a specific product under precisely determined specifications comes into being until Corning Cable Systems GmbH & Co. KG accepts a binding order.

All rights reserved. This publication is not to be reproduced or duplicated without the written authorization of Corning Cable Systems GmbH & Co. KG.

Corning Cable Systems is ISO 9001 and ISO 14001 certified.

Published by Corning Cable Systems GmbH & Co. KG · Splice & Test Equipment
Wolfratshauser Str. 84 · D-81379 Munich, Germany
Ph.: +49 (0)89 5111-3163 · Fx.: +49 (0)89 5111-3420

© 2006 by Corning Cable Systems GmbH & Co. KG
Printed in Germany

Issue December 2006
Order number: 2806241-01

# 1 Introduction

## Contents Page

Contacts ..... 1-2
Important Information about the Product ..... 1-3
European Union Compliance Statement ..... 1-3
Electromagnetic Compatibility (EMC) ..... 1-4
Manufacturer's Liability for Defects ..... 1-4
Important Information about the Operating Instructions ..... 1-4
Content and Storage ..... 1-4
Safety Instructions ..... 1-4

# Contacts

If your Fusion Splicer requires service please ship to:

CCS Splice Equipment
1928 Main Ave. S.E.
Hickory, NC 28602-1401
USA

Ph: 828-901-6821

NOTE

Corning Cable System Customer Service must prepare a repair order (FX) prior to the unit being sent to the Splicer Service Center. Please contact Corning Cable Systems Customer Service at 1 800-743-2671 (toll free) or 828-901-5000 (international). An FX order number will be provided which should be written on the outside of the shipping container.

If you have technical questions or questions regarding our training program, please contact:

Corning Cable Systems LLC
P.O Box 489
Hickory, NC 28603-0489

Ph.: 1-800-743-2671 (for US and Canada) or 828-901-5000 (international)
Fx.: 828-327-5973

CAUTION

Please make a backup from all data, all new service packs and all system patches on the splicer's hard disk before you send the Fusion Splicer to the service center.

# Important Information about the Product

## European Union Compliance Statement

**EU – Konformitätserklärung**
***EU - Declaration of Conformity***
**Nr. / No. 0022 PGM**

| | |
|---|---|
| **iCDS / iLID / X77i**<br>Fabrikat / Product | I-CDSUNIT-1 / I-LIDUNIT-1 / I-X77UNIT-1<br>Mat. Nr. / Mat. No. |

des Herstellers / by manufacturer
Corning Cable Systems GmbH & Co. KG · Splice & Test Equipment
Wolfratshauser Str. 84 · D-81379 München / D-831379 Munich

stimmt mit den Vorschriften der folgenden Europäischen Richtlinie überein:
*is in compliance with the following European Council Directives:*

| | |
|---|---|
| **89/336/EWG** | Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit geändert durch RL 91/263/EWG, 92/31/EWG und 93/68/EWG des Rates |
| ***89/336/EEC*** | *Council Directive for the harmonization of the laws of the Member States relating to electromagnetic compatibility, amended by Directives 91/263/EEC, 92/31/EEC and 93/68/EEC* |
| **73/23/EWG** | Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen, geändert durch RL 93/68/EWG des Rates |
| ***73/23/EEC*** | *Council Directive for the harmonization of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits, amended by Directive 93/68/EEC* |

**Die Übereinstimmung wird nachgewiesen durch die Einhaltung folgenden Normen:**
***The compliance is verified by the adherence to the following standards:***

| | | |
|---|---|---|
| **EN 55011** | **EN 60204-1** | **EN 60825-1** |
| **EN 55022** | **EN 349** | **EN 292** |

München, den 27.12.2006 / Munich, dated 12/27/2006

**Electromagnetic Compatibility (EMC)**

Read the appropriate Section in the Operating Instructions (see enclosed CD).

**Manufacturer's Liability for Defects**

Read the appropriate Section in the Operating Instructions (see enclosed CD).

# Important Information about the Operating Instructions

**Content and Storage**

These operating instructions contain basic instructions which must be followed during the erection, operation, troubleshooting, care and maintenance as well as during the exchange of wear parts of the fusion splicer described here.
**For this reason, read these operating instructions before putting the fusion splicer into** operation and always keep the instructions at the location at which the fusion splicer is used. To get access to the full version of the operating instructions open the pdf at the enclosed CD.

**Safety Instructions**

All instructions regarding danger, warnings and caution must definitely be followed to avoid such consequences as serious injury, death and property damaged. To this end, carefully read through **Chapter »2 Operating Safety«**.

# 2 Operating Safety

## Contents

Page

Conventions for Utilized Safety Instructions ..... 2-2
Higher-Level Provisions ..... 2-3
Qualified or Adequately Trained Personnel ..... 2-3
Use as Intended ..... 2-3
User's Statutory Duty to Disclose ..... 2-3
Environmentally Compatible Disposal, Generally ..... 2-3
Disposal of Fusion Splicer ..... 2-3
Disposal of Batteries ..... 2-4
Safety Instructions ..... 2-5
Warning Label on the X77i Fusion Splicer ..... 2-12

# Conventions for Utilized Safety Instructions

These operating instructions contain instructions that you must follow for your personal safety and also to avoid material damage:

**DANGER**

In these operating instructions, as well as in warnings on the products themselves, this term means that death, serious injury or substantial property damage **will** result if the relevant precautions are not observed.

**WARNING**

In these operating instructions, as well as in warnings on the products themselves, this term means that death, serious injury or substantial property damage **may** result if the relevant precautions are not observed.

**CAUTION**

In these operating instructions, as well as in warnings on the products themselves, this term means that slight injury or property damage may result if the relevant precautions are not observed.

**NOTE**

In these operating instructions, this term makes reference to important information about the product or the relevant part of the operating instructions to which particular attention must be paid.

# Higher-Level Provisions

| | |
|---|---|
| **Qualified or Adequately Trained Personnel** | Read the appropriate Section in the Operating Instructions (see enclosed CD). |
| **Use as Intended** | Read the appropriate Section in the Operating Instructions (see enclosed CD). |
| **User's Statutory Duty to Disclose** | Read the appropriate Section in the Operating Instructions (see enclosed CD). |
| **Environmentally Compatible Disposal, Generally** | Read the appropriate Section in the Operating Instructions (see enclosed CD). |
| **Disposal of Fusion Splicer** | The Fusion Splicer is not to be disposed of in the household waste. Contact Corning Cable Systems if you wish to dispose of the fusion splicer. You will find the pertinent contact address in the Section »Contacts« on Page 1-2. |

| | |
|---|---|
| NOTE | **Do not dispose** of the Fusion Splicer or the accessories **in the household waste**. |

| | |
|---|---|
| NOTE | Goods **without an RMA** (Return Material Authorization) number or **not shipped free** of charge can not be accepted |

**Disposal of Batteries**

The rechargeable batteries and the lithium batteries must be disposed of in an environmentally compatible fashion. Return batteries to Corning or take them to an official collection depot. Contact your local authorities if necessary for detailed information concerning disposal.
Only the Service Center (see »Contacts« on Page 1-2) is permitted to exchange lithium batteries. Therefore dead lithium batteries are disposed of by the Service Center.

If disposed of improperly, the lithium batteries and the lead-gel batteries pollute the environment. The rechargeable lead-gel batteries are not to be disposed of in the household waste. As already mentioned above, only the Service Center (see »Contacts« on Page 1-2) is permitted to exchange lithium batteries.

Never place lithium batteries and lead-gel batteries in a fire. Lead-gel batteries and lithium batteries may **explode** if they come into contact with open flame.

# Safety Instructions

Comply with all of the safety instructions given below and comply with the special safety instructions in the individual Chapters.

| | |
|---|---|
| DANGER | The fusion splicer is only suitable for, and intended for splicing **glass fibers for telecommunications. Insertion of other materials**, metal for example, results in destruction of the device and its individual components, and **endangers human life**. The latter may come about as the result of a potential, deadly electric shock and extremely severe burns to the skin (see »Warning Label on the X77i Fusion Splicer« on Page 2-12). Insertion of other materials falls under “Not use as intended” (see Page 2-3). |

| | |
|---|---|
| DANGER | **Comply with all safety regulations of your country that apply when working with glass fibers.** For example, always wear suitable goggles, never eat and drink while working. Close food and beverage containers and store them some distance away. Immediately place any piece of glass fiber in the closable container. An appropriate warning label on the closable container must indicate this. **Glass fibers** that make their way into the body **can be lethal**.<br>As a basic rule, pieces of **glass fibers are not to be allowed to reach the environment** because they will scarcely ever be found and can therefore still cause injuries later. |

| | |
|---|---|
| DANGER | When electrical equipment is operated, certain **parts** (fusion generator, piezos, electrodes, etc.) **of such equipment or the electrical accessories are bound to reach hazardous voltage levels**. If the appropriate warnings are not observed, serious injury or property damage may occur. |

| | |
|---|---|
| DANGER | It is only permissible to operate the fusion splicer if it is used as intended (see Page 2-3). If **not used as intended the result is risk of death**, serious physical injury and / or major material damage. |

| | |
|---|---|
| DANGER | All activities are to be carried out by appropriately qualified (and, where necessary, additionally trained) personnel. This means that the personnel must be familiar with **all safety instructions** in these operating instructions as well as with the maintenance and operation of the fusion splicer. Above and beyond this, the personnel must be familiar with the special precautions that apply when working with glass fibers. |

| | |
|---|---|
| DANGER | For safe handling of the accessories, including storage batteries and RapidoShrink fast heat-shrink oven, the safety instructions in these operating instructions and in the operating instructions of the pertinent accessories which are included in the scope of delivery of the accessories must be followed. |

| | |
|---|---|
| DANGER | The contacts of the storage batteries are never to be short-circuited. Never bring electrically conductive material (e.g., metal or liquids) in the vicinity of the contacts.<br>The storage batteries are never to be stored in the vicinity of sources of heat (e.g., radiators, ovens or an open flame). **They may explode**. |

| | |
|---|---|
| DANGER | The fusion splicer is not to be operated if the warning label on it (see »Warning Label on the X77i Fusion Splicer« on Page 2-12) or on the accessories, e.g., on the RapidoShrink fast heat-shrink oven are illegible, damaged or missing.<br>In these instances the warning label must be exchanged or applied again immediately. |

| | |
|---|---|
| DANGER | Furthermore, the fusion splicer is not to be operated if it is damaged or if the safety devices have been manipulated. A manipulation exists, for example, if a fastened or movable cover is removed or the safety circuit for shutting down the electrode voltage is bridged (see »Warning Label on the X77i Fusion Splicer« on Page 2-12). |

| | |
|---|---|
| DANGER | Never perform cleaning jobs with alcohol in the vicinity of an open flame or other heat sources (e.g., hot lamps). Just dampen the paper towels sparingly with isopropyl alcohol so that none of this gets into the fusion splicer. Dispose of the used towels separately so that no alcohol residues or vapors can be ignited. After cleaning jobs, always make certain that all alcohol residues on the splicer are completely dried before you switch the fusion splicer back ON. Failure to do so may result in an explosion! |

| | |
|---|---|
| DANGER | If water or some other liquid gets into the fusion splicer, switch the splicer OFF and disconnect it from the power supply. Remove the flat batteries. Continuing to operate the fusion splicer under these conditions would risk fire and danger of a lethal electrical shock. Mark the fusion splicer „Faulty” to prevent it from being switched back ON. |

| | |
|---|---|
| DANGER | No automatic electrode cleaning or splicing process is permitted, **if there is moisture (condensation) in the vicinity of the electrodes**. In such a situation, you are **only allowed to switch the Fusion Splicer ON with the electrode flap open.** This prevents any activated automatic electrode cleaning (the ignition of the cleaning arc).<br>Make certain that all the flaps remain open until the Fusion Splicer is dry. Switching the Fusion Splicer ON accelerates the drying process. This procedure applies only in case of moisture (condensation), if there is some water or some other liquid inside the fusion splicer, it is a fundamental rule that the fusion splicer is not to be switched ON. |

| | |
|---|---|
| DANGER | If the fusion splicer has been dropped and is thereby damaged or is damaged due to another cause, switch it OFF immediately and disconnect it from the power supply. Remove the flat batteries. Mark the fusion splicer “Faulty“ to prevent it from being switched back on. Notify the Service Center (see Chapter »1 Introduction«). |

| | |
|---|---|
| DANGER | **Never switch the Fusion Splicer ON if both electrodes are not - or not correctly - inserted**. This would damage the splicer and could result in death or serious bodily injury. Never touch the integrated electrodes. |

| | |
|---|---|
| WARNING | Never switch the fusion splicer OFF if there are still fibers in it. |

| | |
|---|---|
| WARNING | First always switch the fusion splicer OFF by the keys of the control panel (see »Splicer ON / OFF« on Page 3-5) before isolating it from the power supply (inserted lead-gel battery or AC Power). If you do not do so the positioning slides will not travel to the transport position.<br>It is not permissible to transport the fusion splicer in such a situation. This also applies in the event of a power failure in the supply network while the splicer is in operation and if there isn't a lead-gel battery inserted in the fusion splicer. |

| | |
|---|---|
| WARNING | During AC or battery operation, if you do not actuate a key within a specified period of time, the fusion splicer switches the monitor OFF. During battery or AC power mode, after an additional period of time the positioning slides move in toward the transport position and the fusion splicer switches itself OFF. It is imperative that any inserted finished splice or inserted fibers are removed beforehand, before the positioning slides start to move. Otherwise the splice or the fibers will brake and may cause injury. |

| | |
|---|---|
| WARNING | Never insert a piece of metal or another material into the bore holes in the body of the housing. This could result in death or serious bodily injury. |

| | |
|---|---|
| WARNING | If the fusion splicer makes unusual noises, remove the fibers immediately. After that, please switch the fusion splicer OFF immediately (operating panel) and disconnect it from the power supply. Remove the flat batteries. Mark the splicer "Faulty" to prevent it from being switched back ON. Notify the Service Center (see Chapter »1 Introduction«).<br>It is normal for the fans to switch ON after the fusion splicer has been operating for a certain length of time. |

| | |
|---|---|
| WARNING | The fusion splicer contains lithium batteries. When the lithium batteries are dead (“empty”), the fusion splicer must be sent to the Service Center, i.e., the manufacturer handles disposal of the lithium batteries. If the entire fusion splicer has to be disposed of (including the lithium batteries), you should also contact Corning Cable Systems (see »Contacts« on Page 1-2). |

| | |
|---|---|
| WARNING | Use the fusion splicer only on dry surfaces only and always store it in a dry carrying case. |

| | |
|---|---|
| WARNING | No changes whatsoever are to be made on the fusion splicer, the power supply unit or the accessories (cable, plugs or sockets). |

| | |
|---|---|
| WARNING | Never use spray cans to clean optical lenses or the area of the electrodes because this can cause dirt to reach other areas of the fusion splicer or glass fiber residues to be swirled up in the air and breathed in. Never use compressed air for cleaning either. |

| | |
|---|---|
| WARNING | If the tilt base of the fusion splicer is used, it must always be folded all the way back and the fusion splicer must be securely placed on a flat, horizontal surface. If the base folds in accidentally, there is the risk of a shearing injury to finger or hand. |

| | |
|---|---|
| CAUTION | Do not use the fusion splicer in the vicinity of high voltage lines or high frequency fields. |

| | |
|---|---|
| CAUTION | The lead-gel batteries can only be charged properly if they are inserted in the fusion splicer. This eliminates the possibility of overcharging. |

| | |
|---|---|
| CAUTION | Never attempt to clean the P&D electrodes mechanically. No glass fibers are to be inserted in the fusion splicer while the electrodes are being cleaned electrically. |

| | |
|---|---|
| CAUTION | The rubber feet of the fusion splicer can leave impressions on some surfaces. This can be removed readily with soapy water or, if suitable, with furniture polish. |

| | |
|---|---|
| CAUTION | Improper and incomplete maintenance may affect the operating characteristics of your fusion splicer. All liabilities borne by the manufacturer are null and void if the fusion splicer is tampered with by unauthorized persons. |

# Warning Label on the X77i Fusion Splicer

A self-adhesive, metallic warning label is used. The configuration of the warning sign is in accordance with ISO 3864-2, VBG125 W08 and ANSI Z535.4

→ Always make sure that the warning label is on the fusion splicer (see illustration below) and that it is legible, is adhering well and is not damaged.

→ Exchange a damaged or missing warning label without delay.

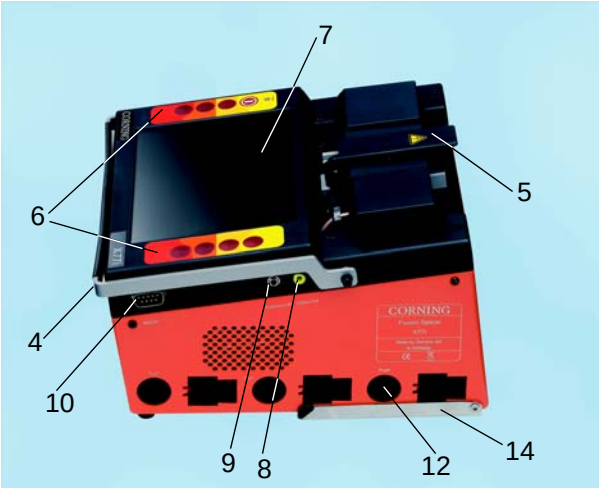
**DANGER: HAZARDOUS VOLTAGE!**
There is a lethal level of electric voltage on the electrodes during the splicing process.
**The fusion splicer is never to be operated** when its interior is damp, it is not completely assembled and / or it is damaged or the safety circuit has been manipulated (to switch OFF the voltage). Touching the electrodes while voltage is applied will cause death due to electric shock and to very serious burns. Looking at the electric arc will cause eye damage.
**No materials other than glass fibers for telecommunications** are ever to be inserted into the fusion splicer. The fibers are to be correctly prepared. For example, if electrically conductive material is inserted and it is touched, the result will be **death** due to electric shock and serious burns. In the case of other materials (plastic, etc.), there is a risk of fire and danger of poisonous fumes.
**NAFTA Region: HAZARDOUS VOLTAGE**
**RISK OF ELECTRICAL SHOCK OR BURN**

# 3 Overview of the Equipment

Contents Page

Overview of X77i Fusion Splicer ..... 3-2
Lead-gel and Lithium Batteries ..... 3-3
Screen ..... 3-4
Splicer ON / OFF ..... 3-5
Touchscreen: Symbols (Softkeys) ..... 3-6
Technical Data for X77i Fusion Splicer ..... 3-7

# Overview of X77i Fusion Splicer



| | |
|---|---|
| 1 | 12V DC input socket for connecting the 12V DC 100W external desktop power supply unit or the connection cable to the vehicle wiring system |
| 2, 3 | 12VDC output socket Mini DIN (e.g., for connecting the RapidoShrink heat-shrink oven) |
| 4 | Handle |
| 5 | Splicing unit with LID-System™ |
| 6 | Control panel |
| 7 | 6.4 inch color touchscreen |

**Outputs for additional functions**:

| | |
|---|---|
| 8 | Connection socket for video: 75Ω PAL / NTSC |
| 9 | Connection socket for optional pigtail adapter |
| 10 | Serial interface RS232 (only for service functions |
| 11 | USB socket: Only to connect the optional USB work lamp (no USB functionality) |
| 12 | Openings to push out the rechargeable batteries |
| 13 | Insertion slots with inserted rechargbl. batteries |
| 14 | Tilt base: Fold it out completely to the back. |

| | |
|---|---|
| **Lead-gel and Lithium Batteries** | **Proceed as follows to insert the lead-gel batteries:** |
| CAUTION | The rechargeable lead-gel batteries are protected against polarity reversal as they can only engage in the contacts in the fusion splicer when they are in the correct rotational position. Forcing the lead-gel battery into the slot in the wrong rotational position can damage the contacts in the fusion splicer. The force exerted during insertion can vary with different types of fusion splicers.<br>This information is important for you if you work with different types of fusion splicers. Always proceed carefully to determine the typical insertion force needed for the type of fusion splicer to develop a feel for the amount of force necessary and to preclude damage due its being in the incorrect rotational position. To be on the safe side, first look in the lead-gel battery slot to see where the contacts are. |

→ Fold the tilt base of the fusion splicer completely to the back.

→ Turn the original rechargeable lead-gel battery such that the contacts are in the correct rotational position and are pointing towards the fusion splicer.

→ Applying the suitable force, push the lead-gel battery from the left side of the housing into the opening until it audibly engages.

→ If the lead-gel battery does not engage, pull it back out and turn it to the correct position.

→ If the lead-gel battery is engaged completely, remove it by inserting your thumb into the round opening on the right-hand side of the housing and pushing it to the outside.

**Screen**

You can control the fusion splicer application from the user interface by simply touching the symbol displayed on the **6.4” touchscreen color monitor**, or - as customary - with the hard keys on the left and right of the screen (function allocation, see Page 3-6). The touch-screen function is also available for the XP® user interface.

Operating the Touchscreen

For operation (touching the monitor), give preference to utilization of the stylus included in the shipment (Touchscreen Stylus Pen, like that in Fig. below), which is included in the tool kit for the fusion splicer and is to be stored there. This way, you avoid getting the glass surface of the monitor dirty or damaging it. If the stylus is not available, please be careful to touch the screen only with clean, grease-free fingers.

**Splicer ON / OFF**

Press this hard key on the control panel to switch the splicer, including the integrated PC, ON or OFF.

Activation Process

→ Make certain that the fusion splicer is set up properly and is connected to the 12V DC power supply (see full version of the manual “Operating Instructions“, Chapter 4, in Section “Putting the Fusion Splicer in Operation“).

→ Briefly press the hard key. The green pilot LED (Power) at the top lights up when the 12V DC operating power is present and the activation process begins.

→ The splicer sounds a brief signal and the Windows XP® operating system is loaded (duration: approx. 45 seconds).

→ Thereafter, the fusion splicer application is started automatically and the main menu of the fusion splicer application appears on the touchscreen (see »Touchscreen: Symbols (Softkeys)« on Page 3-6).

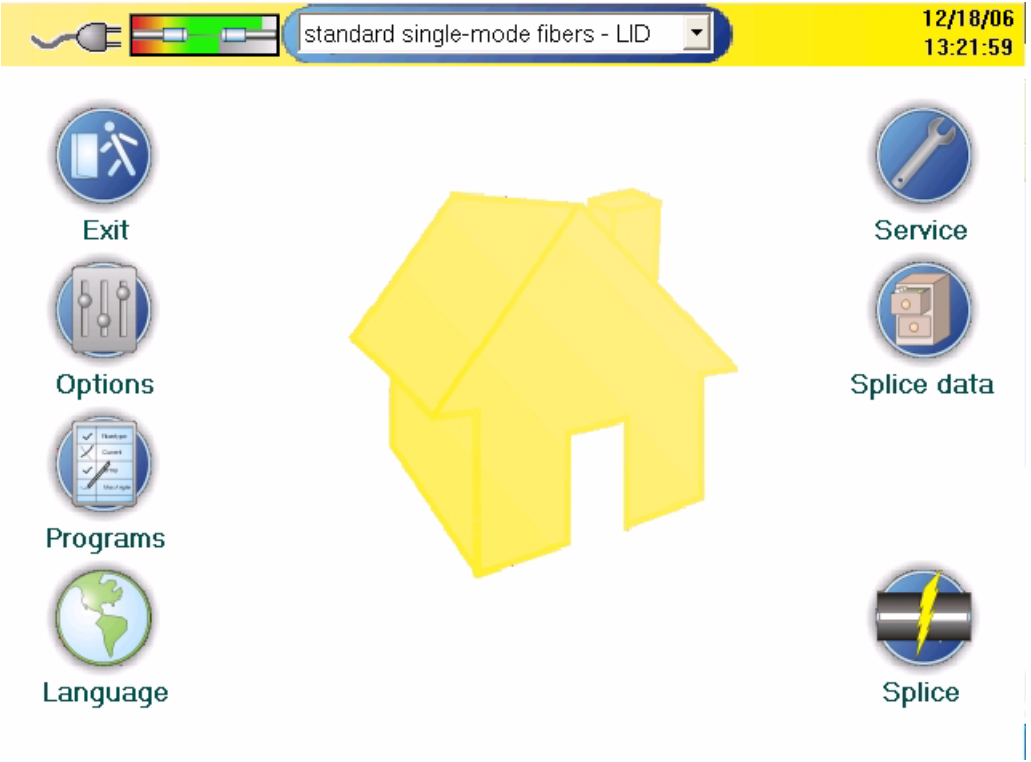
Standard Switch-OFF Procedures

The fusion splicer can be switched OFF in the following ways, to be attempted in the indicated order:

- Switch OFF by pressing the hard key for approx. **3 seconds**. During this process the fusion splicer application is closed and the operating system automatically shut down.
- Switch OFF by touching the key and then **manually** shutting down the operating system via “Start –› Turn off computer –› Turn off“.

**Touchscreen: Symbols (Soft-keys)**

The symbols (softkeys) on the left and right of the touchscreen are allocated the functions described in the full version of the manual at the enclosed CD.



# Technical Data for X77i Fusion Splicer

| | |
|---|---|
| Integrated PC: | • 1GHz processor<br>• 256MB RAM<br>• 20GB hard disk<br>• Fast Ethernet functionality<br>• Integrated loudspeaker<br>• Windows XP® Professional operating system (open) |
| Procedure for Splice Process Control: | LID-System™, CDS-System™ and L-PAS™ Video evaluation |
| Fiber preconditions: | Glass diameter 125µm with coating diameter 250µm to 900µm<br>(pigtail adapter is possible) |
| Monitor: | 6.4” color touchscreen (diagonal image 163mm)<br>VGA resolution |
| Magnification (View of the Fiber): | approx. 140-x |
| Fiber Alignment: | Approximate alignment in z-direction with stepping motors, 3-axis precision alignment with piezo-ceramic actuators |

| | |
|---|---|
| Typical Splice Loss (with Same Fibers): | • Multi-mode fibers: <0.010dB<br>• Standard single-mode fibers: <0.020dB<br>• Dispersion-shifted fibers: <0.040dB<br>• NZDS fibers: <0.030dB |
| Accuracy of the Splice Loss Evaluation: | • Typical deviation in the LID splice process: <0.02dB |
| Accuracy of the Splice Loss Evaluation: | • Typical deviation in the CDS splice process: <0.03dB |
| Tensile Test: | Standard 1.5N, piezo controlled adjustable from 0.1N to 4.5N |
| Number of splice programs: | • Fixed programs for various common fiber types<br>• 1 curve splice program<br>• 2 attenuation splice programs<br>• User-defined programs (number ultimately limited only by storage space on the hard disk). |
| Internal data memory: | For more than 100,000 splice values (limited only by capacity of hard disk) |

| | |
|---|---|
| Wave length<br>LID™ signal: | 1,310nm (laser LED, laser class 1) |
| Operating temperature (environment): | -10°C to 50°C |
| Storage temperature: | -40°C to 80°C |
| Relative humidity: | up to 93% |
| Dimensions, basic unit (L x W x H): | 200mm x 220mm x 140mm |
| Weight with and without batteries: | • without batteries 3.1kg<br>• with 3 batteries 5.1kg |

| | |
|---|---|
| Interfaces: | Right side of fusion splicer:<br>• Video: Output (75Ω), PAL / NTSC (phone plug)<br>Serial: RS232 (for servicing, not for PC or printer)<br>• External LID™ (phone plug for connecting the pigtail adapter)<br>Back of housing<br>• USB connection for work lamp<br>Front of fusion splicer:<br>• Headphone (phone socket)<br>• Microphone (phone plug)<br>• Fast Ethernet, LAN (RJ-45 socket) 10Mbit/s to 100Mbit/s<br>• USB equipment (USB1.1 / USB2.0)<br>• Video output units with VGA input (VGA socket, 15-pin, analog) |

| | |
|---|---|
| Power supply: | • **External 12V DC 100W Desktop power supply unit** with automatic voltage range detection, for AC voltage<br>90V AC to 264V AC / 47Hz to 63Hz.<br>• **DC input on the fusion splicer** for 12V +/-10% (e.g., also for vehicle wiring system)<br>• **Internal 3 x 12V 2.3Ah lead-gel batteries** individually exchange-able, approx. 3h operating time without and approx. 2.5h with the RapidoShrink fast heat-shrink oven |