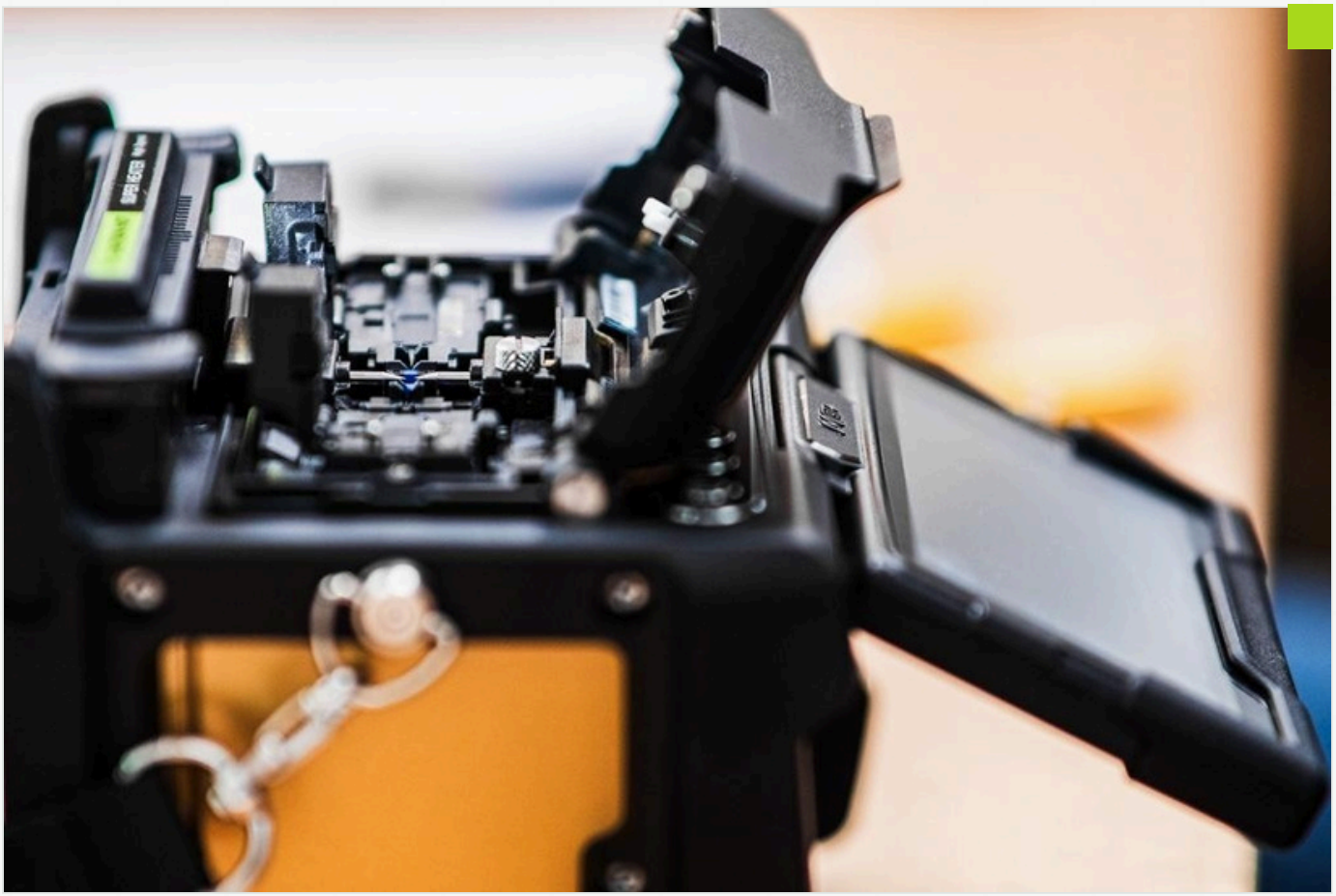
Uptero GROUP

Autumn and winter care.

INNO FUSION SPLICERS / CLEAVERS / STRIPPERS



FOR UK FIBRE ENGINEERS
AND TELECOM TECHNICIANS
PRACTICAL / FIELD TESTED

Contents.

TEN SECTIONS / ONE WORKING DAY

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SOMETHING NOT RIGHT?
If you run into a problem this guide doesn't cover, get in touch and one of our engineers will talk it through with you. Contact details are on the last page.

Introduction.

00

A FEW CHECKS BEFORE WORK SAVE A LOT OF REPEAT WORK

Autumn and winter change the conditions your equipment works in. Rain, wet clothing and muddy sites are the obvious ones. The less obvious one is every change of temperature and humidity through the day. A cold van, a heated cab, a street cabinet and a damp afternoon are all different environments for a splicer.

A splicer can arrive on site dry and still mist up once it meets warmer, damper air. A dirty cleaver causes problems that look like a splicer fault. A change of conditions shifts the arc, so a machine that splices well at eight may need recalibrating by lunchtime. This guide covers the habits that prevent those problems on INNO Instrument splicers, cleavers and strippers.

The working day

01	02	03	04	05	06
Dry storage	Secure transport	Acclimatisation	Arc calibration	Sheltered work	Dry packing

03 / ACCLIMATISATION
Letting the splicer reach roughly the temperature of the place it's going to work in before you switch it on. A few minutes is often enough. Section 02 explains why it matters and how to check.



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Moisture risks.

01

RAIN / CONDENSATION / TRAPPED DAMP

01 / RAIN AND WATER INGRESS

Rain, drips and splashes reach the splicing chamber, connectors and battery contacts. An open windproof cover (the lid over the splicing chamber) or an uncovered port leaves sensitive parts exposed, however robust the casing.

02 / CONDENSATION

Water forms on any surface colder than the dew point of the air around it. It settles as droplets or a fine film, often on parts you can't easily see.

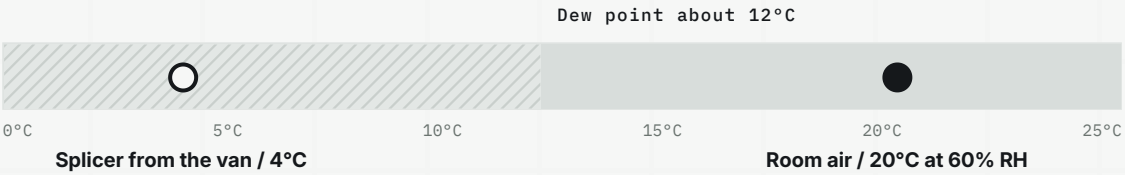
Rain doesn't have to fall on the machine for it to get wet.

03 / TRAPPED DAMP

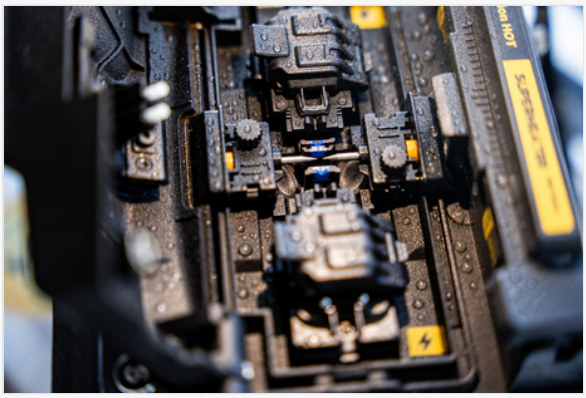
A closed case protects kit in transit but won't dry it. Damp inserts, wet tools or moisture picked up during a shift stay inside once the lid is shut. Check the case before you repack it.

How condensation works

Warm air holds more water vapour than cold air. When warm air touches a colder surface it cools, and once it drops below its dew point the surplus vapour turns to water on that surface. Room air at 20°C and 60% relative humidity has a dew point of about 12°C. A splicer that spent the night in a van at 4°C is well below that, so moisture forms on it as soon as warm air reaches it.



The shaded zone is where surfaces collect moisture. Taking a warm splicer out into the cold doesn't cause condensation on it.



Why it matters

- **Lenses.** Moisture blurs the fibre image, giving alignment errors and unreliable loss estimates.
- **V-grooves and press arms.** A film of moisture or dirt changes how the fibre sits.
- **Connections.** Water near battery and power contacts can cause electrical faults.

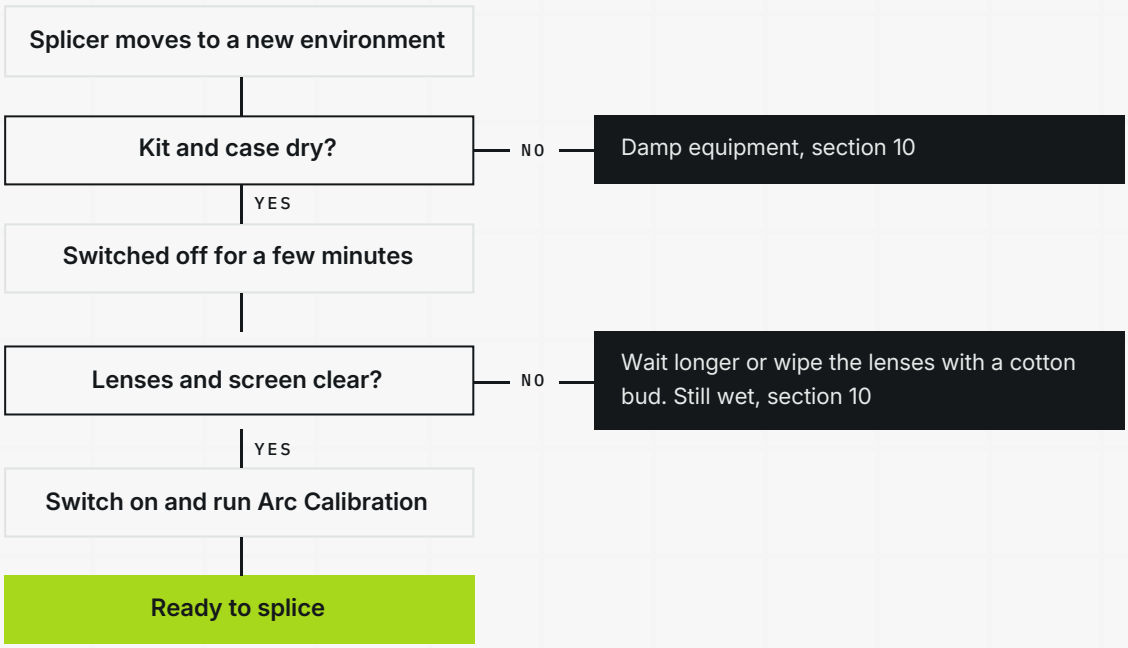
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Temperature changes. 02

LET THE SPLICER MATCH THE PLACE IT WILL WORK IN

Every change of temperature or humidity affects a splicer in two ways. Condensation comes only from moving cold equipment into warmer, damper air. The arc is affected by any change, warmer or colder, drier or damper. That's covered in section 05.

There's no fixed number of minutes to wait. In practice a few minutes in the new environment is often enough for the splicer to stop misting and work normally. A bigger jump, such as a frosty van to a heated room, takes longer. Keep the machine switched off until it's ready.





KEEPING THE CASE CLOSED

If the kit is dry, leave the case shut for the first few minutes. That keeps warm, damp air off the cold optics while the machine warms.

A heated van, a street cabinet and a building are three different environments. Each move means a fresh check.

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Overnight storage.

03

SECURITY / DAMP / THE MORNING WARM-UP

A UK winter night rarely gets near a splicer's storage limit. INNO splicers are rated for storage down to −20°C. The problems come from everything else that happens in a van overnight.

BEFORE LEAVING KIT IN THE VAN

- Security of the van and the case
- Dryness of the load area, including around the case
- Wet clothing, cables and tools nearby
- The move into a warmer environment next morning

The better option

Take the splicer, cleaver and batteries indoors overnight and keep them in the closed case in a dry room. That removes the theft risk, and the kit starts the day already at room temperature.

If the kit has to stay in the van

01 / SECURE AND CLOSED

Case closed, latched and secured so it can't slide or tip over.

02 / AWAY FROM THE WET

Away from wet clothing and wet floors. Lifting the case off the floor keeps it out of standing water.

03 / MORNING CHECK

Case opened and lenses checked before anything is switched on. Section 02 covers the warm-up.

04 / CHARGING INDOORS

Lithium-ion packs mustn't be charged below 0°C. Charge them indoors, not in a cold van overnight.

GOOD TO KNOW

OwnerMark™ by Uptero

Most of the splicer thefts we hear about in the UK are from vans. OwnerMark™ is our register of fusion splicers and other telecoms equipment, checked by serial number. If your machine is stolen, tell us and its record shows as stolen to anyone checking a machine they've been offered or seen for sale. Every machine that comes into our service centre is checked against it too.

uptero.co.uk/ownermark

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Working area.

04

DRY, CLEAN AND SHELTERED

Set up on a stable surface under a shelter that actually keeps the rain off, away from dust. Look beyond the bench at what could drip, splash or blow in to the splicer.



ON THE BENCH

- **Splicing chamber** kept away from rain, spray and dust
- **Gloves and sleeves**, wet or dusty, kept off the V- grooves and press arms
- **Cleaning materials** kept clean and dry
- **Case lid** closed whenever you're not taking tools out

WATCH OUT FOR BRICK DUST

Brick and masonry dust is one of the hardest contaminants to get out of a splicer, even on our service bench. Mixed with moisture it turns into a fine mud that works its way into the V-grooves, press arms and optics. Set up upwind and away from any drilling or cutting, and keep the windproof cover closed between splices.

Rugged isn't rainproof

The splicer and its carrying case are built for site work. Closed and latched, the case keeps out a light shower. It won't keep out heavy rain, standing water or long spells in damp air. An open splicing chamber has very little protection at all.

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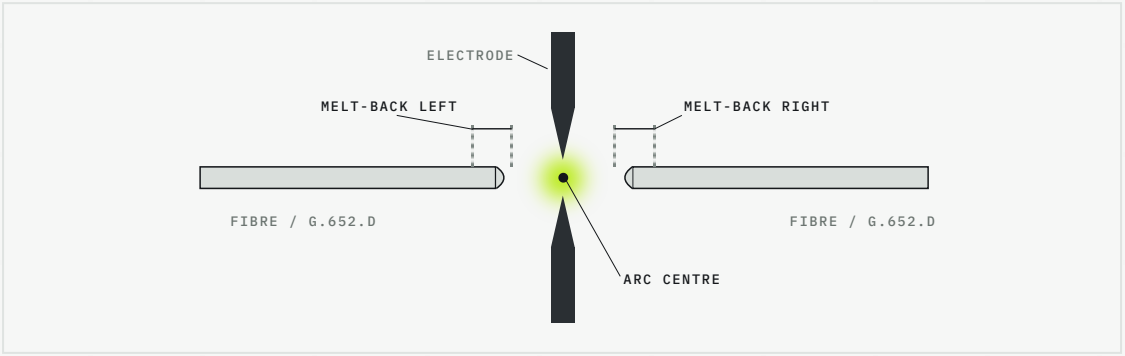
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Arc Calibration.

05

RUN IT WHENEVER THE WORKING ENVIRONMENT CHANGES

The power and shape of the arc depend on air temperature, humidity and pressure, and on the condition of the electrodes. Arc Calibration measures how far each fibre end melts back and where the arc centre sits, then corrects the arc for the conditions.



WHEN TO RUN IT

- At the start of every working day
- Whenever the working environment changes, warmer or colder, drier or damper
- After replacing the electrodes
- When splice loss becomes high or inconsistent

Calibration fibre



G.652.D

Standard single-mode G.652.D fibre, with a clean strip, a clean wipe and a fresh cleave. Never calibrate with multimode or any other fibre type.

On the splicer



01
Open the menu and select Maintenance Menu.



02
Select Arc Calibration.



03
Load two freshly prepared fibres and press SET.



04
Read the two values on screen.

11 11

READING THE RESULT

Both values should be 11, and anything from 9 to 12 is acceptable. The splicer then shows Operation Complete. If not, prepare fresh fibre and run it again until it does.

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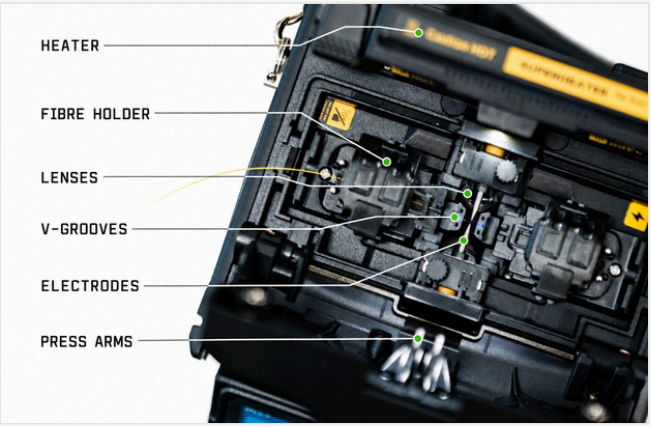
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Splicer cleaning.

06

SMALL AMOUNTS OF DIRT CAUSE REPEATED PROBLEMS

The V-grooves and the press arms with their ceramic fibre tips hold the fibre in position. Dirt on either moves the fibre off line and shows up as alignment errors and high loss.



WHAT YOU NEED

Cotton buds
Thin, clean, used once

Lint-free tissue
For wiping and drying

Cleaning fluid
IPA 99% or higher, or a fibre cleaning liquid

V-grooves	Cotton bud moistened with alcohol along the groove, then a dry bud to remove any residue.
Press arms	Ceramic tips wiped the same way. Each arm should spring back cleanly when lifted and released.
Fibre holders	Clamp pads wiped with an alcohol bud, then dried.
Lenses	Lightly moistened bud, then a dry one. Run Dust Check afterwards.
Electrodes	Keep the bud clear of the electrode tips while you work around them.
Heater	Make sure it's cool, then clean any residue off the heater plate with a cotton bud and alcohol.
Afterwards	Run Arc Calibration before the next splice.

ONE CLEANER DOESN'T SUIT EVERY SURFACE

Alcohol is right for the fibre path, lenses and heater. The screen and housing need a dry or barely damp cloth. Never canned air or gas spray, which can be flammable near the arc.

CLEANING ALCOHOL IN WINTER

Isopropyl alcohol of 99% or higher with no additives. Keep it tightly capped, as it absorbs moisture and loses strength. Never warm it on a heater or radiator.

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Cleaver and stripper care.

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GOOD PREPARATION STARTS BEFORE THE FIBRE REACHES THE SPLICER

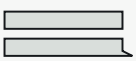
A dirty cleaver gives poor cleave angles and dirty end faces, which look like a splicer fault. Most cleave problems are cleaned away rather than fixed with a new blade position.

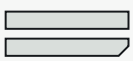


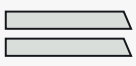
Blade	Wiped with a cotton bud moistened with alcohol. Fingers kept off the edge.
Clamp pads	Alcohol bud, then dry. Dirty pads don't hold the fibre firmly, and a firm hold is what gives a clean cleave.
Anvil	Alcohol bud to remove glass dust. It should spring back smoothly.
Offcut collector	Emptied into a sealed container for glass waste, never loose into a bin bag. Eye protection on.

What a dirty or worn cleaver does to the fibre


DUST ON FIBRE


LIP


CHIP


LARGE CLEAVE ANGLE

The splicer shows these on screen before it splices. Re-cleave and, if they keep appearing, clean the cleaver first.

BLADE POSITION AND HEIGHT
Rotate the blade or raise its height as described in the cleaver's manual, and only once cleaning hasn't cured repeated cleave angle errors.

CLEAVER MANUAL
Scan for INNO manuals and guides at uptero.co.uk

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CLEAVER AND STRIPPER CARE, CONTINUED

07

Thermal strippers

Keep the blade and the heating plate clean. Clean the plate once it has cooled and wipe the clamp pads with alcohol. Choose the heat setting for the coating and wait for the stripper to reach temperature before stripping.





Tri-hole stripper

Large hole	1.6 to 3.0mm jacket
Middle hole	600 to 900µm buffer down to 250µm
Small hole	250µm coating down to 125µm glass

Keep all three holes clean. Coating residue in the small hole nicks the glass.

Strip, clean, cleave

STRIP ◆ CLEAN ◆ CLEAVE ◆ **INTO THE SPLICER**

Load the fibre into the splicer straight after cleaving, so the end face can't pick up dirt or touch anything.

CLEANING MATERIALS TRAVEL SEALED

Alcohol goes in a tightly sealed, leakproof bottle. A pump dispenser that's handy on the bench can leak in a moving case. Fresh wipes and cotton buds stay in a sealed bag.



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Electrodes and arc count.

08

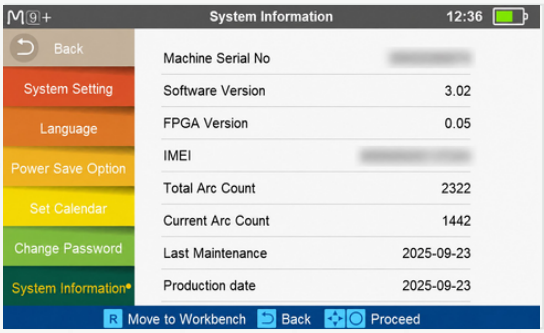
ELECTRODES WEAR WITH EVERY ARC

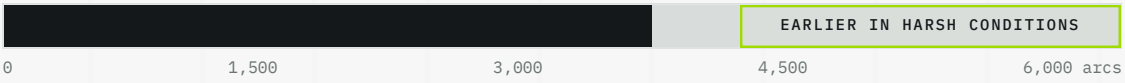
Worn electrodes give an unstable arc, higher splice loss and weaker splices. The arc count tells you when to plan a replacement, and the condition of the electrodes tells you if it's needed sooner.

WHERE TO FIND IT

On INNO splicers the arc counts are in System Information.

Current	Arcs since the last electrode change. Resets when you run Replace Electrodes in the Maintenance Menu.
Total	Arcs over the machine's whole life. Can't be reset.





Recommended replacement at about 6,000 arcs on current INNO splicers (5,500 on earlier models).

AFTER EVERY ELECTRODE CHANGE

01
Replace Electrodes
Maintenance Menu, resets the count

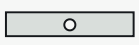
02
Stabilise Electrodes
Settles the new pair

03
Arc Calibration
Sets the arc for the new pair

Skip steps 02 and 03 and new electrodes can still give poor splices. Always replace them as a pair.

Signs of worn electrodes or a poor arc

High or inconsistent loss, a fluttering arc, a sizzling noise while arcing, and splices like these.


BUBBLE


SEPARATION


TOO THIN


TOO FAT

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Carrying case care.

09

CLEAN, CLOSED AND FREE OF GLASS

The case only protects the splicer if what's inside it is clean. Vacuum it out regularly with the equipment removed, and get rid of fibre off cuts, cable fragments, glass, mud and grit.

A CLEAN CASE

- Splicer and tools out before cleaning
- Offcuts, cable fragments and glass removed
- Latches, hinges and handle working
- Every compartment and pouch closed
- No other work over the open case

Drilling, cutting and sanding nearby fill an open case with dust that ends up on the lenses.



Sending it by courier



CASE INSIDE A BOX

A carrying case isn't a shipping box. Put the closed, latched case inside a sturdy cardboard box with padding all round, so it can't move or take a knock in transit.

Inside the case, the splicer sits in its own foam cut-out with accessories bagged separately.

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Damp equipment.

10

DAMP IS A DRYING JOB / WATER INSIDE IS A SERVICE JOB

Condensation usually clears on its own once the splicer has had time to dry. If water got inside, or you're not sure whether it did, send it to us for a check.

01 / CONDENSATION OR SURFACE DAMP

- Outside and lid wiped dry with a soft cloth
- Condensation on the lenses lifted with a clean cotton bud
- Switched off, battery out, not charging
- Out of the case at room temperature to dry inside

Keep it away from radiators and direct heat. Once the lenses and screen are clear, switch on and run Dust Check and Arc Calibration. If anything doesn't behave as normal, send it to us.

02 / WATER GOT INSIDE

If the splicer was rained into, splashed or dropped in water, don't switch it on. Take the battery out and send it to us. A short note helps us. How it got wet, whether it was switched on at the time and anything unusual since.



KEY POINT **Give it time. Heaters, hairdryers and rice don't speed drying up and can do more harm than good.**

Support beyond the sale.

UK

UK SERVICE CENTRE / REPAIR / CALIBRATION

If your splicer has persistent faults, is due a service or has been exposed to moisture, get in touch and we'll talk through what it needs. It helps to have the serial number and any error messages to hand.

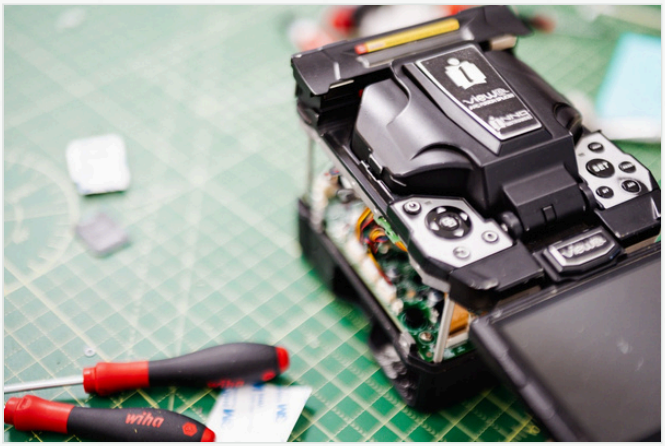
You don't need to wait for a fault to call. If something on site doesn't look right, an engineer will talk it through with you, whoever looks after the kit in your company.

UK service centre
Servicing and repairs in Frome, Somerset

3-year warranty
On INNO fusion splicers and OTDRs

INNO Instrument
Exclusive business partner for the UK and Ireland

Talk to an engineer
Settings, error messages, or whether a machine needs to come in



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This guide is general advice for UK field conditions. Check the manual for your INNO model for exact figures and menus.