

Important warranty information concerning astronomical devices

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Please note: Although telescope lenses and mounts are obviously designed for outdoor use, the electronics is particularly sensitive to moisture or extreme temperatures and to temperature changes. Your mount may be damaged if it is exposed to the elements for a longer time or if it is stored under unfavorable conditions. Moisture may cause the surface of telescope mirrors and the coatings of optical parts to age at increased speed and it may damage the mechanics and electronics of mounts.

If you follow the advice given below, your telescope and its mount may serve you reliably for many years, even much beyond the expiry of our warranty period. Wrong handling or storage, however, may damage lenses and mount in ways that are not covered by our warranty. Handle your mount like you would any other high-quality electronics: Use it but do not expose it to avoidable strain.

Please, observe the following guidelines to protect your mount and avoid damage or even loss of warranty. In addition, we expressly refer to the rules regarding warranty in our Terms and Conditions (www.baader-planetarium.de)

Damage from overvoltage or short circuit:

1. Like with many other technical devices, opening the housing or the electronics of the mount within the warranty period may void our warranty. Even after the warranty period has expired you must not pull or plug any cables at motors or boards in the mount while the mount is connected to a power source. This includes any exposed connectors leading to the motors or the manual controller. This precaution applies to almost all mounts currently available on the market regardless of the manufacturer because plugging such a connection may destroy the motor controller (error message that may occur with Celestron mounts: No response 16/17). The cause of the damage can be detected by testing and is not covered by our warranty.
2. Connected cables may not be switched. The configuration can be different even though with some mounts, the cables for manual controllers or motors may fit into the same jacks. Hence, wrong wiring may produce short circuits that damage the electronics irreversibly. This cause of damage is also detectable on the defective board afterwards and may void our warranty. Always take care, hence, that the wiring is correct. Protecting caps (889002) do not only give protection against moisture, they also minimize the risk of wrong wiring
3. Do not remove the motor cover of the encoder (the black box right on every DC motor in the housing) without a suitable electronic measuring station (without broad daylight, for instance) and boots to protect from overvoltage and charge. Modern electronics in motors and encoders is very complicated and may not be examined or repaired without suitable tools or sufficient knowledge about potential damage. In this case, curiosity can have fatal consequences, unfortunately. Our warranty will also be void if an initial examination should find that an attempt has been made to open the motor cover (the encoder applied above the motor, that is).

Damage from using too low- or high-voltage power packs:

1. Too low power (much less than 12 V), starves the electronics. The servo motor gets too little voltage and the motor electronics is forced to compensate for the resulting lack of torque by increasing the power consumption to get more drive.

Especially at cold temperatures and/or with imperfect balancing of the two axles, motor management and the motor proper may quickly be pushed to the limits. As a consequence, the motor freezes and may whine because the power delimiter of the motor controller has to cut down at a specific amperage if there is not enough torque for driving, say, because the balance is imperfect. In this case all power is converted into heat and not into drive. Such stress can damage the involved components permanently.

If this happens repeatedly, damage may result whose cause is detectable. That's why we expressly recommend not to save in the power pack. Please, visit our website at

<http://www.baader-planetarium.de/sektion/s47/s47.htm> for special winter-proof power packs with slightly higher basic voltage.

The above-mentioned problem, of voltage drop due to low temperature, has been repeatedly reported by customers of cheap indoor Power Supply Units, for instance in this msg:
„at subfreezing temperatures our mount produces „a shrieking noise like a foghorn“ in RA. You suggested to try your Outdoor Power Supply and did supply one unit for testing. This is to confirm that the noise is gone and the mount functions perfectly – please send the invoice“ (translation of the feedback of Institute of Physics and Astronomy / University of Potsdam)

2. **Too high power** may in turn blow the power electronics (of the servo-motor controller in the motor or its board).

This may occur very quickly when too much power is fed. Make sure before connecting a power pack that the recommended voltage range cannot be substantially exceeded. 16 V are the common peak voltage that 12-V electronics can process. Besides, benchtop power packs are even more dangerous because they provide huge power reserves and one inadvertent turn of a button may conduct too high voltage - while the voltage delimiter is set too high - into the electronics of the mount. Too high voltage does not inevitably cause the electronics to fail because many of these circuits have their own voltage delimiters. But even then, this excess voltage exposes the electronics to strain with dangerous loads far beyond the operating point, which in the long run may cause permanent damage. The excessive power is necessarily transformed into heat that at some points may damage the semiconductors by overheating. Such damage is also not covered by our warranty if the failure is found to have resulted from overloading the electronics at the power input. Hence, use special care when applying an adjustable benchtop power pack or any with too high voltage and too much power reserve.

3. **EMC (electromagnetic compatibility):** We reserve the right to charge for any complaints because of malfunctions in electronic devices, CCD cameras or mounts that have been caused by customised additional equipment which does not comply with the European EMC directive or for any resulting expenses in working hours, spare parts applied in vain or carriage costs.

The EMC directive defines electromagnetic compatibility as follows: the ability of a device to work satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic interference that would be unacceptable to anything in that environment.

Many low-cost providers of power supplies and other electronic devices do not seem to take that provision serious any more. High-quality telescope electronics, in particular CCD cameras and mount electronics, have been found to suffer very frequently from inexplicable failures lately. We discovered to our surprise that many of these mysterious cases resulted from not properly radio-shielded voltage converters and power supplies from Eastern Asian property markets. As soon as all low-cost electrical systems all around the telescope were switched off or detached, many problems dissolved. Days may be wasted on such mysteries which is frustrating for both parties. That's why we also always require compellingly that the power supply involved is included in the return delivery. We are producing many power packs in Germany ourselves to deal with these problems and to exclude such failure in telescopes and mounts we have delivered.

Some basic essentials on the EMC directive: non-ohmic devices like voltage converters, inverters and power packs in particular are critical applications, to be precise: whenever the generally compatible 230-V AC grid or even a 12-V DC battery voltage is transformed or chopped by switch power supplies, inverters, voltage converters or even nearby machines with simple motors. The recently soaring rate of low-cost imports that do not comply with European standards (EMC directive) produce such failures with their ‚very cost-efficient primitive design‘. The steep voltage flanks originating from chopping generate harmonics and stimulate HF or UHF emissions at tiny metal parts. Even professionally protected CCD cameras and telescope electronics with properly filtered line inputs (without contamination by reverse currents on the cable) have a considerable chance of interference. Hence, legal provisions do not stipulate that the consumer should remain unaffected by interference but that, in any case, the emitters have to comply with the applying EMC directive. The polluter-pays-principle applies to this: exclude any possible interference before a faulty device should be classified as defective. Such time-consuming inspections may be performed only for a fee. You should eliminate all potentially interfering sources to exclude radio interference before you ask for chargeable repair or before you claim warranty.

Damage by moisture:

1. The following essentially applies to any electronics, all the same from which manufacturer: If you want to protect the mount and the built-in control elements against fast ageing, short circuits and loss of warranty, make sure that the inside of the mount - motherboard and motor boards - and above all the manual controller

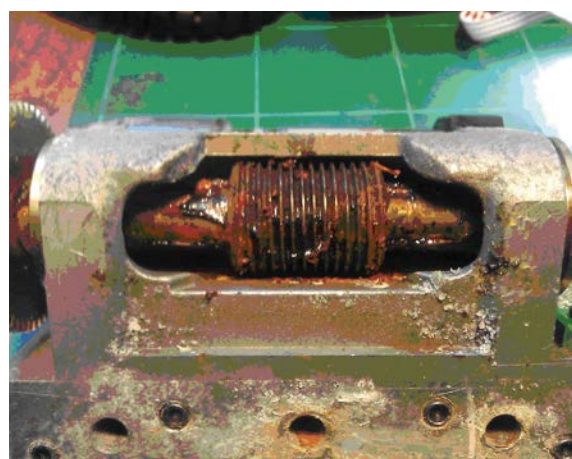
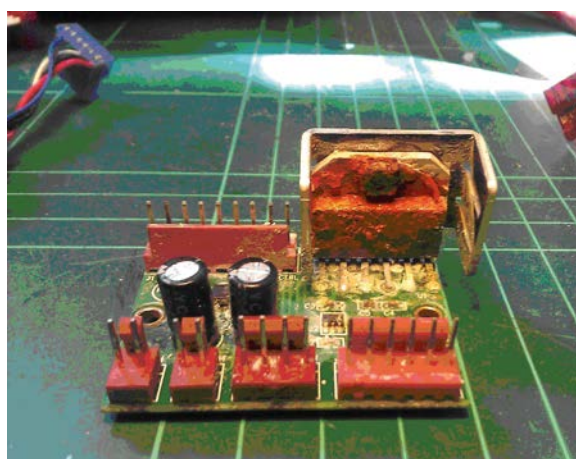
remain dry. This is the case in the standard operation mode of a telescope or mount under a clear sky with medium humidity below the dew point because the body temperature of the electronic parts prevent damage from condensation. The situation is different if the mount is standing outside for days and covered only with a plastic bag (or any other not thermally insulated cover) and exposed to harsh weather (rain, frost or heat). Under such conditions, condensating water may creep beneath the cover and accumulate in the mount into puddles. Such dampness can be detected by testing, like by examining the housing of the mount for any water stains inside. Resulting damage voids our warranty.

2. Telescope electronics must not be handled carelessly. Condensate or rainwater in a housing may also destroy the boards of very expensive mounts. Therefore, most upscale mounts allow to remove the main electronics and take it inside so that only the hardware will stay outside. As an alternative, the whole control may be permanently live (like a server) so that dew will not lead to inside damage. Make sure that the tracking is not moving while the mount electronics is live.
3. Cable entries that penetrate the mount or the manual control from above can duct remarkable quantities of dew along the cable into the housing and produce short circuits. Therefore, cables should always enter the housing of the mount or the manual controls from below when the mount is left outside or is put wet into a suitcase.
4. To protect against moisture or wrong wiring, we recommend to seal unoccupied jacks with protective caps so that dust and moisture cannot attach. For RJ45 jacks (PC connection) and RJ11 jacks (e.g., auto-guider jacks and Celestron manual controllers) we offer a set with protective caps (5x RJ11, 2x RJ45) under the order number #889002. These caps also minimise the risk of connecting accessories to the wrong port in the dark and to cause short-circuits.



Protective caps prevent that moisture can get in unoccupied sockets, or cables are connected incorrectly and cause short-circuit

Nearly all manufacturers of amateur- or semi-professional telescopes equip their devices with varnished boards. Yet these mounts must not be set up outdoors for a longer time without cover. If there is no suitable shelter available – a double-walled observatory dome with dehumidifier, for instance –, take the equipment indoors after your observing session so that the moisture will dry. If the equipment is not permanently stored indoors, take additional precautions to prevent moisture from penetrating. If damage by moisture entered because of improper storage is detected, our warranty claim is void !



In normal use, nothing happens to a mount even in humid nights - but if it is virtually standing in water as shown here, damage will occur that is not covered by our warranty. Always store dry when not in use - whether in the home or protected in a climate-controlled dome.

Often it is not made evident enough that modern mounts integrate as much electronics as a notebook or similar device. You would not leave a notebook or tablet outside or put it wet into a suitcase. These devices are not watertight, either, and yet used outside - but handled with more care later.

In the long run the prevailing amount of damage to manual control devices and defective boards of mount controls can be traced to short circuits and untimely ageing by penetrating moisture. If you take the precautions cited above to heart, you will enjoy flawless function of your control electronics even much after our warranty period has expired.

Notes to cable breakage and damage to electrical connections and plugs for the telescope control, and electronic accessories such as video modules, heated H-alpha filters and many other

Transportable telescopes

Put up all cable connections, so no cables lying around on the floor and directly to the tripod or pillar. In an inevitable lying on the ground cable for the power supply, make sure that the appropriate power supply is close to the column or below the tripod and the afferent power cord does not come from your main viewing direction.

Otherwise, you might stumble over one of the cables. Injuries while falling are not excluded and in the worst possible case it can happen that you outline the complete telescope with mount and tripod.

Insert cable plugs into the lead in loops and secure the loop with a cable tie (Fig. 02 and 03 below). To prevent by bending the cable directly at the plug cable breaks and at the now so filigree connectors such as USB 3.0 on video modules or RJ 11 connectors for car or Selfguiding ports damage to the connectors. In „bulky, hard“ cables (cold temperatures, see Fig. On the right), it is often sufficient, the cable through a loop, for example, supply via a clamping screw or driving the focuser the corresponding port on the mount or the camera.

Errors of connectors (eg Guiding, RJ 11) take a long time often only as a loose contact on and make a failure determination very time-consuming.



Cable Lock to H-alpha filters: looped, supplied laste steady USB 3.0 cable and power supply, attached to the focuser locking screw.



Figure 01: Re-open cable tie (knot ribbon). Figure 02 and 03: Cable loop directly to the USB 3.0 connector of SkyRis camera with tape knot to secure

Work portable, use cable ties which can be opened again (Fig. 01). They are found on the Internet – for example, Conrad Electronics – under the search term „Node Chains“, see also here:

<http://www.conrad.de/ce/de/product/543727/Knotenbaender-Loesbar-L-x-B-140-mm-x-39-mm-ABW-214-Farbe-Natur-10-St-PB-Fastener?ref=searchDetail>

Hard mounted telescopes

Here also applies fully the above. Although this mechanism do not knock down the telescope danger. For this is increasing the risk that – if you get stuck on a cable – the accessories will be torn out of the eyepiece or the connected accessories. **GENERAL** It applies all cables to connectors that are connected to an electronic module mount to relieve with a cable loop. As mounting location may be, for example, Plug shells accept – but only if the plugs are firmly screwed to the electronic box. Here can – instead of the above-mentioned node bands – also standard cable ties are used.

Some image examples:

Overview of Astrophysics GTO 1200th

From left to right: merged cable RS 232, Guiding and voltage supply of the GTO, intercepted cable on manual control connector and strain relief spiral cable remote control to the motor plug RA.



Picture center: Detail view of the merged cable RS 232, Guiding and Soannungsversorgung mount and strain relief connector on the manual control unit.

Right: Detail view of the strain relief of very severe Spira cable hand control unit Mount the plug of the RA motor cable.

Note on how to store Electronics

Toasted Spider on Paramount ME Board

This was the reason for a broken mainboard of a telescope mount. An insectproof housing is a good investment for a permanently mounted telescope.



The web is directly besides the power socket, but on the backside of the board. The spider could not be seen, perhaps it crawled into the socket and was toasted there. You can even see how the edge of the board was covered with the web.

Fogging of optics / dew moisture in telescopes

Occasionally customers complain especially Schmidt Cassegrain optics, because the Schmidt plate and / or the primary mirror inside „fogged“, and this fog does not disappear. Except for a few cases, these are the residues of condensed humidity, which has passed through unfavorable weather conditions and incorrect handling of the optics in the tube.

In physics textbooks we read: „The capacity of air to absorb water vapor increases with higher and falls with falling temperature,“, a very good explanation of this phenomenon can be found here:

<http://www.heiz-tipp.de/ratgeber-705-kalte-luft-ist-trocken.html>

Especially during a period sultry warm summer climate is consequently much moisture in the air in the great outdoors. If you open in this area, for example, a Schmidt Cassegrain telescope eyepiece before the observation night, then passes moist air into the tube. If one of the tube after night for observation outside, the water vapor condenses on the inside Tubuswänden, the levels, but especially at the Schmidt plate while the unit cools. If the unit is brought back into the warm apartment at the end of the night, it is internally fogged and the moisture comes very difficult to back out because the only opening through which they can escape the eyepiece is. The SC tube is effectively a „moisture trap“. Often these moisture triggers the slow warming of the tube in the course of hours back in the standing in the tube air -. The fitting disappear, at least temporarily, however, often remain even „edges“ or „cloudy“. structures can be seen only from a certain angle, and you can remove it only by brushing. The effect is the same as with any other disk (car). There it falls but only after a long time have to if enough hardware residues „summed“. At the car you simply dressing then the disc. With a telescope optical system such a fog falling on much stronger, because you look at this much more critical. Disc cleaning is also not so simple, because the interior of the optical tube not so is easily accessible. This should be done at a dealer best and costs due to the necessary adjustment thereafter – depending on the size of the optics of € 200,- to € 400,-. Therefore, one should urgently ensure that no moisture comes into the tube. And if it happened once, you should put the tube longer time with eyepiece open in the flat. It may take many days until this way, the tube interior is completely dry again, as well as behind the main mirror considerable amounts can be condensed moisture. Accelerating effect a desiccant cartridge or a cloth bag with silica gel that you put into the eyepiece. This is, for example, Available here:

<http://www.baader-planetarium.de/sektion/s19/s19.htm#silikagel>

But – as I said – over the years will always fitting residues form on all optical surfaces that do not disappear when drying. While this is uncomfortable with closed optical systems such as SC telescopes because you zoom comes badly to the surface to be cleaned. On the other hand one can see very well how much better a closed look the sensitive mirror surfaces against aging protect than is the case with an open tube. When comparing the reflectance of a SC Telescope and a Newtonian reflector system after 10 years of useful life, you can prove that the closed optics in much better condition and is substantially more light brings into focus – despite all fitting tracks. A fitting on a Schmidt plate is indeed aesthetically unattractive, but it affects a much lesser extent on the imaging performance of the optic as an aged, tarnished main mirror in a Newtonian telescope.

Important note on how to store lenses

Your telescope will keep its full power even after many years if you store it save and dry. We have seen thirty years old Schmidt-Cassegrain telescopes whose reflecting surfaces were like new due to the way the Schmidt plate had been protected. However, wrong (humid) storage or improper cleaning may very quickly damage a telescope beyond repair.

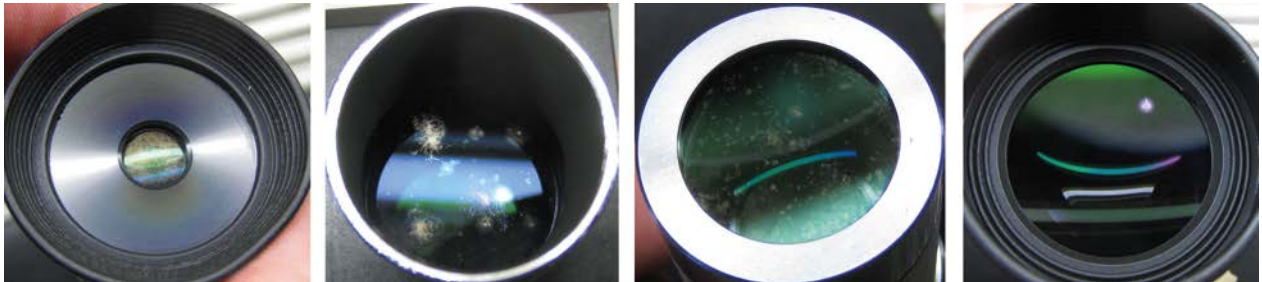
Even though a telescope will not suffer damage from becoming cold or wet, you should avoid powerful, brief thermal shocks that might produce tension.

When you take your telescope out of a cold night into your warm house, moisture may condense on the instrument. Allow it to dry with the protective covers off so that any moisture will evaporate. Leave the suitcase of telescope and oculars open as well or else moisture will gather in the telescope or its wrapping and create a per-



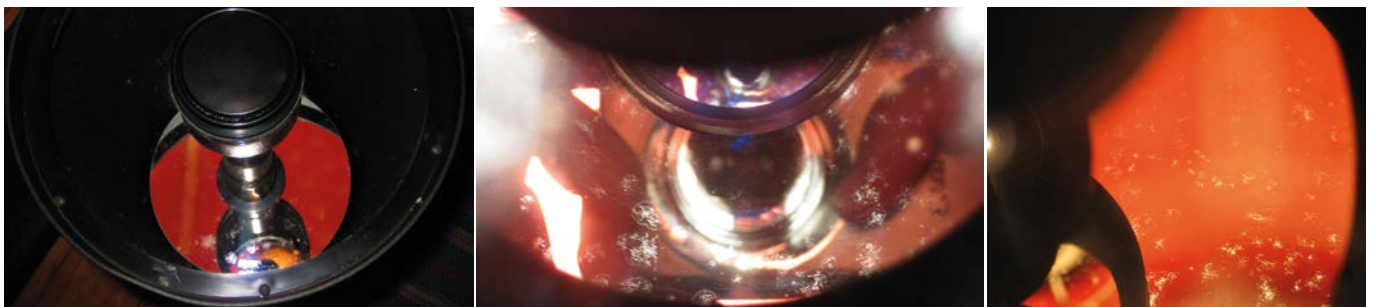
C14 EdgeHD with fogged Schmidt plate (in the right third, diagonal)

fect climate for mould and fungus to thrive. Lens fungus is an umbrella term for a whole range of mould or fungi that feed on substances used in making lenses or deposited on the lens as dirt. They can damage coating and glass – keep your telescope therefore in the dark, dry, not too warm and well ventilated to avoid mould. Fungi are very resistant and almost impossible to eliminate; fungus spores have even survived a vacuum. Damage to coating or glass by fungus infestation cannot be remedied and is not covered by our warranty.



These eyepieces are infected by lens fungus. The ocular on the left is fully overgrown, the right ocular is only little infected.

Yet do not clean your telescope too often. Dust affects the image quality little but scratches from improper cleaning may cause permanent damage and, worse, create additional surface for fungus to settle on. Fingerprints, eyelash grease and polling should be removed soon, however, because the coating is sensitive to acids and ethereal oils contained in these. Baader Optical Wonder cleaning liquid has shown to be effective here (#2905007, <http://www.baader-planetarium.de/sektion/s19/s19.htm>), it is also antiseptic with regard to spores. You may find notes on how to clean in the operating instructions of your Celestron telescope in your native language.



These images show the view into a Schmidt-Cassegrain, which was stored at moist-warm climate near the ocean for some years. Even the closed tube of a SC was no protection against fungus under this conditions.

Important note on all firmware updates

Updates for software or firmware are provided by the equipment maker. Please, note that Baader Planetarium is not liable for any damage to software or hardware even though it may be provided for download on our website. Make sure before updating that the software chosen is compatible with your mount and manual control model. Do not press any button at the manual controller while updating and do not detach the PC from mount or control! Otherwise the electronics may be irretrievably damaged. This constitutes false operation and any resulting need for repair will not be covered by legal warranty.

Important note on locating faults in computerised manual controls

Modern computerised manual controls provide a huge number of setting options. As a result, it may seem at times that a telescope does not behave as expected. One reason may be that two selected options are in conflict with each other. Try resetting the software to factory settings – notes on how to do this are included in the operating instructions of your telescope.

If the software of the manual controller does not boot any more (Celestron mounts will then produce the error message, Boot Loader Error), a flipped memory bit may be at fault. Try a firmware update, in most cases the error will be gone afterwards.

Important note on spare parts

We can warrant the function of spare parts only if we also assemble and check them or if advanced repair is performed by authorised workshops at selected dealers. Unfortunately, faults cannot always be traced to a single defective part. Other parts may also have been affected by the defective part even if that is not immediately obvious. In the worst case, a spare part will be destroyed by other defective parts when an attempt to remedy is made. Differing software versions of the substituting parts may also cause trouble. Hence, we do not usually sell single electronics or optical spare parts but carry out this repair at our site when possible or else discuss every case with your responsible dealer and provide the parts needed for every isolated case.

If you yet want to carry out advanced repairs yourselves, we can sell spare parts only for advance payment, without warranty and without right of return. Assemble at your own risk. The warranty is automatically void if a spare part was not properly assembled by a professional workshop.

Spare parts are not available in unlimited numbers, therefore we can issue them only to our own customers or to customers of authorised German dealers. To verify your purchase, we need evidence (copy of the invoice) for your equipment. If you need any spare parts for equipment obtained from abroad, please, turn to your responsible dealer or supplier. See the also Terms and Conditions/warranty conditions.

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