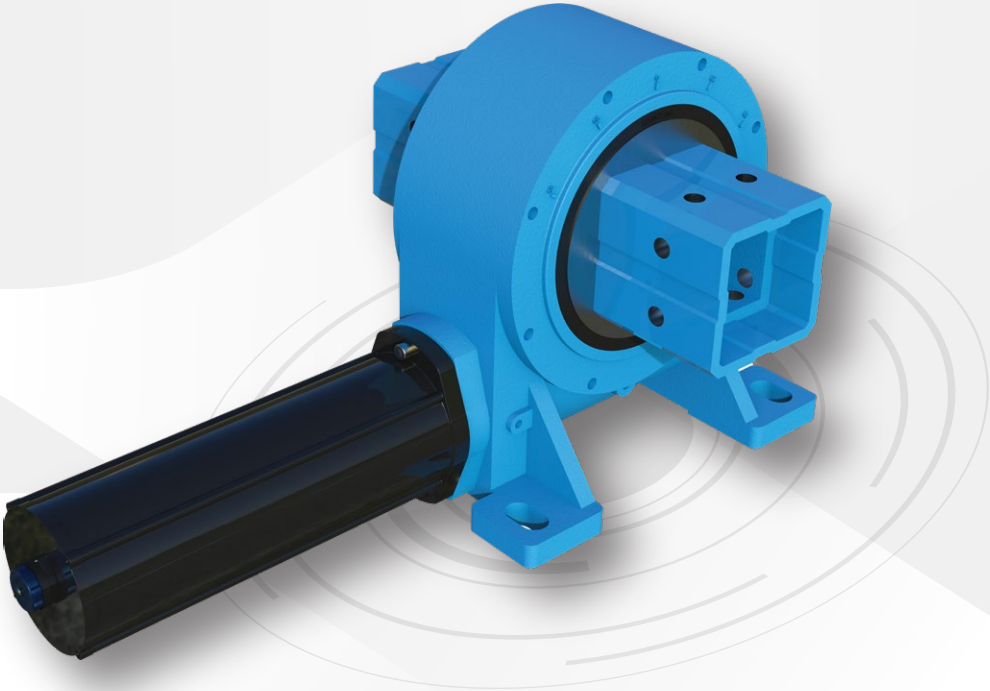
REMAK SOLAR



Solar Tracker ST 7

User Guide

REMAK Gearbox

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USER MANUAL DESCRIPTION

This user manual is part of the Solar Tracker ST7 Solar Tracking System and has been prepared by Remak Redüktör Makina Sanayi Tic. Ltd. Şti.

The primary purpose of the user manual is to familiarize the user with the system and to ensure that the system is operated in accordance with the rules specified in the manual, considering system security and human health. Any actions taken outside the instructions in the user manual will void the warranty. Therefore, users should keep the user manual for the entire duration of system use.

POINTS TO CONSIDER DURING PREPARATION FOR DELIVERY, LOADING AND TRANSPORTATION

Care must be taken during the loading and transportation of the machine. Impacts, friction, and scratches should be avoided. Appropriate equipment should be used when loading and unloading the machines onto the transport vehicle.

POINTS TO CONSIDER DURING MACHINE ASSEMBLY

The machine must be assembled by technically competent personnel following the instructions in the User Manual. The manufacturer will not accept responsibility for any malfunctions that may occur otherwise.

ATTENTION AND OCCUPATIONAL SAFETY

All procedures performed during the assembly of the machine must be carried out in accordance with occupational safety measures. The machine must be put into operation by authorized personnel using appropriate equipment. The machine is delivered with all electrical wiring already installed. Making any changes or interfering with the system will damage the existing system and carry the risk of harm to the person or the machine.

FEATURES

Ease of Connection:
120mm x 120mm square profile, frequently used in solar panel installations, and a design that facilitates easy connection.

Solar Tracking Mechanism:
A single - axis intelligent tracking system that automatically monitors the sun's movement throughout the day. Provides maximum energy production compared to fixed systems.

Energy Efficiency:
Energy efficiency increase of up to 20-25% thanks to the precise control algorithm that optimizes panel angles. Low energy consumption motor and drive system.

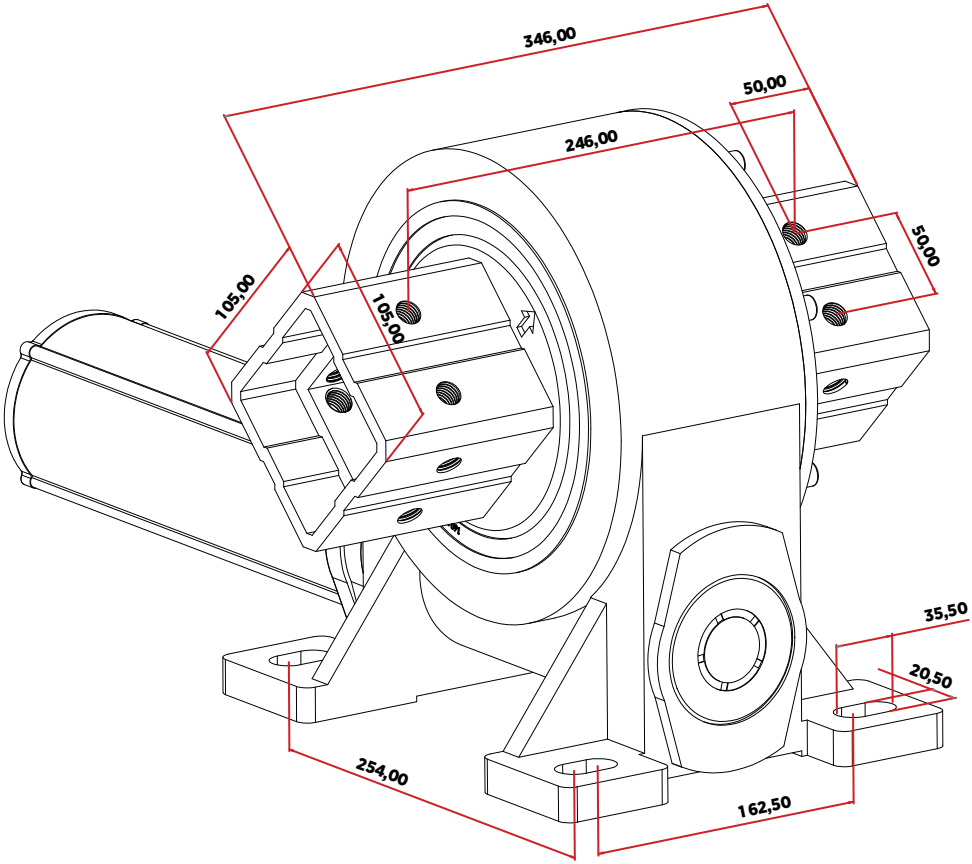
High-Strength Body:
Extra robust and strong static load resistant gearbox housing manufactured with special techniques.

Intelligent Control Unit:
An automated control system powered by an embedded software algorithm and GPS sensor. Optimal positioning throughout the day without the need for manual intervention.

Durability & Safety:
Windproof, rainproof, and durable construction resistant to harsh outdoor conditions. Automatic protection and safe positioning feature in extreme weather conditions

Modular Design:
Modular design provides easy assembly, maintenance, andservicing advantages. A solution compatible with different terrain and panel types.

TECHNICAL SPECIFICATIONS



**Remak Redüktör Mak. San. Ltd. Şti. reserves the right to change the dimensions.*

INSTALLATION STEPS

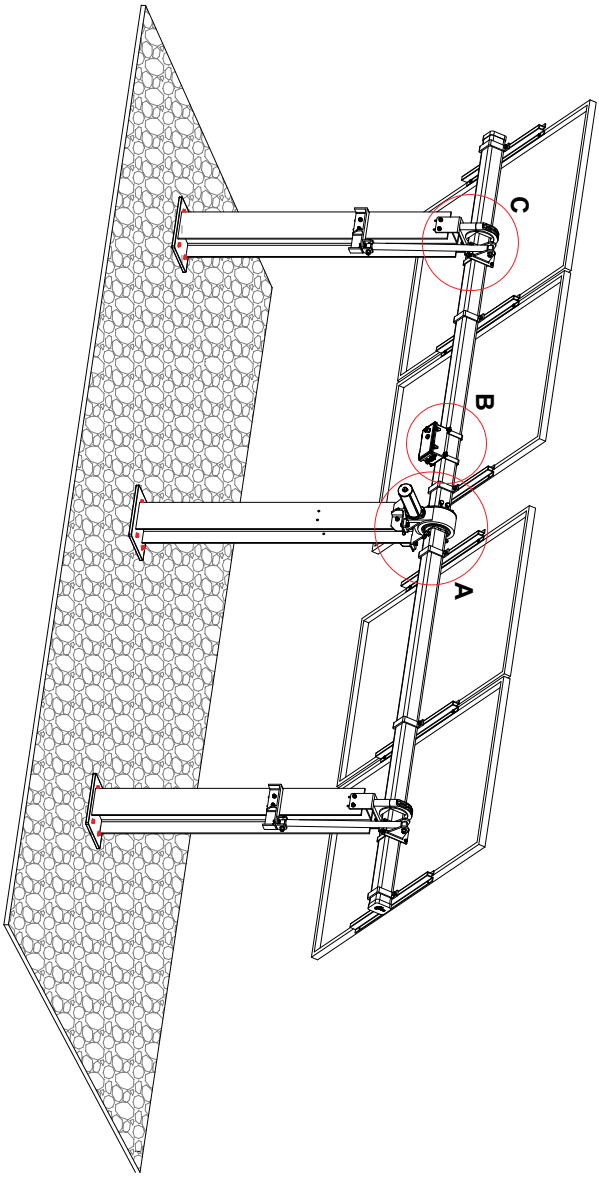
Please carefully review the following points before installation. To eliminate unforeseen risks during installation and to ensure a quick and safe installation, please complete the following checklist entirely.

Detailed examination of the area where the solar tracker system will be installed.

- The installation location should be chosen so that the system receives uninterrupted sunlight throughout the day.
- The ground structure must be strong enough to withstand the weight of the supporting structure and wind loads.
- Within the panel and mechanical movement area, there must be no structures, trees, or elements that w ould obstruct the system's rotation and angle.
- Sufficient distance must be left for back tracking so that the panels do not shade each other depending on the angle of the sun.
- Considering wind load and environmental factors, the system's anchor and connection points must be securely positioned.
- Electrical and control wiring must be insulated to withstand outdoor conditions and secured in a way that prevents mechanical movement.
- At the installation site, cranes, aerial platforms, or lifts must be used to safely mount heavy equipment. Otherwise, serious workplace accidents may occur.

Considering all the points mentioned above, the assembly phase can begin.

ASSEMBLY SECTION

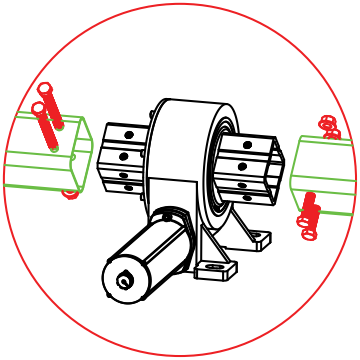


EXAMPLE SOLAR TRACKER SYSTEM INSTALLATION

ASSEMBLY SECTION

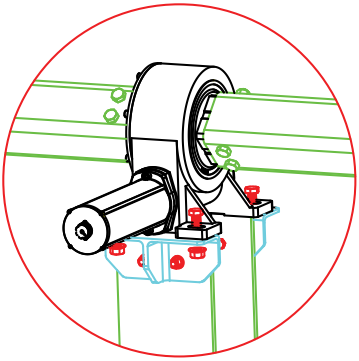
A-1 Gearbox Connection

The arms of the Solar Tracker Gearbox are fixed to 120mm x 120mm profiles with 4 M16 bolts each.



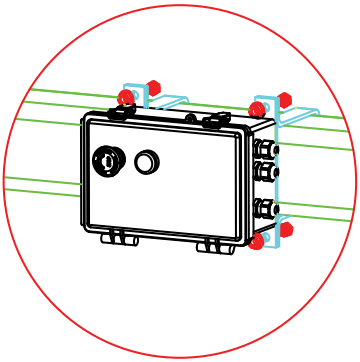
A-2 Gearbox Connection

The Solar Tracker gearbox is secured to the pre-attached pole mounting bracket with four M16 bolts.



B-1 Automation Box Connection

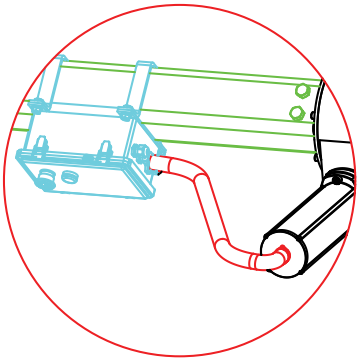
The automation box is secured to 120mm x 120mm profiles using clamps and four M10 bolts.



ASSEMBLY SECTION

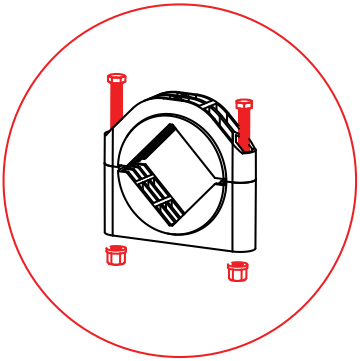
B-2 Automation Box Connection

It needs to be connected to the motor of the Solar Tracker gearbox by connecting to the input furthest from the other two of the 3 sockets on it.



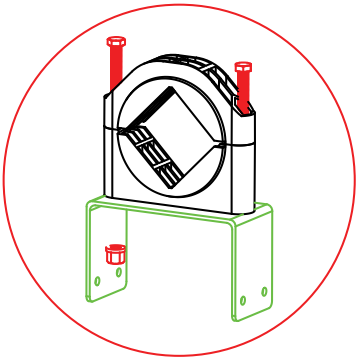
C-1 Profile Bed Connection

The bearing part of the profiles consists of 4 parts. These parts must be tightened with M16 bolts. The profile bearing bolts should not be overtightened in order to provide ease of movement and angle tolerance to the profiles.

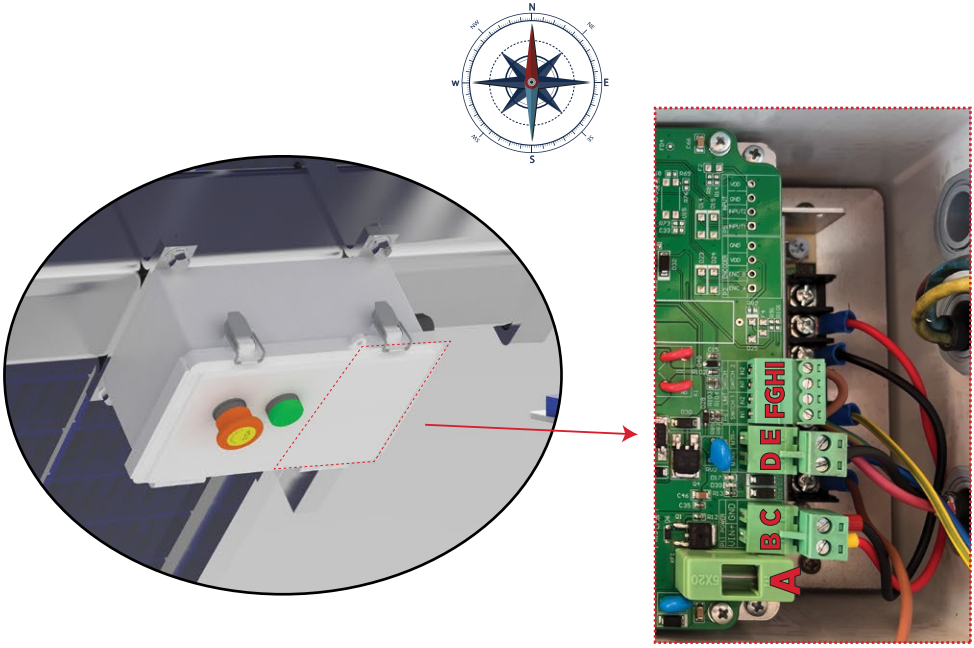


C-2 Profile Bed Connection

The support part of the posts must be fixed to the lower surface with bolts.



ELECTRICAL CONNECTION DIAGRAMS



Pin	Function	Explanation
A	Insurance	For power line protection, a 5x20 mm, 10A delayed type is recommended.
B	V+ (24V DC)	The positive terminal of the power supply.
C	V- (GND)	The negative terminal of the power supply.
D	Engine - or Engine +	
E	Engine + or Engine -	
F	Swich 1 IN1	Limit swich input line (1. swich'in 1. pini).
G	Swich 1 IN2	Limit swich input line (1. swich'in 2. pini).
H	Swich 2 IN1	Limit swich input line (2. swich'in 1. pini).
I	Swich 2 IN2	Limit swich input line (2. swich'in 2. pini).

IMPORTANT WARNING

The system must not be powered on before the final installation of the Automation Box is complete; otherwise, the warranty will be void.

Remak Gearbox is not responsible for any damage or accidents that may occur due to incorrect installation or improper use of the Automation Box product. Installation should only be carried out by rained and authorized personnel.

Any operation not in accordance with this user manual may result in damage to the device, personal injury, and void the warranty.

Ensure the emergency stop button on the box faces south and is positioned parallel to the panels.

The "Limit Angle" and "Maximum Angle" parameters must be set correctly.

The limit angle must always be greater than the maximum angle. Also, the Night Angle and Manual Angles must be smaller than the Maximum Angle.

The screws on the profile bearings should not be tightened too much. They should be left slightly t loose. If excessive pressure is applied to the profile, both the current drawn by the motor may increase and the profiles may be damaged.

TROUBLESHOOTİNG (FAQ)		
TROUBLESHOOTİNG (FAQ)	**REASON**	**THE SOLUTION**
THE LED BLINKS ON AND OFF EVERY 2 SECONDS.	This indicates that the engine directions are incorrect.	Reverse the motor wires (swap D and E) and ensure the LED remains continuously lit.
THE STATUS LED SHOULD START FLASHING AGAIN EVERY 2 SECONDS AT ANY TIME AFTER INSTALLATION.	The problem could be mechanical jamming, motor failure, or a loose or broken motor cable.	Please check the system or contact Remak Solar technical support.
120mm x 120mm THE PART OF THE PROFILES CLOSE TO THE MOTOR ROTATES, BUT THE ROTATION RATIO DECREASES AS IT MOVES AWAY FROM THE CENTER.	The screws on the profile bearings may be overtightened.	Loosen the screws on the profile bearings slightly.
THE MOTOR RUNS FOR 1 SECOND AND STOPS FOR 1 SECOND.	There might be a problem with the current or voltage.	Check the current and voltage levels.
STATUS LED FLASHES ON AND OFF EVERY 4 SECONDS.	A motion sensor error.	Check the motion sensor, replace it if necessary.
THE STATUS LED FLASHES ON AND OFF EVERY 6 SECONDS.	The system is outside the expected angle range.	Manually move the motor to the correct position and restart the system.
THE STATUS LED FLASHES ON AND OFF EVERY 8 SECONDS.	A motion sensor error.	Check the motion sensor and replace it if necessary.

CHECKLIST		
Control Department	**Cleaning / Maintenance**	**Control**
Gearbox	**Grease application every 6-12 months.**	**Inspect the gearbox housing for any deformations and check the oil plug/seal.**
Engine	**Cleaning the engine mounting components. Cleaning the engine mounting components.**	**Ensure the engine mounting bolts are securely fastened and listen to the engine sound.**
Profile bed	**Applying grease to the inner surfaces of the mattresses every 6-12 months.**	**Checking the tightness of the profile bearing bolts and observing any deformation in the profile bearing.**
automation box	**The box is opened and the inside is cleaned of liquids, moisture, and dust.**	**Making cable connections and checking LEDs.**

WARRANTY CONDITIONS

Provided that the instructions, warnings, and standards stated in the user manual are followed, Remak Solar branded products are covered by a 2 (two) year warranty against manufacturing defects*

- The time spent on repairs within the warranty period will be added to the warranty period.
- The warranty period of the replaced product during the warranty application is limited to the remaining warranty period of the purchased product.
- Digital and electronic malfunctions are covered by the warranty processes of the relevant circuit board manufacturer. Remak Solar brand is not a decision-making authority, but follows the warranty processes of the circuit board manufacturer. The costs of repairs and maintenance will be communicated to the user.
- The warranty period starts from the date of delivery of the product to the company and the warranty period is 2 (two) years from the date of delivery.
- Delivery costs and performance are the responsibility of the buyer requesting warranty coverage.
- The use of this Warranty Certificate is authorized by the T.C. Ministry of Science, Industry and Technology, General Directorate for Consumer and Competition Protection, in accordance with the Law No. 4077 on Consumer Protection and the Communiqué on the Principles of Application of Warranty Certificates issued based on this Law.

**GENERAL MATTERS EXCLUDED FROM WARRANTY COVERAGE:

- The Solar Tracker motor burning out due to operating above its capacity and drawing high current.
- The Solar Tracker gearbox breaking its gears due to operating above its capacity.
- Breaking the stage inside the housing by rotating it completely outside the angles allowed by the existing system.
- Any physical impact on the system.
- Interfering with the motor system and removing its insulation.
- Product-related defects originating from the existing electrical system.
- Accidents resulting from faulty and unbalanced installation due to construction issues.
- Failure to mount the device with the appropriate equipment according to the assembly diagram in the user manual.
- The Solar Tracker failing to complete its movement due to overtightening of the profile bearings.
- Damage to the gearboxes due to angle and alignment problems caused by landslides and soil subsidence.
- Problems caused by unprevented wind and snow loads on the system. - Damage and malfunctions caused by transportation, unloading, loading, storage, external physical (impact, collapse, breakage) and chemical factors after delivery of the device.
- Damage andmalfunctions caused by environmental factors (earthquake, fire, flood, water damage, lightning strike, humidity, exposure to frost, operation without lubrication). *The end user who purchases the device accepts all warranty terms and general matters not covered by the warranty.*

Our product, details of which are provided below, is covered by a warranty of at least 2 (two) years and/or according to the value determined by the unit of measurement specified by the Ministry.

Warranty Statement

Warranty Statement

Manufacturer's Name: Remak Redüktör Mak. San. Ltd. Şti.

Main Factory Address: Kemalpaşa Organized Industrial Zone / Kuyucak Road No: 211 Kemalpaşa / İzmir

Telephone: 0 (232) 479 68 48/0 (232) 479 68 49

Product Name: REMAK SOLAR TRACKER

Brand: REMAK SOLAR

Origin: Türkiye / İzmir

Model Type:

Year of Manufacture:

Serial Number:

Delivery Date:

Warranty Period: 2 Year

Maximum Repair Time: 15 Working Day

Seller Company Stamp:	Manufacturer's Stamp: