



CROSS 200

Sub-Meter GNSS Smart Antenna

Installation & User Manual

PRODUCT CODE KYP036

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About this Document

Document Information

Document Type	Installation & User Manual
Document Abstract	Overview and detailed instructions for the installation and use of the CROSS 200 Sub-Meter GNSS Smart Antenna
Product	CROSS 200 (KYP036) with 3 m connection harness (KYP054)
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1.	0.1	30-Sep-2026	First Release
2.			
3.			

This manual is an integral part of the product and must accompany it in case of sale or change of ownership. Keep it for future reference. Tim reserves the right to modify product specifications and instructions at any time without notice.

1. Symbols & Abbreviations



The installation tasks described in this manual must be performed by qualified technicians only.

1.1 Symbols Used

The following types of safety instructions and general information appear in this document:

Symbol	Type of Hazard	Description
	DANGER	Indicates a hazardous situation that needs immediate attention. If not avoided, serious injury or even death may occur.
	WARNING	Indicates a hazardous situation that could lead to death or serious injury if precautions are not taken.
	CAUTION	Indicates a situation that might result in minor injury or damage to the product if not avoided.
	NOTE	Provides tips that are valuable for the optimal operation of your product.

1.2 Abbreviations

Term	Meaning
GNSS	Global Navigation Satellite System (GPS, Galileo, BeiDou, QZSS, NavIC)
SBAS	Satellite-Based Augmentation System – free correction service (EGNOS, WAAS, MSAS, GAGAN)
L1 / L5	The two GNSS frequency bands received by CROSS 200 (1575.42 MHz / 1176.45 MHz)
NMEA 0183	Standard serial data format used by GNSS receivers and guidance displays
CEP	Circular Error Probable – radius containing 50 % of the position fixes
TTFF	Time To First Fix – time from power-on until the first valid position
RS-232	Serial communication interface used for the position data output
VDC	Volts, direct current

2. Before Using the Product



Carefully read all the safety instructions. Otherwise, there is a risk of accident, injury or damage to the product.



Never clean the antenna or the machine it is installed on with direct high-pressure water jets.



Do not use solvents or fuel to clean the outer surface of the housing.



Comply with the specified supply voltage: **12 VDC**. Do not connect CROSS 200 directly to a 24 V supply.



Before any electric arc welding on the machine, disconnect the harness connector from the antenna.



Only use genuine Tim harnesses, spare parts and accessories.

2.1 Intended Use

CROSS 200 is a dual-band (L1/L5) GNSS smart antenna for agricultural machinery. It receives satellite signals, calculates position, speed and heading, and sends this information in standard NMEA 0183 format to a connected guidance or section-control computer – typically a Tim NOVA 200, NOVA 210 or NOVA 2N.

Any other use is considered improper. Tim is not liable for damage resulting from improper use or failure to observe this manual.

2.2 Important Safety Instructions

2.2.1 Electrical safety



This is an electrical product. Incorrect wiring may damage the product or the vehicle electrical system.

- Connect the antenna only with the supplied harness (KYP054) to the Tim computer or to a fused 12 VDC supply.
- Do not route the harness near hot parts, sharp edges or moving components.
- Do not open the housing. There are no user-serviceable parts inside; opening the housing voids the warranty.

2.2.2 Electrostatic discharge

- Electronic components inside the product are sensitive to electrostatic discharge (ESD). Touch a grounded metal part of the machine before handling the connector.

2.2.3 Installation pre-requisites

1. The machine is switched off and parked safely on level ground.
2. Safe access to the cab roof is available (use a stable ladder or platform).
3. The mounting surface is clean, dry and free of dust, oil and paint flakes.
4. All federal, state and local site safety requirements are in place.

2.3 Radio Frequency Interference

CROSS 200 receives very weak satellite signals. Strong nearby transmitters or electrical noise can reduce accuracy. If you notice interference:

- Increase the distance between CROSS 200 and radio antennas, mobile-phone boosters or other GNSS antennas.
- Route the antenna harness away from ignition leads, alternators and high-current cables.
- Contact your Tim dealer if the problem persists.

3. About the Product

3.1 About CROSS 200 (Sub-Meter GNSS Smart Antenna)

CROSS 200 combines a survey-grade dual-band antenna and a multi-constellation GNSS receiver in one weather-protected octagonal housing. It tracks GPS, Galileo, BeiDou, QZSS and NavIC on both the L1 and L5 bands, and uses free SBAS corrections to deliver sub-meter class positioning at 10 updates per second. A single cable carries power and position data, so the antenna connects directly to your Tim computer.

Key capabilities include:

- **Sub-meter class accuracy:** SBAS-corrected positioning for automatic section control and A-B guidance – no subscription needed.
- **Dual band L1 + L5:** the second frequency makes the position more stable under trees, next to buildings and between orchard rows.
- **Multi-constellation:** GPS, Galileo, BeiDou, QZSS and NavIC tracked concurrently for more satellites in view.
- **10 Hz update rate:** fast, smooth position stream for accurate section switching and track following.
- **One-cable connection:** power and NMEA data over the 3 m M12 harness (KYP054).
- **Status LED:** shows power and satellite fix at a glance.
- **Magnetic base:** fast installation on the metal roof of the tractor cab.
- **Rugged housing:** sealed housing with pressure-equalizing vent, operating from –35 °C to +80 °C.

3.2 Product Overview



Note: The final product may differ from the illustration depending on the production batch and customer specifications.

Sr. #	Part Name	Function
1.	Radome (antenna cover)	Protects the dual-band GNSS antenna. Must have a clear view of the sky.
2.	Tim product label	Product identification. The label is on the top side.
3.	M12 connector (4-pin)	Power supply and NMEA data. Connects to harness KYP054.
4.	Status LED (green)	Shows power and satellite fix status – see section 5.2.
5.	Housing base	Contains the receiver electronics; magnetic base on the bottom side.

3.3 Dimensions

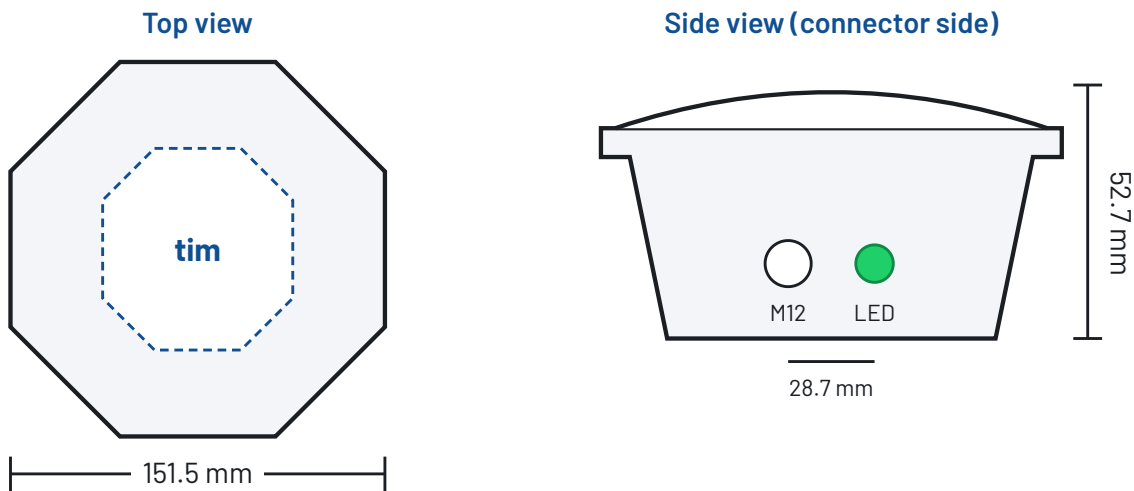


Fig. 1 – CROSS 200 dimensions (octagonal housing, 151.5 × 52.7 mm)

3.4 Specifications

Specifications	Values
GNSS performance	
Receiver	Dual-band (L1 + L5) multi-constellation GNSS receiver
Constellations & signals	GPS / QZSS L1C/A + L5 · Galileo E1 + E5a · BeiDou B1C + B2a · NavIC L5
Correction	SBAS (EGNOS, WAAS, MSAS, GAGAN)
Position accuracy	Sub-meter class – 1 m CEP (open sky, SBAS)
Velocity accuracy	0.05 m/s
Update rate	10 Hz
Time to first fix	Cold start ≈ 28 s · Hot start ≈ 2 s (typical, open sky)
Data output	
Interface	RS-232 serial
Protocol	NMEA 0183, version 4.11
Port settings	57 600 baud, 8 data bits, no parity, 1 stop bit (8N1)
Messages	GGA and RMC at 10 Hz · ZDA at 1 Hz
Electrical	
Supply voltage	12 VDC nominal (18 VDC max.) – supplied by the Tim computer
Protection	Reverse-polarity protected
Connector	M12, 4-pin, A-coded
Status indicator	Green LED
Mechanical & environmental	
Dimensions	151.5 × 52.7 mm (octagonal housing)
Mounting	Magnetic base
Housing	Sealed plastic housing with pressure-equalizing vent
Operating temperature	–35 °C ... +80 °C
Codes	
CROSS 200 Smart GNSS antenna	KYP036
Smart GNSS harness, 3 m (M12 4-pin → GX12 4-pin)	KYP054

Accuracy and TTFF depend on sky visibility, satellite geometry, ionospheric conditions and SBAS availability.

4. Installation



The installation must be carried out by a skilled professional only. Work at height only with a stable ladder or platform.

4.1 Positioning

The position of the antenna determines the quality of the position data. Observe the following requirements:

- **Highest point:** mount CROSS 200 on the highest point of the vehicle (normally the cab roof), so that the view of the sky is as wide as possible in all directions.
- **Center line:** mount the antenna exactly on the longitudinal center line of the tractor. The NOVA computer calculates section positions from this point.
- **Connector to the rear:** orient the antenna so that the M12 connector and the harness point towards the rear of the machine.
- **Level:** the mounting surface must be flat and horizontal.
- **Free of obstacles:** keep away from beacons, air-conditioning units, other antennas and any part that rises above the antenna.

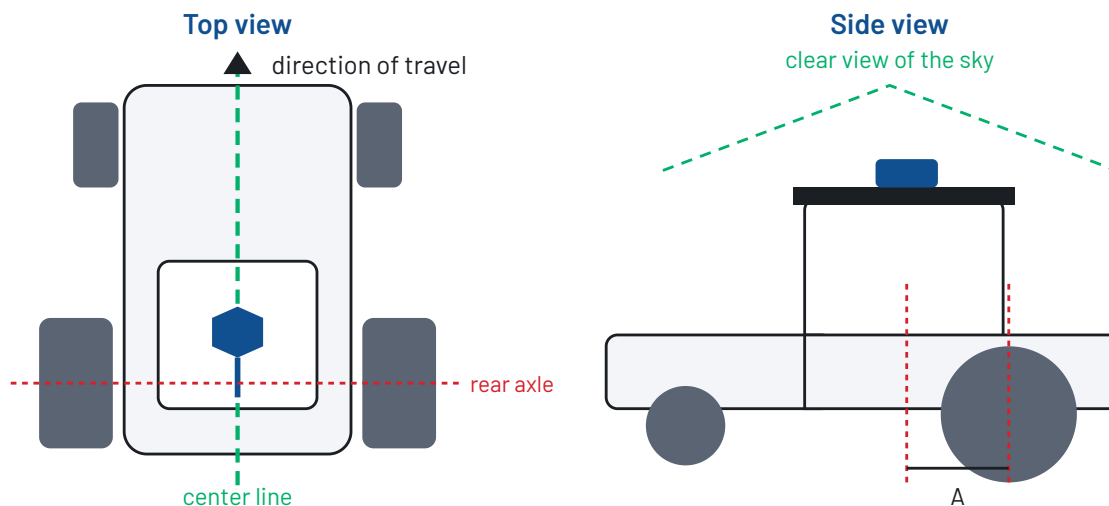


Fig. 2 – Antenna on the cab roof, on the center line, connector to the rear. A = distance antenna → rear axle.



Measure distance **A** (antenna → rear axle) with a tape measure and write it down. It is entered in the NOVA computer as *GPS Antenna Rear Axle* (see section 5.3).



CROSS 200 does not compensate for roll and pitch. On steep slopes the antenna position shifts sideways relative to the ground; take this into account when working on hillsides.

4.2 Mounting

Step 1. Clean and dry the mounting area on the cab roof.

Step 2. Place CROSS 200 on the marked point on the center line, connector towards the rear. The magnetic base holds the antenna on a flat steel surface.

Step 3. If the cab roof is made of plastic or aluminium, first fasten a flat steel plate (not supplied) securely to the cab structure, then place the antenna on the plate.

Step 4. Check that the antenna sits flat and cannot slide when pushed by hand.



It is the operator's responsibility to ensure that the antenna is fixed securely. Check the fixing regularly – especially before road transport and after working under low branches. Tim is not liable for any damage if the antenna comes off.

4.3 Wiring Connection

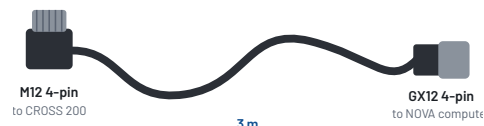
Step 1. Switch off the NOVA computer.

Step 2. Align the key of the **M12** connector of harness KYP054 with the antenna socket, push it in straight and tighten the knurled nut **by hand** until it stops.

Step 3. Route the harness along the cab frame into the cab. Leave a small drip loop next to the antenna so that water cannot run along the cable into the connector.

Step 4. Connect the **GX12** connector to the GNSS input of the NOVA computer and tighten its nut by hand.

Step 5. Fasten the harness with cable ties every 30–40 cm. Do not pull, twist or bend it sharply, and keep it away from doors, hinges and moving parts.



KYP054 – Smart GNSS harness, 3 m
M12 4-pin (antenna) → GX12 4-pin (computer)



Do not force the connectors. Bent pins or a crossed thread damage the contacts and the sealing. Never use tools to tighten the connector nuts.



Use only harness KYP054. Harnesses not supplied by Tim may have a different pin assignment and automatically void the warranty. For connection to third-party displays, ask your Tim dealer for the correct harness.

5. Operating Instructions

5.1 First Operation

Step 1. Park the tractor outdoors with a clear view of the sky (not in a shed or next to tall buildings).

Step 2. Switch on the NOVA computer. CROSS 200 is powered through the harness; the status LED starts to flash.

Step 3. Wait until the LED is steady on. Under open sky the first fix normally takes less than one minute; the very first start at a new location can take a few minutes longer.

Step 4. On the NOVA computer open *HOME* → *Data Display* → *GPS Data* and check that latitude, longitude, number of satellites and HDOP are displayed.

5.2 LED Signals

The green LED next to the connector shows the operating status of CROSS 200:

LED	Meaning	Action
 OFF	No power supply	Check the harness connection and that the NOVA computer is switched on.
 Flashing (1 × per s)	Powered – searching for satellites, no valid position yet	Wait. If it keeps flashing, check the view of the sky.
 Steady ON	Valid satellite position (fix)	Ready for operation.

5.3 Settings on the NOVA Computer

CROSS 200 needs no configuration of its own. Make the following settings on the NOVA 200 / NOVA 210 / NOVA 2N computer:

Menu	Setting
HOME → SETTINGS → Tractor → <i>GPS Antenna Rear Axle</i>	Enter distance A measured in section 4.1 (antenna → rear axle).
HOME → SETTINGS → Rate Control Settings → <i>Speed Source</i>	Only GPS – speed from CROSS 200, or Wheel + GPS if a wheel sensor is also installed.
HOME → Data Display → <i>GPS Data</i>	Check position, number of satellites, HDOP and speed.



Incorrect tractor geometry or antenna position causes section control and guidance errors. Measure all distances with a tape measure.

5.4 Use with Other Displays

CROSS 200 outputs standard NMEA 0183 data and can feed other guidance displays that accept an external GNSS receiver. Configure the display serial port to **RS-232, 57 600 baud, 8N1**; CROSS 200 sends **GGA** and **RMC** at 10 Hz and **ZDA** at 1 Hz. Ask your Tim dealer for a suitable harness and check the supply voltage of the display (12 VDC).

6. Maintenance & Troubleshooting

6.1 Maintenance

- Clean the radome with a soft cloth, water and mild detergent. No high-pressure cleaners, solvents or fuel.
- Check the harness, the connectors and the fixing of the antenna at the start of every season.
- Remove snow, ice, mud and leaves from the radome – they weaken the satellite signals.
- When the machine is stored for a long time, you may remove the antenna and keep it in a dry place.

6.2 Troubleshooting

Problem	Possible cause	Remedy
LED off, no GPS data	No power supply	Check that the NOVA computer is on and that both harness connectors are fully tightened.
	Damaged harness	Inspect the harness for cuts or crushed sections; replace KYP054 if damaged.
LED keeps flashing	No view of the sky	Move the machine outdoors, away from buildings and trees, and wait a few minutes.
	Radome covered	Remove snow, mud or objects from the antenna.
LED steady, but no data on the display	Wrong input selected on the display	Check the GNSS input / speed source setting (section 5.3).
	Third-party display	Set the serial port to 57 600 baud, 8N1, NMEA 0183.
Position jumps or drifts	Obstructions / reflections	Check the positioning rules in section 4.1; move other antennas and metal parts away.
	Interference	See section 2.3; route the harness away from high-current cables.
Sections switch too early / too late	Wrong antenna geometry	Re-measure distance A and check that the antenna is on the center line.
Speed shown is wrong	Wrong speed source	Select <i>Only GPS</i> or <i>Wheel + GPS</i> in Rate Control Settings.



If the problem persists, contact your Tim dealer or write to info@timdigitize.com with the product code (KYP036), the computer model and a description of the problem.

7. Package Contents

Sr. #	Item Code	Description	
1	KYP036	CROSS 200 Smart GNSS antenna	
2	KYP054	Smart GNSS harness, 3 m M12 4-pin → GX12 4-pin	

CROSS 200 is also supplied as part of the NOVA 2N sprayer kits. The Cross 300 Smart Antenna (KYP067) is available as an RTK upgrade.

8. Disposal of Used Product & Packaging



This symbol on the product or its packaging indicates that the product must not be treated as household waste. Hand it over to an applicable collection point for the recycling of electrical and electronic equipment, or return it to your dealer when buying an equivalent new product. Correct disposal helps prevent potential negative consequences for the environment and human health. Dispose of the packaging in accordance with the regulations of the country of use.

9. Warranty

Every Tim product is covered by a **2-year warranty** from the date of purchase. The warranty does not cover damage caused by improper installation or use, use of harnesses or accessories not supplied by Tim, opening of the housing, accidents, or failure to observe this manual. For warranty claims contact your Tim dealer.

Changes to the text, design and technical specifications may occur without prior notice; we reserve the right to make these changes.



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