# AGRINOVO-CT-100

Split-Core RS485 Current Sensor

### Features

- Split core clips onto a live conductor
- No wiring interruption, no downtime
- RS485 Modbus-RTU digital output
- Multi-point calibrated at production
- 0.01 A resolution, 0.2 to 100 A range
- 5-24 V DC supply, 0.5 W
- Shares one bus with other Agrinovo probes
- Connects directly to Genesis controllers

### Applications

- Irrigation and transfer pump run verification
- Aerator, blower, and paddlewheel monitoring in aquaculture
- Ventilation and feed-line motors in poultry and livestock houses
- Compressor, chiller, and cold room equipment
- Motor load trending and dry-run detection
- Equipment runtime and utilisation records

**AGRINOVO-CT-100**
Snap-fit split core

## 1. Description

The AGRINOVO-CT-100 measures AC current on a live conductor and reports it digitally over RS485 Modbus-RTU. The core opens, clips around an existing cable, and closes again, so a motor, pump, or feeder line is instrumented without cutting a wire, breaking the circuit, or taking the equipment out of service.

A 32-bit MCU and a dedicated metering front end do the conversion inside the sensor, and each unit is calibrated across its range at production. The controller receives a finished current value, not a raw analog signal, so there is no analog input to scale, no voltage drop over the cable run, and no drift introduced between the sensor and the controller.

The sensor shares the RS485 bus with every other Agrinovo digital probe. It connects directly to a Genesis controller alongside water quality, soil, and level sensors on the same two data wires, which is how a single controller covers both what a process measures and whether the equipment running it is actually running.

## 2. Specifications

| Parameter | Specification |
|---|---|
| **Measuring Range** | AC 0.2-100 A |
| **Resolution** | 0.01 A |
| **Line Frequency** | 50-60 Hz |
| **Core Type** | Split core, clamp-on |
| **Output** | RS485, Modbus-RTU |
| **Supply Voltage** | 5-24 V DC |
| **Power Consumption** | 0.5 W |
| **Cable** | 4-wire, 1 m standard |
| **Housing Material** | ABS |
| **Mounting** | Snap-fit split core |
| **Operating Temperature** | -20 to 70°C |
| **Storage Temperature** | -20 to 80°C |

Extended measuring ranges are available to order. Contact Agrinovo with the line rating before ordering.

## 3. Installation

The sensor clamps around **one** conductor of the circuit being measured. Clamping around two or more conductors of the same circuit cancels the field and reads close to zero.

1. Press the catch and open the split core.
2. Place the core around a single insulated conductor, live or neutral, of the load to be measured.
3. Close the core until the catch clicks. The two faces must meet flush; a gap reduces the reading.
4. Route the signal cable away from the power conductor and back to the controller.

**Note:** The core clamps onto insulated cable only. Work inside a panel or on a live circuit must be carried out by qualified personnel under the applicable local electrical regulations.

## 4. Wiring

| Wire Color | Function | Description |
|---|---|---|
| **Red** | V+ | Power supply (5-24 V DC) |
| **Black** | GND | Power ground |
| **Yellow** | RS485-A | Data+ |
| **White** | RS485-B | Data- |

Do not swap the A and B data lines. On long runs or buses carrying many devices, power the sensors locally and fit a 120 Ω termination resistor at the far end of the bus. Keep the signal cable out of the same conduit as motor power cables where possible, and cross power runs at right angles rather than running parallel to them.

## 5. Communication Settings

| Parameter | Value |
|---|---|
| **Protocol** | Modbus-RTU |
| **Baud Rate** | 9600 bps (default), 300 to 115200 selectable |
| **Data Bits** | 8 |
| **Parity** | None |
| **Stop Bits** | 1 |
| **Error Check** | CRC-16 |
| **Default Address** | 0x01 |

Function code 0x03 reads registers, function code 0x06 writes a single register. Several sensors share one RS485 bus, each with its own address.

## 6. Register Map

**Measurement Registers (Function 0x03)**

| Address | Description | Scaling |
|---|---|---|
| 0x0001 | Current, high word | 32-bit value, high 16 bits |
| 0x0002 | Current, low word | 32-bit value, low 16 bits |

Registers 0x0001 and 0x0002 are read together as one 32-bit unsigned value, high word first. Current in amps is that value ÷ 100.

**Configuration Registers (Function 0x03 read / 0x06 write)**

| Address | Description | Values |
|---|---|---|
| 0x0000 | Device address | 1-254, default 1 |
| 0x0004 | Baud rate code | See table below, default 0x05 (9600) |

**Baud Rate Codes**

| Code | Baud | Code | Baud |
|---|---|---|---|
| 0x00 | 300 | 0x06 | 19200 |
| 0x01 | 600 | 0x07 | 38400 |
| 0x02 | 1200 | 0x08 | 43000 |
| 0x03 | 2400 | 0x09 | 56000 |
| 0x04 | 4800 | 0x0A | 57600 |
| 0x05 | 9600 (default) | 0x0B | 115200 |

A code outside this list is rejected. The sensor replies with the current register value and the baud rate is left unchanged.

## 7. Reading Data

Read the current value (2 registers from 0x0001):

```
Request:  01 03 00 01 00 02 95 CB
Response: 01 03 04 00 00 27 10 E0 0F
```

**Decoding:**

| Value | Hex | Decimal | Scaling | Result |
|---|---|---|---|---|
| Current | 0x00002710 | 10000 | ÷100 | **100.00 A** |

The four data bytes form the value most significant byte first: 0x00, 0x00, 0x27, 0x10 gives 0x00002710, which is 10000, which is 100.00 A.

## 8. Configuration

**Change Address (0x01 → 0x02)**

Write the new address to register 0x0000:

```
Request:  01 06 00 00 00 02 08 0B
Response: 01 06 00 00 00 01 48 0A
```

**Note:** The sensor answers on its old address and carries the old address in the reply. The new address takes effect once that reply has been sent, so the next request must use address 0x02.

**Change Baud Rate**

Write the baud rate code to register 0x0004. To set 1200 baud (code 0x02):

```
01 06 00 04 00 02 49 CA
```

To return to the 9600 default (code 0x05):

```
01 06 00 04 00 05 08 08
```

**Note:** A new baud rate takes effect after the sensor is power cycled. Change the address before changing the baud rate when commissioning several sensors on one bus.

## 9. Operating Notes

**Placement**

- One conductor only inside the core
- Close the core fully until it clicks
- Keep the split faces clean and free of grit
- Mount so the cable is not under tension

**Commissioning**

- Set a unique address per sensor on the bus
- Confirm a known load before trusting trends
- Currents below 0.2 A are outside the range
- Check A/B wiring and termination on comms faults

## 10. Ordering Information

| Part number | Description |
|---|---|
| AGRINOVO-CT-100 | Split-Core RS485 Current Sensor |

## 11. Revision History

| Rev | Date | Changes |
|---|---|---|
| 1.0 | September 2026 | Initial release |

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