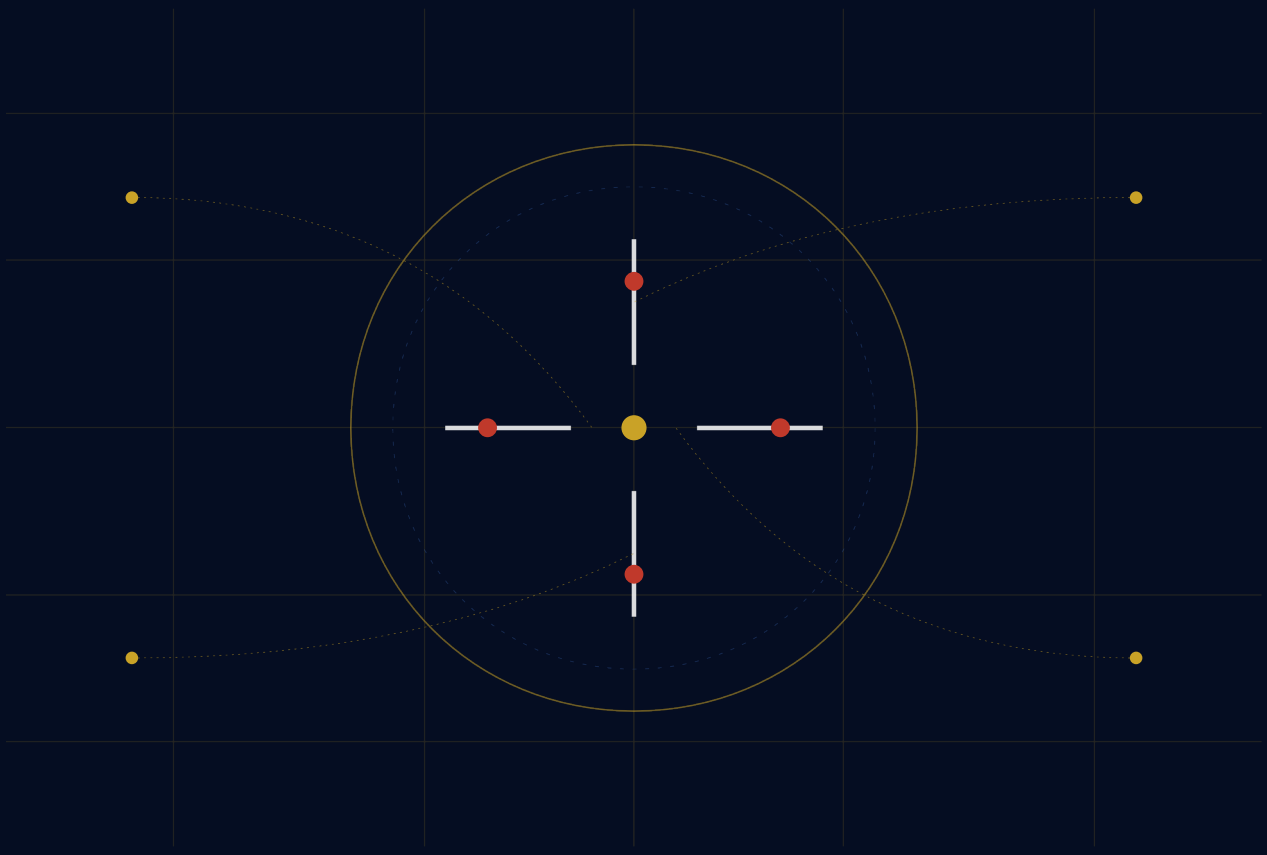
SINYAL
Smart Traffic Systems



SMART INTERSECTION CONTROLLER · 2026

Antra.

Cities flow,
we guide them.

TECHNICAL BROCHURE

EDITION 2026

EN 50556 · NTCIP 1202 · NTCIP 1201

01 THE PLATFORM
At a Glance

The Antra G-Series is a fully programmable, NTCIP-compliant intersection control device, designed and manufactured by Sinyalizasyon Elektronik. A single modular hardware platform spans applications from a simple pedestrian crossing to a metropolitan-scale junction.

Every G-Series controller shares the same firmware, the same independent malfunction management unit, and the same direct-NTCIP central management integration. The platform is built on three principles defence-in-depth safety, open-by-default communication, and field-replaceable modular hardware that together make Antra an unusually long-lived investment for a public-infrastructure asset.

32	1202 v03	EN 50556
SIGNAL GROUP OUTPUTS	NTCIP CONFORMANCE	SAFETY STANDARD
MMU	5 yr	IP66
INDEPENDENT SAFETY UNIT	STANDARD WARRANTY	OUTDOOR CABINET RATING

WHY ANTRA

Antra is engineered for cities that need long-lived, vendor-neutral traffic infrastructure. A hardware MMU that operates independently of the main processor; native NTCIP and SNMPv3 with no proprietary protocols; modular cards replaceable in the field —together these mean less risk, lower lifetime cost, and a wider integration surface than conventional controllers.

INSIDE THE CONTROLLER

02 System Architecture

Antra is composed of independently replaceable cards on a shared backplane. This separation of concerns —processing, safety, switching, detection, power keeps each subsystem testable and service able on its own, and means a single card failure never requires replacing the controller.

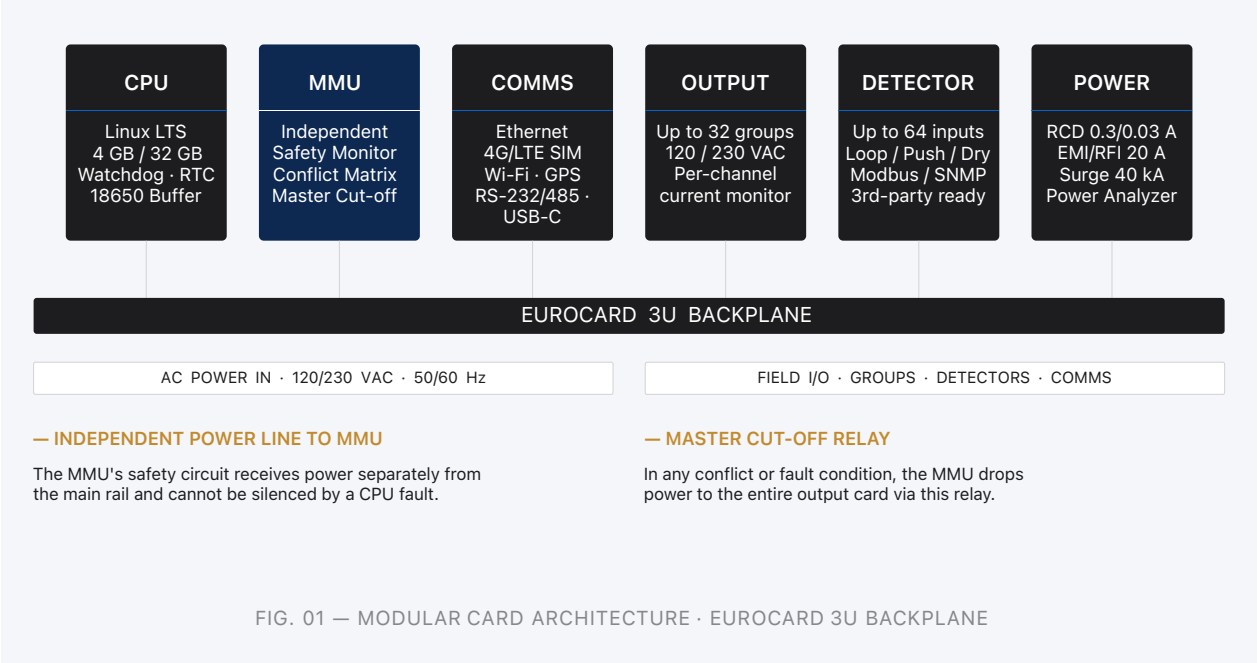


FIG. 01 — MODULAR CARD ARCHITECTURE · EUROCARD 3U BACKPLANE

CPU · MMU

Defence in depth

The CPU runs the controller program; the MMU runs the safety logic. Each on its own power line, its own clock. A software lock-up on the CPU cannot bypass the MMU's conflict matrix.

FIELD-REPLACEABLE

Modular by design

Output, detector, communication and power cards are independently replaceable in the field. A failure on one card never requires replacing the controller —and never invalidates the configuration.

EN 50556 · EN 12675

03 Safety by Design

Antra's safety architecture is built around an independent Malfunction Management Unit (MMU) that operates entirely separately from the main CPU. The MMU has its own power supply line, its own reset mechanism, and its own clock — it cannot be silenced by a software fault on the CPU.

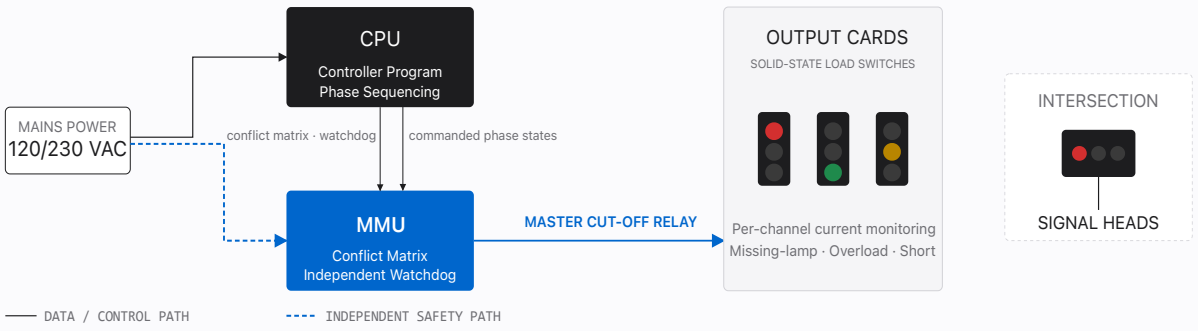


FIG. 02 — MMU INDEPENDENT SAFETY ARCHITECTURE

Faults Detected and Reported

- Mains voltage and frequency excursions
- DC supply voltage anomalies
- Group output over- or under-current (missing lamp / overload)
- Short circuit and open circuit
- Fuse failure
- Load-switch (output element) failure
- Card failure (output / detector / power)
- Conflict violations (G-G, G-Y, Y-Clearance)
- Loop detector failed/healthy status
- Cabinet door open · power lost/restored · red-lamp violations

REPORTED THROUGH NTCIP

Every fault event is logged locally and reported to central management software via the standard NTCIP 1202 blockEventLog object meaning fault information is available in any NTCIP-compliant management platform, not only ROTA.

ONE PLATFORM, EIGHT CONFIGURATIONS

04 The G-Series

All Antra controllers are built on a single hardware and firmware platform. The G-Series designation reflects the number of independent signal group outputs the controller can drive — that is, the number of physical signal heads or signal-head clusters that can be operated simultaneously and independently. Intermediate capacities and project-specific cabinet sizes are also available on request.

NOTE ON TERMINOLOGY

A signal group output is the physical output that drives a signal head. A phase is a timed block during which one or more compatible signal groups are activated together — for example, one through-and-right phase may drive a main signal head plus two repeater heads, three group outputs commanded by a single phase. Phase capacity in software is significantly higher than the group-output capacity.

MODEL	GROUP OUTPUTS	VEHICLE PHASES	PEDESTRIAN PHASES	TYPICAL APPLICATION
Antra-G4	4	2	2	Pedestrian crossings, simple junctions
Antra-G8	8	4	4	3-arm T-junctions, medium-capacity sites
Antra-G12	12	6	6	Central-island T-junctions
Antra-G16	16	8	8	4-arm intersections (expandable)
Antra-G20	20	12	8	Large 4-arm intersections
Antra-G24	24	16	8	Central-island 4-arm intersections
Antra-G28	28	16	8	Central-island 4-arm with early-exit (+8 flash)
Antra-G32	32	16	8	Pedestrian-protected metropolitan junctions (+8 flash, +4 single modules)

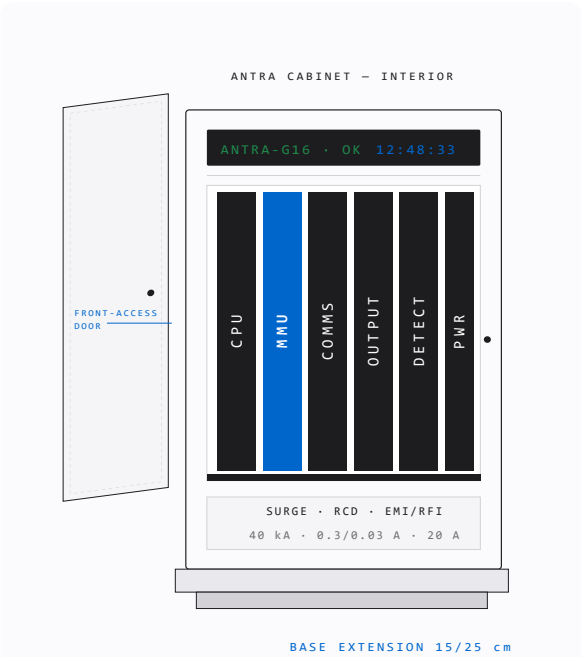
Optional modules — across all G-Series models

- Communication card with SIM support (4G/LTE)
- Detector card (full / semi traffic-actuated operation)
- Pedestrian push-button application
- Police control function module
- Camera, loop detector and radar based, vehicle counting and adaptive signalling
- Camera-based pedestrian detection (push-button alternative)
- Ambulance / emergency priority module
- Countdown and arrow add-on modules

05 DESIGNED FOR THE STREET
Cabinet & Field Layout

The Antra cabinet is a 2 mm galvanized-steel enclosure with conformal-coated electronics, IP65 ingress protection, internal fan and heater for climate adaptation, and a door-open sensor reported as an alarm event over NTCIP.

The cabinet provides 1 mains and 1 UPS-fed user socket, a grounding busbar, and base extensions of 15 cm and 25 cm for cable management. All cards are accessed from the front; the rack layout follows a standard Eurocard 3U form factor.



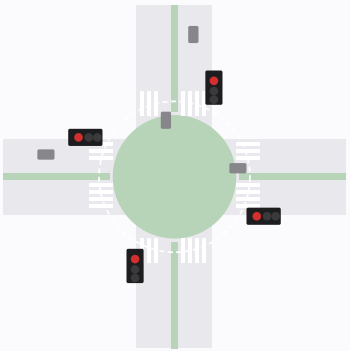
Power and protection

- 120 / 230 VAC Input · 45 / 65 Hz field-configurable
- Surge Arrester: 40 kA
- EMI/RFI Filter: 20 A
- Device RCD 0.3 A · Personnel RCD 0.03 A
- Built-in Single-Phase Electricity Meter (Optional)
- Operating Temperature: –40 °C to +70 °C
- Cabinet Protection: IP66 (IEC 60529)
- Locking System: 4-point locking with double-insert handle
- Electrical Protection: Class II insulation
- Storage Temperature: -40°C to +80°C
- Fire Resistance: 960°C (IEC 62208)
- NEMA Rating: NEMA 13 / NEMA 4X
- CE Compliance: Yes
- Warranty: 5 years

WHERE ANTRA SITS

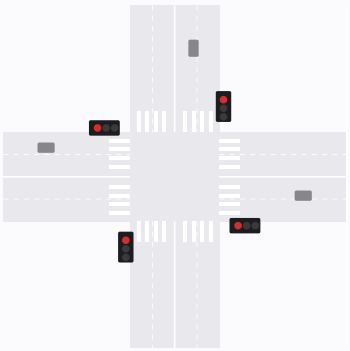
06 Field Layouts

Three reference geometries pedestrian crossing, four-arm intersection, and signalised roundabout that account for the majority of urban deployments. The G-Series capacity scales naturally with intersection complexity.



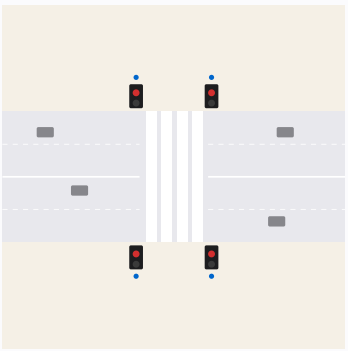
Roundabout

ANTRA-G16 / G20



4-arm Intersection

ANTRA-G16 / G20 / G24



Pedestrian Crossing

ANTRA-G4

NTCIP-NATIVE, SNMPV3-SECURED

07 Communication

Every Antra controller communicates directly with central management software through the standard NTCIP stack — without intermediate gateways or proprietary protocols. This is the foundation of vendor-neutrality at the network level.

NTCIP Conformance

STANDARD	CONFORMANCE
NTCIP 1103	SNMPv1 · SNMPv2c · SNMPv3 (USM, VACM)
NTCIP 1201	Global Object Definitions
NTCIP 1202	Actuated Signal Controller — v03.19 and v04 conformance
ISO 26048-1	NTCIP 1201 v04 Scheduling Table architecture
SCOOT®	UG405:2008 · Full UTC MIB (UM/008)

CYBERSECURITY

SNMPv3 with USM authentication and VACM access control. Role-based user accounts, signed firmware updates, full audit trail of operator actions, and a 10-year window for retroactive security patches.

Network and Physical Interfaces

- Ethernet 100 Mbit/s with VLAN segmentation
- 4G/LTE modem with SIM (primary/failover)
- Wi-Fi for service access
- USB Type-C for local configuration
- RS-232 / RS-485 serial interfaces
- GPS time synchronization, NTP support
- Integrated web interface for service & diagnostics
- 3rd-party devices: NTCIP, SNMP, Modbus RTU/TCP

08 FROM A SINGLE INTERSECTION TO THE NETWORK
Operations & ROTA

Operating Modes

01

Fixed-time

Time-of-day plan switching with calendar overrides; suitable for stable patterns.

02

Vehicle-actuated

Loop, radar, video or push-button detection. Phase extension and gap-out logic.

03

Coordinated

Corridor-level offset, cycle and split synchronization. Green-wave applications via ROTA.

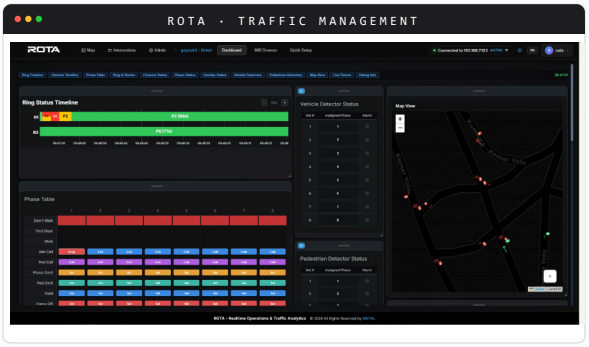
04

Adaptive

GPS-synchronized real-time plan adjustment based on detected demand.

Central Management with ROTA

Every Antra controller is natively compatible with ROTA, Sinyal's centralized traffic management platform. Integration is direct no middleware, no protocol translation. ROTA is also vendor-neutral and manages any third-party signal controller exposing a standard NTCIP MIB.



- Real-time monitoring of phase states, detector data and faults across the entire network
- Built-in MIB browser for direct NTCIP parameter inspection across vendors
- Coordination, split-failure and timing-performance analysis at corridor level

REFERENCE PARAMETERS

09 Technical Specifications

CATEGORY	PARAMETER	SPECIFICATION
Capacity	Signal group outputs	8 to 32, expandable
	Detector inputs / push-buttons	Up to 64 detector + 8 dedicated push-button inputs
CPU	Architecture & memory	Linux LTS, industrial-grade · 4 GB RAM · 32 GB persistent storage
	Power-loss buffer	18650 Li-ion with BMS · hardware watchdog · RTC with battery backup
Safety	Conflict monitor	Independent MMU · EN 50556 / EN 12675 compliant
	Fault classes detected	Voltage, frequency, current, lamp, conflict, communication, cabinet
Electrical	Input voltage	120 VAC (+15%, –20%) / 35 A · 230 VAC variant available
	Operating frequency	50 / 60 Hz field-configurable (±2%)
	DC supply	5 V / 24 V DC
	Surge & EMI	40 kA surge arrester · 20 A EMI/RFI filter
	Residual current devices	0.3 A (device) · 0.03 A (personnel)
Communication	Network	Ethernet 100 Mbit/s · 4G/LTE SIM · Wi-Fi · GPS
	Serial / local	RS-232 · RS-485 · USB Type-C
	SCOOT®	UG405:2008 · Full UTC MIB (UM/008)
	NTCIP	1101 · 1103 · 1201 · 1202 v03.19 + v04 · 2301 · ISO 26048-1
	SNMP	v1 / v2c / v3 (USM, VACM)
Mechanical	Body & ingress	2 mm galvanized steel or powder-coated Glass-fibre-reinforced polyester (GRP) cabinet
	Climate control	Internal fan and heater · door-open sensor
Environmental	Operating temperature	–40 °C to +70 °C
	Relative humidity	Up to 99%, non-condensing
Server	Network Services	Telnet · SCP/SSH · FTP · DHCP · NTP · Proxy · OSPF · OpenVPN
	Remote Management	Secure Web Server over TCP/IP · Remote Software Updates from Traffic Control Centre

10 BUILT TO BE TRUSTED, SUPPORTED TO LAST
Quality & Compliance

Certifications and Standards

Antra is certified to the European framework for road traffic signal systems and is independently tested for electromagnetic compatibility, ingress protection, and quality management.



Warranty, Support and Training

5 years	10 years	3
STANDARD WARRANTY	SECURITY PATCHES	TRAINING LANGUAGES

Five-year manufacturer warranty on the controller, with extended coverage available for selected components. Retroactive security patches and firmware updates available for at least ten years from delivery. Recommended spare-parts kits, on-site commissioning support, and operator and engineer training programmes — in English, Spanish or Turkish.



Smart. Local. Standard.

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