EN-SERIES IO MODULE

EN-16DI

The EN-16DI is a DIN-rail mounted extension IO module with 16 digital inputs, dedicated to status monitoring. It communicates over Modbus RTU on RS485, so it works as an expansion module for the EN-CPU-V7 controller or with any third-party Modbus master.

Inputs are arranged in two groups of eight, each with its own GND and +24V DC terminals, and read volt-free status contacts from AHUs, chillers, FCUs, exhaust fans, pumps and filters.

Modbus RTU | RS485 | 16 DI

16 DI	2 × 8	Modbus RTU	24 V	CE · RoHS
Volt-free contact inputs	Input terminal groups	RS485 slave	DC supply	Certified

FEATURES & BENEFITS

- 16 digital inputs for volt-free status contacts
- Two 8-input terminal groups, each with GND and +24V DC
- High input density for status-heavy panels
- Modbus RTU slave on RS485 (B, A, GND)
- Works with EN-CPU-V7 or any third-party Modbus master
- No configuration required — ready to poll from the master
- Customer-specific IO configuration available on request
- Failed modules are replaced on site without re-programming
- Modular design for fast, repeatable panel builds

APPLICATIONS

AHU & Chiller Status
Volt-free run, trip and auto / manual status

FCU Monitoring
Electrical status of fan coil units

Fans & Pumps
Exhaust fan and pump electrical status

Filter & Alarms
Filter status and alarm contacts

Typical sectors: Commercial buildings · IT parks · Pharmaceutical · Healthcare · Data centres · Industrial

TECHNICAL DATA

INPUTS & OUTPUTS	
Digital inputs	16, volt-free contact
Input groups	2 × 8 (DI1–DI8, DI9–DI16)
Group terminals	GND and +24V DC per group

COMMUNICATION	
Protocol	Modbus RTU (slave)
Interface	RS485 — B, A, GND
Baud rate	Multiple baud rate options
Compatible masters	EN-CPU-V7, third-party Modbus masters

CONFIGURATION	
Set-up	No configuration required
Custom IO	Customer-specific configuration on request
Commissioning	Modbus master utility (e.g. Modscan) via USB-to-RS485, or EN-CPU-V7 over IP

POWER	
Supply voltage	24 V DC
Power consumption	To be confirmed

OPERATING ENVIRONMENT	
Operating temperature	0 °C to 50 °C
Operating humidity	0–95 % RH

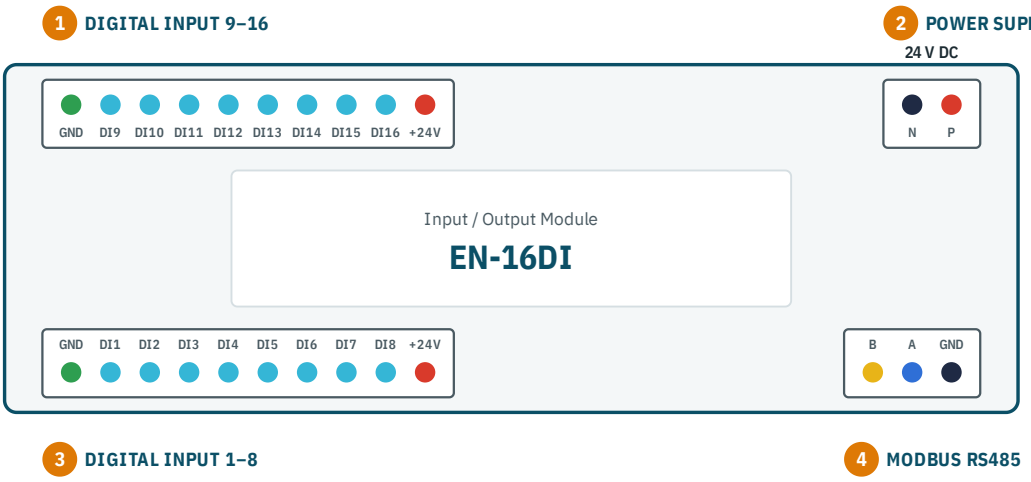
MECHANICAL	
Dimensions (L × W × H)	110 × 110 × 70 mm
Mounting	DIN rail
Enclosure	ABS

STANDARDS & CERTIFICATIONS	
Certifications	CE, RoHS

ORDERING INFORMATION

PART NUMBER	DESCRIPTION
EN-16DI	EN-series IO module — 16 DI (volt-free), Modbus RTU RS485, 24 V DC, DIN rail
EN-CPU-V7	SmartNova DDC Controller — Modbus master for EN-series IO modules (ordered separately)

TERMINALS & WIRING



Terminal layout as viewed from the front of the module.

NO.	GROUP	TERMINALS	SIGNAL	DESCRIPTION
1	**Digital inputs**	**GND, DI9–DI16, +24V DC**	Volt-free contact	Status inputs 9–16; connect each contact between +24V DC and its DI terminal
2	**Power supply**	**N, P**	24 V DC	Module supply input — P: +24 V, N: −24 V (0 V)
3	**Digital inputs**	**GND, DI1–DI8, +24V DC**	Volt-free contact	Status inputs 1–8; connect each contact between +24V DC and its DI terminal
4	**Modbus RS485**	**B, A, GND**	Modbus RTU	Connection to an EN-CPU-V7 RS485 port or third-party Modbus master

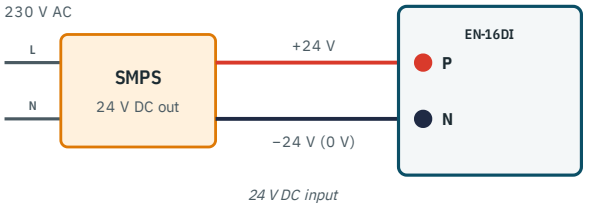
IO WIRING

- Digital inputs accept volt-free (dry) contacts only — do not apply external voltage.
- Connect each contact between the +24V DC terminal and its DI terminal, using the +24V DC of the same group.
- Use separate cores per contact and keep input cabling away from mains wiring.
- Label field cables DI1–DI16 to match the module terminals.

RS485 BUS WIRING

- Use shielded twisted-pair cable and daisy-chain modules on the bus.
- Connect B, A and GND to the same terminals on the master and every module.
- Fit 120 Ω termination at both ends of long bus segments.
- Segment length up to 1200 m per TIA/EIA-485, reduced at higher baud rates.

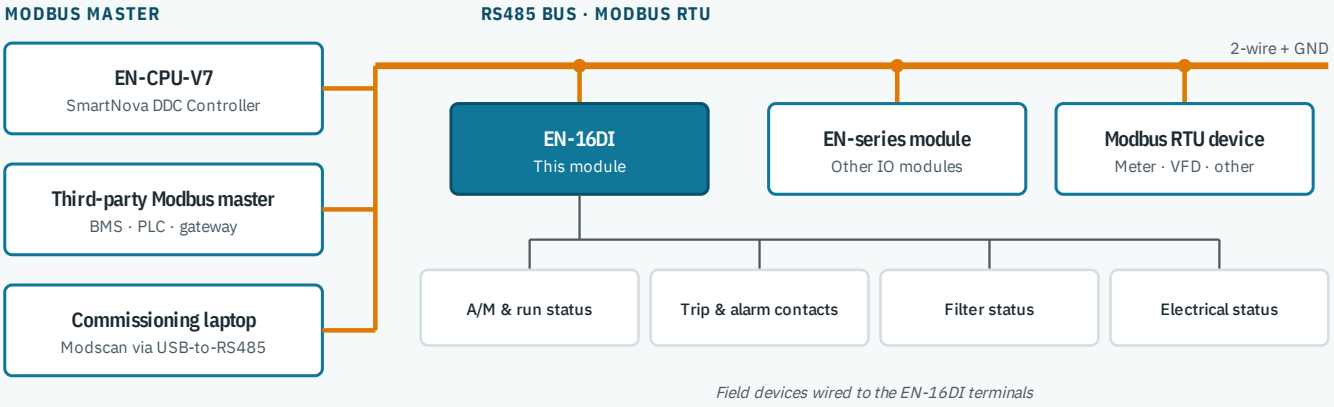
POWER SUPPLY WIRING



24 V DC input

- Supply from a 24 V DC source, such as a 230 V AC to 24 V DC SMPS.
- Connect +24 V to terminal P and −24 V (0 V) to terminal N.
- One SMPS can feed several modules; size it for the total load.

SYSTEM ARCHITECTURE



Field devices wired to the EN-16DI terminals

MODBUS COMMUNICATION

COMMUNICATION SETTINGS

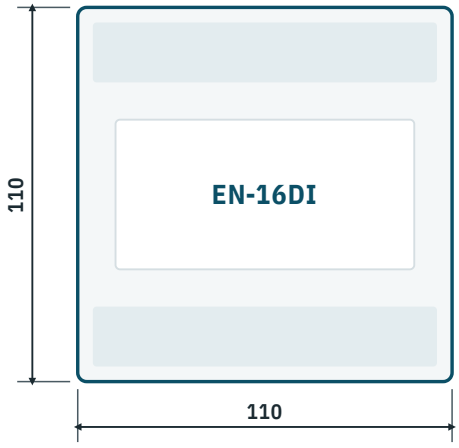
Protocol	Modbus RTU, slave
Physical layer	RS485, 2-wire + GND
Baud rate	Multiple options
Default slave address	To be confirmed
Data format	To be confirmed
Function codes	02

Addresses use the standard Modbus 1x notation, as listed in the module address details.

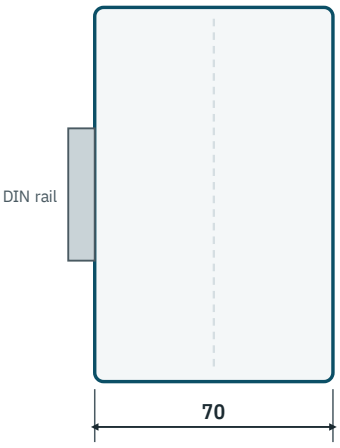
MODBUS REGISTER MAP

NO.	IO POINT	ADDRESS	TYPE	ACCESS
1	DI-1	10001	Input status	R
2	DI-2	10002	Input status	R
3	DI-3	10003	Input status	R
4	DI-4	10004	Input status	R
5	DI-5	10005	Input status	R
6	DI-6	10006	Input status	R
7	DI-7	10007	Input status	R
8	DI-8	10008	Input status	R
9	DI-9	10009	Input status	R
10	DI-10	10010	Input status	R
11	DI-11	10011	Input status	R
12	DI-12	10012	Input status	R
13	DI-13	10013	Input status	R
14	DI-14	10014	Input status	R
15	DI-15	10015	Input status	R
16	DI-16	10016	Input status	R

DIMENSIONS



FRONT VIEW



SIDE VIEW

Overall dimensions

110 × 110 × 70

L × W × H (mm)

Mounting

DIN rail

Enclosure

ABS

All dimensions in mm.
Simplified outline.

INSTALLATION

- Mount on DIN rail inside a control panel or enclosure.
- Leave space around the unit for ventilation and cable access.
- Isolate the power supply before wiring or servicing.
- Route RS485 and digital input cables away from power wiring.
- A failed module can be replaced on site and the system resumes without re-programming.

COMMISSIONING

1. Mount the module and connect the 24 V DC supply.
2. Wire volt-free contacts to DI1–DI16 as per the wiring drawing.
3. Connect RS485 B, A, GND to the EN-CPU-V7 port or Modbus master.
4. Poll the module using the Modbus register map.
5. Verify points with Modscan over USB-to-RS485 or through EN-CPU-V7 over IP.

SYSTEM REQUIREMENTS

- EN-CPU-V7 controller or any third-party Modbus master
- Modbus master utility (e.g. Modscan) for commissioning
- USB-to-RS485 converter for commissioning over serial
- 24 V DC power supply
- DIN rail mounting inside a control panel

SAFETY INFORMATION

- ▲ Installation, wiring and maintenance must be carried out by qualified personnel in line with local electrical regulations.
- ▲ Disconnect all power before connecting or removing terminal wiring.
- ▲ Install inside a closed control panel, protected from dust, water and direct sunlight.
- ▲ Operate only within the supply voltage and environmental limits stated in this datasheet.
- ▲ Observe ESD precautions when handling the unit.
- ▲ Dispose of the product as electronic waste in accordance with local e-waste regulations.

SERVICES & SUPPORT

Technical support	Installation & setup	Maintenance	Application support	Hardware support	Warranty

EnSmart™ Smart way to connect buildings

EnSmart Controls
Erode · Coimbatore · Chennai — Tamil Nadu, India
+91 99410 42612 · www.ensmart.ai

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