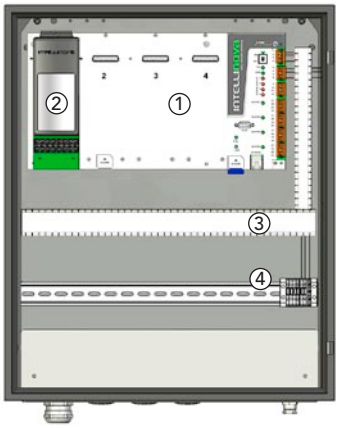
INTELLINOVA®

online condition monitoring

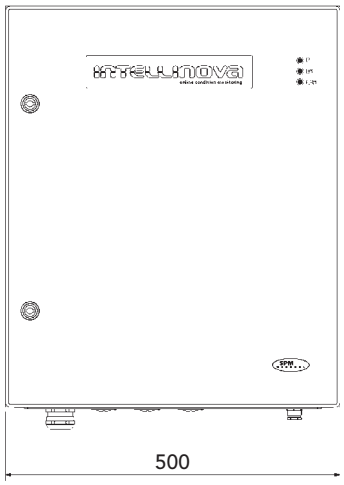
Technical Data Sheets

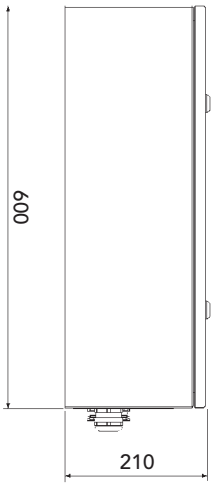
SPM®

Intellinova® – System Unit INS10



1. Commander Unit
2. Monitoring Unit
3. Cable channels
4. DIN rail with terminal blocks





The Intellinova System Unit INS10 is comprised of an industrial enclosure, a Commander Unit, internal cabling and terminals for power supply. Monitoring units are ordered separately. The enclosure, intended for wall mounting, is robust and sealed for use in harsh environments.

The unit has a flange with one cable inlet for eight measuring cables plus two cable inlets for power supply and network connection. It has 3 blind plugs for additional cable inlets (PG29) for up to 32 measuring cables. Holes for cable inlets intended for digital in- and output conections have to be drilled. The DIN rail has terminal blocks and cabling for connection of power supply. Optional terminal blocks, internal cabling and cable inlets are ordered separately. The unit is equipped with plastic cable channels and status LED indicators on the lid.

Technical specifications for the Commander Unit (INC40) are stated on a separate data sheet, TD-271. The various types of monitoring units are described on the data sheets TD-272 to TD-275.

Technical specifications, INS10

Design, enclosure:	enamelled steel, IP66
Power supply:	18 to 36 V DC, nom. 24 V DC
Operating temperature:	0 to +40 °C (32 to 104 °F)
Storage temperature:	-20 to +80 °C (-4 to 176 °F)
Relative humidity:	10% to 90% (non-condensing)
Cable inlets:	1 PG29 for 8 measuring cables
	2 PG11 for power supply and network connection
Terminals:	7 terminal blocks for connection of power supply
Dimensions (w x h x d):	500 x 600 x 210 mm (19.7 x 23.6 x 8.3 inches)
Weight:	21 kg (46 lbs)

System Unit

INS10 Intellinova System Unit (incl. Commander Unit INC40, DIN rail, cable inlets, terminal blocks and internal cabling for power supply

Part numbers

INC40 Commander Unit

INO10 Blind flange

INO11 Power supply unit, 100-240 VAC/24 VDC, 18 W

INO12 Power supply unit, 100-240 VAC/24 VDC, 50 W

INO13 Internal cabling, digital outputs, 4 channels

INO14 Internal cabling, digital inputs, per channel

INO15 Earth bar

INO16 Relay for external alarm

INO18 Enclosure with DIN rail, cable inlets, terminal blocks and internal cabling for power supply

93380 Terminal block 2.5 mm

82435 Cable inlet, PG29, for 8 measuring cables

82095 Cable inlet, PG11, for digital in- and output cables

Monitoring Units

INB80 Bearing Monitoring Unit for SPM transducers of type 40000

INB82 Bearing Monitoring Unit for SPM transducers of type 42000

INV80A Vibration Monitoring Unit, screw terminals

INAI10 Analog Monitoring Unit

INAO80 Analog Output Unit

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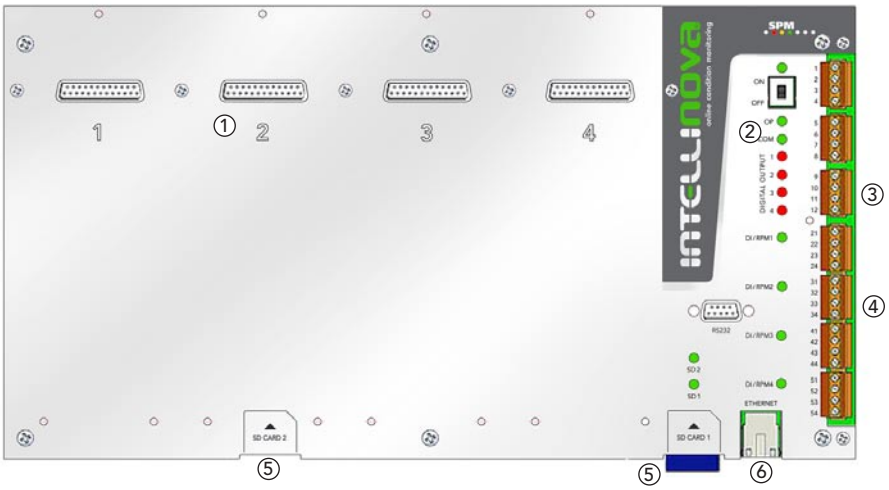
Intellinova® – Commander Unit INC40



1. Sockets for monitoring units
2. Output status indicators
3. Digital outputs
4. Digital inputs
5. SD memory card
6. Ethernet LAN connection

The Intellinova Commander Unit INC40 is a flexible and modular platform which controls and communicates with the monitoring units for continuous monitoring of machine condition. Up to four monitoring units with normally eight channels each can be plugged into the Commander Unit. The Commander Unit is mounted in an industrial enclosure with all necessary equipment ready for use (TD-270). The monitoring units are described on separate technical data sheets (TD-272 to TD-275).

The Commander Unit is equipped with multiplexing measuring logic, alarm, storing and analysis logic. It is connected via standard Ethernet in a LAN network.

The unit has four digital outputs for connection to PLC or via external relays to machine stop, external warning lamp, etc. Up to four RPM transducers can be connected and linked to measuring assignments set up in Condmaster®Nova.

The communication program LinX transmits measuring assignments to and reads the results from the Commander Unit, and controls the measuring operations, data processing and storage. A service laptop with the Field Support Software (FSS) can be connected for service and setup via an Ethernet port. Data access to process and control systems can be implemented via OPC client/server technology. The unit can be used off-line and is equipped with SD memory card for buffering and back-up.

The measuring assignments are set up in Condmaster®Nova running under Windows. Condmaster also handles portable SPM dataloggers and existing SPM online systems. SQL Server is used as database handler.

Technical data

Monitoring units:	sockets for 4 monitoring units
Digital/RPM inputs:	4 channels
RPM transducer type:	Non-contacting displacement sensors, proximity switches, supply 12 V DC
RPM measuring range:	10 – 120 000 rpm
Digital output:	2 status and 4 user configurable
Memory:	SD card, 2 GB
LAN interface:	Ethernet TCP/IP, 10/100 Mbps
Power supply:	18 to 36 V DC, nom. 24 V DC
Operating temperature:	0 to +60 °C (32 to 140 °F)
Storage temperature:	-20 to +80 °C (-4 to 176 °F)
Relative humidity:	10% to 90% (non-condensing)
Dimensions (w x h x d):	390 x 207 x 40 mm (15.4 x 8.2 x 1.5 inches)
Weight:	approx. 750 g without monitoring units

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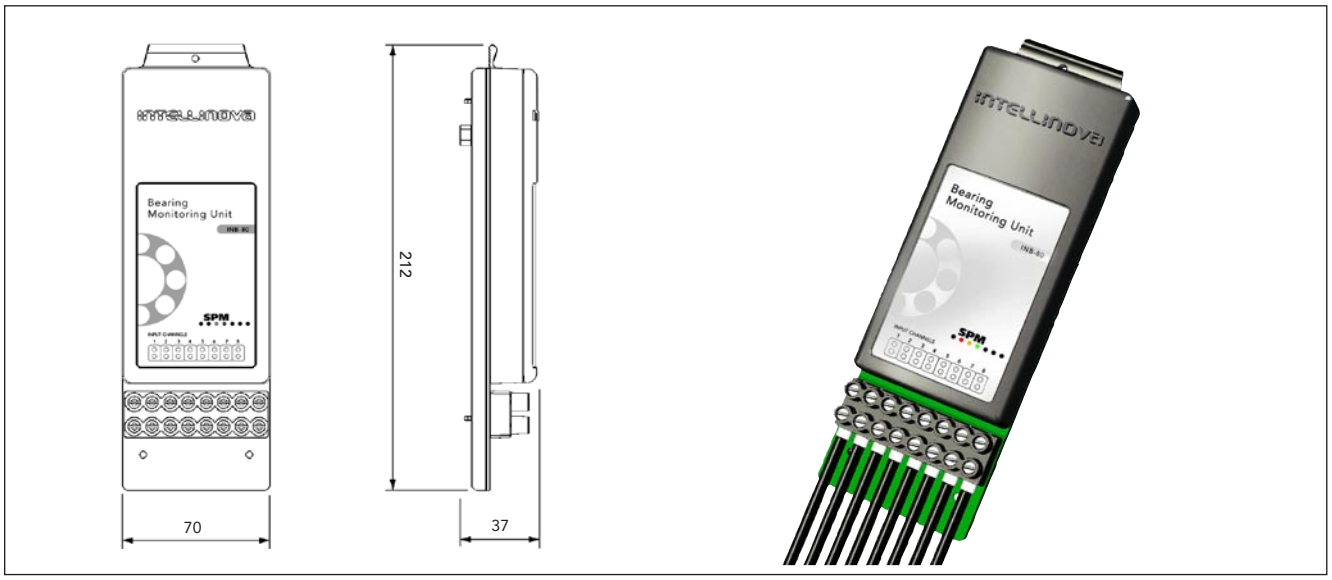
Intellinova® – Bearing Monitoring Unit INB80/82



The Bearing Monitoring Unit is a part of the Intellinova System and has eight channels for continuous monitoring of bearing condition. It measures shock pulses according to the True SPM method and supports SPM Spectrum. The unit is simply plugged into the socket in the Intellinova Commander Unit. Measuring methods, measuring time, alarm limits, alarm delay etc. are set up in Condmaster®Nova.

Two versions of the Bearing Monitoring Unit are available, INB80 intended for shock pulse transducers of type 40000 (cable length max. 4 m) and INB82 intended for shock pulse transducers of type 42000 (cable length max. 100 m).

Signal processing

The resonance frequency of the SPM shock pulse transducer, calibrated to 32 kHz, constitutes the ideal carrier wave for transients caused by shocks. The output of this transducer is the same type of demodulated signal produced by 'enveloping', with this important difference: both frequency and amplitude response of the SPM transducer are precisely tuned, so there is no need to find uncertain and shifting machine resonances to get a signal.

Intellinova measures the shock amplitude by a shock pulse measurement with the dBm/dBc or the LR/HR method and the results are bearing condition data for condition evaluation. The measurement also produces a time record that is subjected to a Fast Fourier Transform (FFT). The resulting spectrum is used mostly for pattern recognition. Spectrum line amplitudes are influenced by too many factors to be reliable condition indicators, so all condition evaluation is based on the dBm or the HR values.

Technical data

Measuring methods:	dBm/dBc, LR/HR, SPM Spectrum
Measuring channels:	8, multiplexing
Measuring range:	-9 to 99 dBsv , -19 to 99 LRHR
Measuring time:	approx. 2 sec. per channel dBm/dBc, approx. 20 sec. LR/HR
Frequency range:	0 to 100, 200, 500, 1000, 2000, 5000, 10 000, 20 000, 40 000 Hz
Number of spectrum lines:	400, 800, 1600, 3200, 6400, 12 800
Measurement windows:	Rectangle, Hanning, Hamming, Flat Top
Spectrum types displayed:	linear, power
Averages:	time synchronous, FFT linear, FFT peak-hold
Frequency units:	Hz, CPM
Saving options for spectrum:	full spectrum, peaks only
Amplitude scale unit:	S_D (Shock Distribution), S_L (Shock Level)
Scaling:	linear or logarithmic X and Y axis
Zoom:	true FFT zoom, visual zoom
Pattern recognition:	bearing frequencies and optional patterns highlighted in the spectrum. Automatic configuration of bearing symptoms linked to ISO bearing no.
Input connectors:	screw terminal for coaxial cables
Transducer line test:	TLT test
Design:	encapsulated circuit board, not protected
Operating temperature:	0 to +60 °C (32 to 140 °F)
Storage temperature:	-20 to +80 °C (-4 to 176 °F)
Relative humidity:	10% to 90% (non-condensing)
Mounting:	plug-in connector and holding screws for attachment in Commander Unit
Dimensions:	212 x 70 x 37 mm
Weight:	approx. 200 g

Part numbers

INB80 Bearing Monitoring Unit for transducers type 40000
INB82 Bearing Monitoring Unit for transducers type 42000

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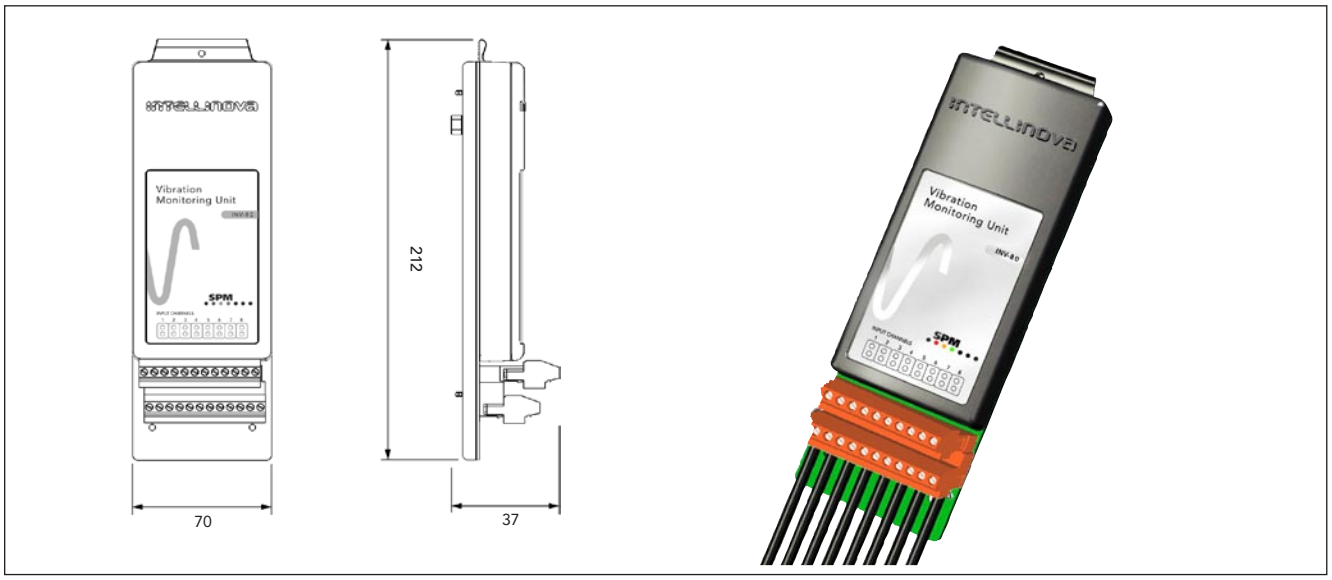
Intellinova® – Vibration Monitoring Unit INV80A



The Vibration Monitoring Unit INV80A is a part of the Intellinova System and has eight channels for continuous monitoring of vibrations. The unit is simply plugged into the socket in the Intellinova Commander Unit. Measuring time, alarm limits, alarm delay etc. are set up in Condmaster®Nova.

It supports broad band vibration measurement, both ISO 2372 and the more recent ISO 10816, the most cost-efficient method for the diagnosis of general machine condition.

It also supports FFT with symptoms and EVAM (Evaluated Vibration Analysis Method). The EVAM method generates condition parameters describing various aspects of machine vibration, vibration spectra where significant line patterns are highlighted and evaluated plus machine specific condition codes and condition values, based on a statistical evaluation of the condition parameters and symptom values.

For each measuring point, the user can make an individual selection and define the type of data best suited for the surveillance of an individual machine.

Two channel simultaneous vibration monitoring requires that either the measuring technique 'FFT with symptoms' or 'EVAM' is active in Condmaster Nova. This type of measurement allows the user to study machine movement in two dimensions by observing the difference of the phase angles measured on the two channels.

Orbit analysis is a vibration measurement function offered with the Vibration Monitoring Unit. The resulting orbit graph shows the movement of the shaft's centerline and is used to detect failures like rubs, unbalance, misalignment or oil whip on machinery with journal bearings. Required are two channel simultaneous vibration measurement and two transducers placed at an angle of 90° to each other, plus a trigger signal from a tachometer probe.

Technical data

Measuring methods:	ISO 2372, ISO10816, FFT with symptom, EVAM, 2-channel vib, orbit
Measuring channels:	8, multiplexing, 2 simultaneous
Design:	encapsulated circuit board, not protected
Input connectors:	screw terminals
Operating temp.:	0 to +60 °C (32 to 140 °F)
Storage temp.:	-20 to +80 °C (-4 to 176 °F)
Relative humidity:	10% to 90% (non-condensing)
Mounting:	plug-in connector and holding screws for attachment in Commander Unit
Dimensions:	212 x 70 x 37 mm
Weight:	approx. 200 g

Vibration analysis

Freq. limit, lower:	0.5, 2, 10 or 100 Hz
Freq. limit, upper:	100, 200, 500, 1000, 2000, 5000, 10000, 20000, 40000 Hz
Envelope HP filters:	100, 200, 500, 1000, 2000, 5000, 10000 Hz
Measurem. windows:	Rectangle, Hanning, Hamming, Flat Top
Averages:	time synch, FFT linear, FFT exponential, FFT peak-hold
Spectrum lines:	400, 800, 1600, 3200, 6400, 12800
Transducer types:	Vibration transducer SLD144 or IEPE (ICP®) type transducers with voltage output

Orbit analysis

Orders:	1 to 5, default 1
Filter types:	None, band pass, low pass
Signal unit:	DISP, VEL, ACC
Measuring time:	1 to 25 revolutions
Transducer types:	Buffered outputs from API670 approved protection systems, alt. transducers SLD144 or IEPE (ICP®) type transducers with voltage output

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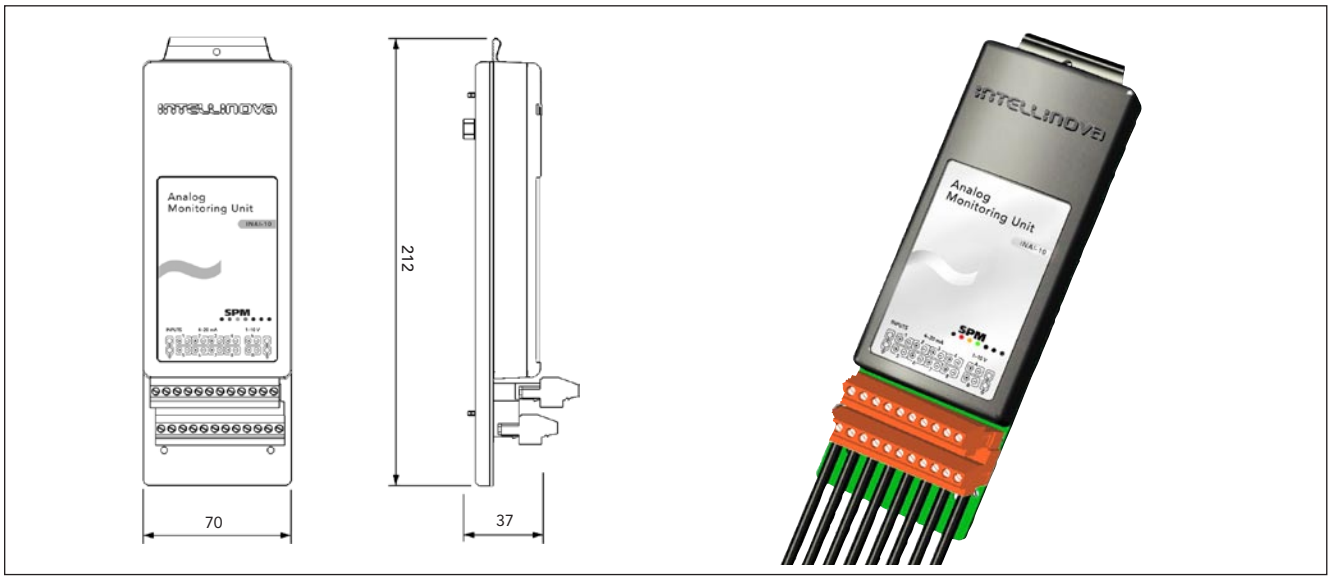
Intellinova® – Analog Monitoring Unit INAI10



The Analog Monitoring Unit INAI10 is a part of the Intellinova System and has ten channels for continuous monitoring of analog signals. It measures 0 to 25 mA on eight channels and 1 to 10 V DC on two channels.

The unit is simply plugged into the socket in the Intellinova Commander Unit. Measuring units, range, quantities, alarm limits etc. are set up in Condmaster®Nova.

Technical data

Current inputs:	8 channels, multiplexing
Voltage inputs:	2 channels, multiplexing
Input resistance:	current 100 Ω, voltage 86 kΩ
Measuring time:	approx. 1 sec. per channel
Measurement range:	0 to 25 mA, 0 to 10 V DC
Resolution:	0.01 mA, 0.01V
Meas. uncertainty:	± (1% +0.1 mA)
Design:	encapsulated circuit board, not protected
Input connectors:	screw terminal
Operating temperature:	0 to +60 °C (32 to 140 °F)
Storage temperature:	-20 to +80 °C (-4 to 176 °F)
Relative humidity:	10% to 90% (non-condensing)
Mounting:	plug-in connector and holding screws for attachment in Commander Unit
Dimensions:	212 x 70 x 37 mm
Weight:	approx. 200 g

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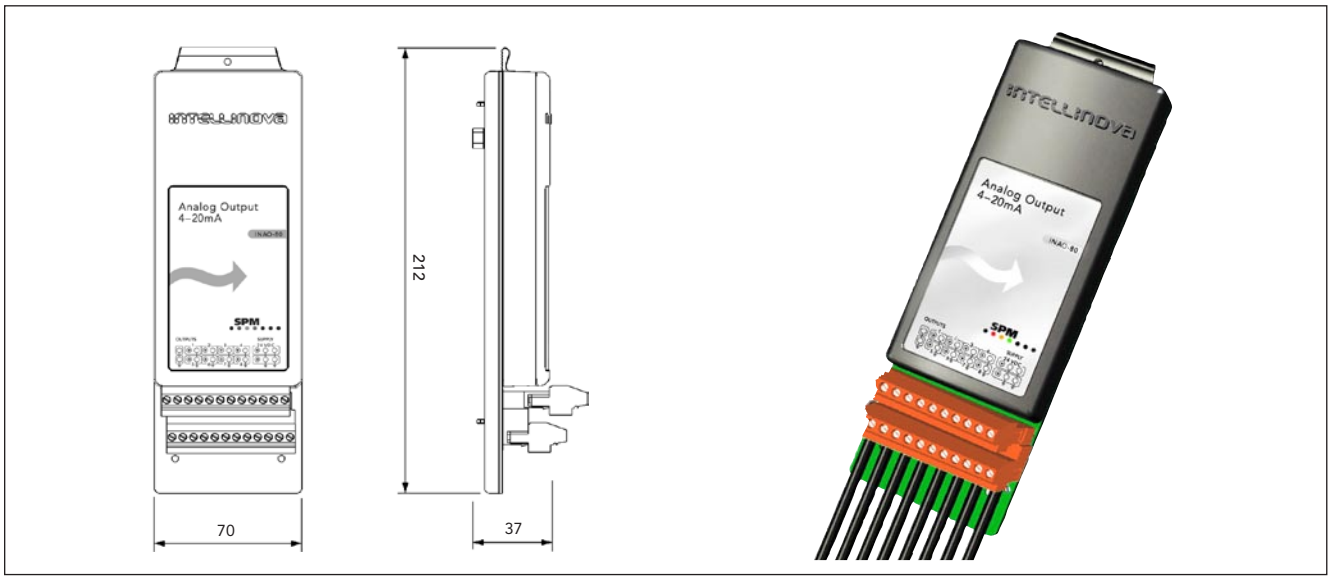
Intellinova® – Analog Output Unit INAO80



The Analog Output Unit INAO80 is a part of the Intellinova System and has eight current outputs. The unit is simply plugged into the socket in the Intellinova Commander Unit.

The unit converts the measuring values from the monitoring units to analog signals 4 – 20 mA for connection to PLC, DCS or other control systems.

Technical data

Analog outputs:	8
Output:	4 to 20 mA
Power supply:	18 to 36 V DC, nom. 24 V DC
Ouput connectors:	screw terminal
Design:	encapsulated circuit board, not protected
Operating temperature:	0 to +60 °C (32 to 140 °F)
Storage temperature:	-20 to +80 °C (-4 to 176 °F)
Relative humidity:	10% to 90% (non-condensing)
Mounting:	plug-in connector and holding screws for attachment in Commander Unit
Dimensions:	212 x 70 x 37 mm
Weight:	approx. 200 g

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