









Control and Beyond

Controllers
Transmitters
Data Loggers
Thermostats
Indicators
Softwares
Sensors





NOVUS
PRODUTOS ELETRÔNICOS LTDA

TEMPERATURE CONTROLLERS

N440

N440 is a very low cost ON/OFF temperature controller with digital display aimed at simple processes that require good accuracy.

- Accepts thermocouples J or K or Pt100 (specify type in the order).
- Sensor offset adjustment.
- Power: 85-250 Vac or 24 Vdc/ac.
- 1 SPDT relay for contol or alarm.
- Hysteresis independent for each output.
- Heat/cool action independent for each output.
- Configurable setpoint limits.
- Configurable °C or °F.
- MIN, MAX and DIFFERENTIAL alarm functions.
- 3½ digit display with 0,1 degree resolution in the range -19.9 to 199.9°C (for Pt100 input only).
- 4-level keypad protection prevents unauthorized parameter changes.
- IP65 front panel with silicone rubber keypad.
- Circuitry can be removed via front panel.
- Dimensions: 48 x 48 x 110 mm.

OPTIONS:

- SPST relay or buzzer for alarm.

N480-D

This user-friendly PID temperature controller incorporates many functions such as mamp & soak setpoint profile, pulse and relay outputs yet keeping the cost low.

- Accepts thermocouples J, K, S, T, E, N, R and Pt100.
- Control output: SPST relay and voltage pulse, both available in the basic model.
- Up to 2 alarm relays (optional).
- Power: 85-250 Vac or 24 Vdc/ac.
- Ramp and soak: one controlled ramp and one timed soak are standard.
- Auto tuning PID.
- Detects any sensor failure.
- Easy-to-set programming menu for non-experienced users.
- IP65 front panel with silicone rubber keypad.
- 4-level keypad protection prevents unauthorized parameter changes.
- Dual 4-digit display.
- Circuitry can be removed via front panel.
- Dimensions: 48 x 48 x 110 mm.

N960

This PID controller is a great substitute for the old analog controllers for holding extreme simplicity in operation and yet featuring the highly accurate performance of digital technolgy. The high efficiency 18 mm upper display can be viewed from far away.

- Accepts J, K, T, N, R, S, and Pt100 RTD.
- Outputs: 2 SPDT relays and logic pulse for driving SSR.
- Up to 2 software configurable alarms.
- Up to 2 time relays (0 to 6500 s).
- Dual display, 18 mm for measured value and 13 mm for setpoint.
- Resolution: 12,000 levels.
- Power: 85-250 Vac.
- Ramp and soak: 1 seven-segment profile.
- Auto tuning PID.
- Enclosure: flame retardant material.
- IP65 (NEMA 4) front panel.
- Dimensions: 96 x 96 x 92 mm.

OPTIONS:

- 24 Vdc/ac power supply.
- 4 to 20 mA control output.

UNIVERSAL CONTROLLERS

N1100

It holds in one single instrument all the main features that are needed for the vast majority of industrial processes.
Both input and output are selected through the front keypad without hardware change.

- Accepts J, K, T, N, R, S, Pt100, 4-20 mA, 50 mV, 0-5 Vdc without any hardware change.
- Outputs: 2 SPST relays, linear 4-20 mA and logic pulse for SSR.
- 2 alarms in the basic version.
- 2 time relays, 0 to 6500 seconds.
- Input resolution: 12,000 levels.
- Power: 85-250 Vac or 24 Vdc/ac.
- PV or SP retransmission in 4 to 20 mA.
- Bumpless Auto/Manual function.
- Remote setpoint input (4 to 20 mA).
- Programmable soft start (0 to 9999 sec.).
- Ramp and soak: 7 seven-segment profiles or one 49-segment profile with events.
- PID auto tuning.
- Easy maintenance by substitution of play in boards.
- IP65 front panel, 48 x 48 x 110 mm size.

OPTIONS:

- Third relay or 2 digital I/O.
- RS-485, MODBUS protocol, 19200 bps.
- Heater break detection.

N2000

Ideal for high performance applications, this instrument has all the features needed for most industrial processes.
Both input and output are selected through the front keypad without hardware change.

- Accepts J, K, T, N, R, S, Pt100, 4-20 mA, 50 mV and 0-5 Vdc.
- Outputs: 2 SPDT and 2 SPST relays, linear 4-20 mA and logic pulse for SSR.
- 4 software configurable alarms.
- Up to 2 time relays (0 to 6500 s).
- Input resolution: 12,000 levels.
- 24 Vdc output for remote transmitters.
- Power: 85-250 Vac or 24 Vdc/ac.
- PV or SP retransmission in 4 a 20 mA.
- Bumpless Auto/Manual function.
- Remote setpoint input (4 to 20 mA).
- Programmable soft start (0 to 9999 sec.)
- Ramp and soak: 7 seven-segment profiles or one 49-segment profile with events. PID auto tuning.
- IP65 front panel, 48 x 96 x 92 mm size.

OPTION:

- RS-485, MODBUS protocol, 19200 bps.

N2000-S

Dedicated to servo-positioning valves and dampers by a linear output or two relays which are time proportionally driven according to the PID output.
Input and output are selected through the front keypad without hardware change.

- Accepts J, K, T, N, R, S, Pt100, 4-20 mA, 50 mV and 0-5 Vdc.
- Dual SPST relay control output and linear 4-20 mA for servo positioning.
- 2 SPDT relays for alarm.
- Input resolution: 12,000 levels.
- 24Vdc output for remote transmitters.
- Power: 85-264 Vac or 24 Vdc/ac.
- PV or SP retransmission in 4 a 20 mA.
- Bumpless Auto/Manual function.
- Feedback potentiometer input.
- Ramp and soak: 7 seven-segment profiles or one 49-segment profile with events.
- PID auto tuning.
- Password protection.
- IP65 front panel, 48 x 96 x 92 mm size.

OPTION:

- RS-485, MODBUS protocol, 19200 bps.

INDICATOR

N480i

This low cost and easy-to-use universal indicator can be easily configured by non-experienced users.
Full rangeability and a 24 Vdc output for remote transmitters are standard. Up to two alarm relays are optional.

- Accepts thermocouples J, K, T, E, N, R, S, Pt100, 50 mV, 10 V and 4-20 mA.
- Programmable range from -1999 to +9999
- Up to 2 relay alarms (optional).
- Alarm functions: LO, HI, differential, diff. HI, differential LO and broken sensor.
- Power: 85-250 Vac or 24 Vdc/ac.
- 24Vdc output excitation for transmitters.
- Detects any sensor failure.
- Easy to use programming menu makes operator interface a snap.
- IP65 front panel with silicone rubber keypad.
- 4-level keypad protection prevents unauthorized parameter changes.
- Circuitry can be removed via front panel.
- Dimensions: 48 x 48 x 110 mm.

N1500

N1500 is a high performance universal indicator and comes in 3 versions: standard, dual input (**N1500D**) and for load cell applications (**N1500LC**).
It features 16-bit input resolution, 4 relays, digital communication, field transmitter or load cell excitation, analog retransmission and digital input.

- Accepts t/c J, K, T, E, N, R, S, B, Pt100, 4-20 mA, 0-50 mV, 0-5 Vdc and 0-10 Vdc.
- Programmable range from -31000 to +31000 with adjustable digital filter.
- Input sampling: up to 15 per second.
- Alarms: two SPDT relays.
- Functions: LO, HI, differential, diff. LO, diff. HI and sensor break.
- HOLD, PEAK, MAX and MIN functions.
- Power: 85-250 Vac.
- 24 Vdc or 10 Vdc supply output.
- Tare & zero, remote or via frontal keypad (**N1500LC**).
- IP65 front panel, 96 x 48 x 92 mm size.

OPTIONS:

- RS485 MODBUS communication.
- Process variable 4-20 mA retransmission.
- 2 relays SPST.
- Power: 24 Vdc/ac

N1500-G

N1500-G is the big version of the **N1500** 1/8 DIN digital panel meter and features bright 56mm digit displays for high visibility at long distances.
It features a digital input with special functions and an optional RS485 comm. Setup can be done via its frontal keypad or remotely from a PC.

- Accepts termocouples J, K, T, E, N, R, S, B, Pt100, 4-20 mA, 0-50 mV and 0-5 Vdc.
- Programmable range from -1999 to +9999 with adjustable filter.
- Alarms: two 3 A SPST relays.
- Functions: LO, HI, differential, diff. LO, diff. HI and sensor break.
- HOLD, PEAK, MAX and MIN function.
- Remote tare/zero or via keyboard.
- 24 Vdc output for remote transmitters.
- Power: 85-250 Vac or 24 Vdc/ac.
- Process variable retransmission.
- RS485 MODBUS digital communication.
- 10 Vdc output for load cells.
- Digital input: hold, tare zero or reset.
- Dimensions: 310 x 110 x 37 mm.

PID CONTROL MODULE

CONTROLRAIL

This advanced auto-adaptative PID controller is ideal for multiple point SCADA systems where high performance is expected.

Configuration can be performed from an operator interface via Modbus RTU protocol.

The auto-adaptative PID tuning finds the best parameters possible while aditional features as auto/manual bumpless transfer, soft-start, antireset windup and advanced alarm function ensure the best performance.

- Acceps t/c types J, K, T, E, N, R, S, B, Pt100 RTD, 0-20 mV, 0-50 mV, 0-5 V, 0-10 V, 0-20 mA and 4-20 mA.
- Accuracy: 0.25% FS ±1°C for t/c or 0.15% FS for Pt100, voltage or current.
- Outputs: 1 SPDT 3 A/250 Vac relay; 1 pulsed voltage 0-10 V to 35 Vdc-50 mA.
- 1000V/1minute isolation from input signal to power or to RS485 bus.
- Power: 10 to 35 Vdc, 50 mA max.
- Auto-adaptative PID with PWM output.
- Control mode: auto / manual and soft-start.
- RS485 Modbus RTU comm to 115Kbps.
- Dimensions: 71x77x19mm. DIN rail mount.

ELECTRONIC COUNTER

NC400

Programmable 4-digit up/down counter with Count, Reset and Hold inputs. It has 2 outputs with independent presets and turn-on times. The input signal can be dry contact, NPN or PNP sensors. A programmable Scale Factor allows configuration of the indicated value according to the pulse ratio of the sensor. Counter Reset and Hold can also be accomplished from the keypad.

- Inputs: Count, Reset and Hold. NPN, PNP or dry contact signals.
- Max. Count frequency: 50 Hz or 20 KHz.
- Counter scale factor: 0.01 to 99.99.
- Counter mode: UP or DOWN.
- F key options: Counter Hold, Couter Reset, Outputs Reset.
- Outputs: 2 SPST relays (3 A/250 Vac) or 1 SPST relay and 1 pulse 5 V/25 mA.
- Outputs response time: 10 ms (relay), 0,3 ms (pulse).
- Power: 85-250 Vac or 24 Vdc/ac.
- Sensor supply output: 12 Vcc/50 mA.
- IP65 front panel, 48 x 48 x 110 mm size.

TIMER

NT240

With a 4 digit display, this timer offers a relay output to be switched at pre-programmed intervals according to eleven different timing functions.

The LED display shows the running time and the digital inputs execute start, hold and reset functions.

- Input types:NPN/PNP, dry contact and voltage pulse. Start, Hold and Reset functions
- Output type: 3 A/250 Vac relay or 5 Vdc/25 mA voltage pulse.
- Programmable time range from 0.01 second to 9999 hours.
- Time Base Accuracy: 0,05%.
- Up and down counting.
- Display: high efficiency 10 mm LED.
- Eleven different timer modes. One mode is user defined.
- Frontal key to execute one pre-programmed special function.
- Power: 85-250 Vac or 24 Vdc/ac.
- Auxiliar supply output: 12 Vcc/50 mA.
- IP65 front panel, 48 x 48 x 110 mm size.

DATA ACQUISITION, RECORDING AND SUPERVISION

LogBox

This self-contained logger accepts several analog industrial sensors and accurately records the measurements in non-volatile memory.
Setup and data retrieval is done in a PC via the **IR-Link3** infrared wand through the use of **LogChart,** a Windows® software which plots and prints graphs, lists loggins and exports data to spreadsheets. Special mathematical functions can be programmed. A PDA using Palm/OS® can be used for configuration and data download through IrDA interface.

- 1 or 2 universal multi-sensor channels.
- Accepts t/c J,K,T,E,N,R,S,B; Pt100,0-50 mV 4-20 mA, 0-5V, 0-10 Vdc or Digital pulse.
- Up to 14 bit resolution (LogBox-AA).
- Accuracy: 0.25% FS ±1°C for t/c or 0.2% FS for other signals.
- Interval pulse counting (LogBox-DA).
- Capacity: 32768 or 65536 measurements.
- Recording rate: from 1s to 18 days/reading.
- Internal real time clock compliant to 2080.
- Powered by internal 3.6 V lithium battery.
- Battery life: 2 years typical.
- Operating temperature -40°C to 75°C.
- IP65 or IP67 enclosure, 70 x 60 x 36 mm.

Penguin

The **Penguin** is a stand alone data logger for recording temperature and relative humidity.

The sensors are built in and the data is stored in local memory from where it can be conveniently transferred to a PC via the infrared **IR-Link3** interface or directly to a Palm PDA for visualization and analysis in the form of tables or graphics.

- Transparent polycarbonate IP65 case.
- Non-contact infrared interface (IR-Link 3).
- Memory capacity: 16 k loggings for Penguin T and 32 k loggings for Penguin RHT.
- Working temperature: -40°C to +80°C.
- Relative humidity: 0 to 100%.
- Accuracy: ±1.5% from 20 to 80% RU and ±1ºC for temperature (@ 25ºC).
- Resolution: 12 bits or 4.096 levels.
- Logging intervals: settable from 1s to 18h.
- Alarm setting: LO / HI.
- Software for Windows® and Palm/OS®.
- Lithium battery: 3.6 V (good for ~5 years).
- Operation status LED indicator.
- Start/stop button.
- Internal real time clock.
- Dimensions: 45 x 60 x 20 mm.

*my*PCLab

***my*PCLab** is a very compact DAQ tool which connects to a PC via a USB port and monitors two universal input analog variables along with one digital input.

From hobbyists to scientists, from simple technical tasks to complex engineering activities, ***my*PCLab** can be an invaluable tool for on-line monitoring and data logging in schools, laboratory research, machine data recording and industrial understanding.

It comes with an intuitive and easy-to-use Windows® software which plots and records data, shows gauges, bargraphs and digital readouts.

- Dual analog inputs for t/c, Pt100, mV, mA, V.
- A/D resolution: 11 to 15 bits.
- Sampling: selectable from 8 to 128/second,depending on sampling rate.
- Accuracy: 0.25% FS ±1°C for thermocouples or 0.2% FS for other signals.
- Digital input: voltage level or dry contact.
- USB V1.1. Virtual Serial Port driver, Modbus RTU protocol.
- Windows® software provides communication to multiple ***my*PCLab** devices.

DATA ACQUISITION, RECORDING AND SUPERVISION

Field Logger

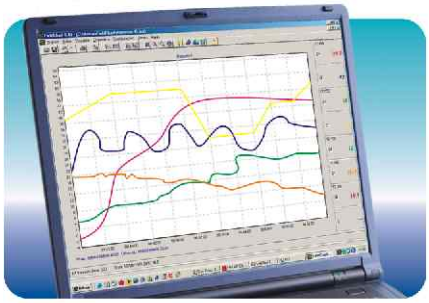
This microprocessor based data acquisition and recorder can handle any analog input and will operate as an RTU linked to a PC for on line recording and supervision or as a stand alone data logger with real time clock and data memory.
DIN rail compatible, it has 8 universal channels that will accept different input sensors at the same time and can be easily expanded.

- 8 universal analog channels per module.
- Accepts t/c J, K, T, E, N, R, S, B; 4-20 mA, Pt100, 0-50 mV without hardware change.
- Input resolution: 13,000 levels.
- Accuracy: 0.25% FS ±1°C for t/c or 0.2% FS for other signals.
- Acquisition rate: from 0.5s to 1 day.
- Power: 85-250 Vac, optional 24 Vdc.
- Alarms: 2 relays 3 A for the 8 channels.
- Digital input for remote START/STOP.
- RS-485, ModbusRTU, 19200 bps.
- 35 mm DIN rail mounting.
- ABS enclosure: 105 x 90 x 60 mm.

OPTION:

- Internal memory (optional) for 128,000 recordings and real time clock.

FieldChart



FIELDCHART is a Windows® 98, 2000 and XP compatible software which performs the communication and data treatment for the **FIELD LOGGER** Virtual Recorder.

This easy-to-use intuitive system does not require previous user training. The practical configurator module performs the setup of the **FIELD LOGGER** parameters and allows the user to check general status.

The main module collects data to the PC, displays the data in both digital and graphic formats in batches or in real time and provides trend and historical views.

It can zoom in and out, superimpose or link graphs in one screen, print graphs or lists and export to spreadsheets or word processors.

FIELDCHART will support up to 8 **FIELD LOGGER** units and the **NOVUS** family of controllers and DPMs simultaneously when connected on line, thus plotting up to 64 analog channels.

HI and LO alarms can be set for each channel and their values will be displayed on the screen whenever an alarm becames active.

Web Server

The **WS10** is targeted at the acquisition and transmission of data. It is capable of integrating instruments and sensors to the Internet and ethernet . The **WS10** comprises an ethernet interface, the TCP/IP protocol, 2 serial communication ports, 2 relay outputs and 4 analog or digital inputs.

As a Modbus RTU Master, **WS10** can set and get information from external devices, and as a ModbusTCP Server or Gateway, can be easily integrated to SCADA systems.

WS10 can serve dynamic HTML pages, send e-mail, monitor alarm conditions and communicate with SCADA software.

- Flash memory for HTML and Data Logging.
- Comm ports: 1 RS232, 1 RS485, Ethernet 10BaseT. Optional: Internal V32 Modem.
- Protocols: TCP/IP, PPP, HTTP, FTP, SMTP, DHCP, DNS, Modbus (TCP and RTU).
- Inputs: 4 digital or analog (0-5 V or 0-20 mA), 10 bits resolution.
- Outputs: 2 Relays. SPST 3 A/250 V.
- Power: 85-250 Vca.
- Enclosure: 105x90x60 mm, DIN rail mount.

RELATIVE HUMIDITY & TEMPERATURE TRANSMITTERS

RHT-WM

The **RHT-WM** series of humidity and temperature transmitters use a unique and sturdy high performance sensor which delivers highly stable and accurate relative humidity and temperature measurements.

The state of art microprocessor based electronic circuit provides dual linear outputs which perform accurate measurement to provide control in the most demanding applications.

- Measures relative humidity from 0 to 100% without condensation.
- Dual 4-20 mA loop powered signals.
- Accuracy: ±1.5% from 20 to 80% RH @ 25°C and ±1°C for temperature.
- Hysteresis: ±1% RH maximum.
- Linearity: <<1% RH.
- Circuit working temperature: -10 to +65°C
- Power supply: 12 to 30 Vdc.
- Nylon probe for sensor protection.
- IP65 protected ABS enclosure.
- Enclosure dimensions: 90 x 60 x 36 mm.

OPTION:

- PC interface for configuration.

RHT-DM

The **RHT-DM** series of humidity and temperature transmitters have the same features of the RHT-WM series but are provided with a flanged probe for easy installation in ducts, chambers and air conditioning systems.

By keeping the circuitry away from the wet environment the probe can then be exposed to harsher conditions and much higher temperatures.

- Measures humidity from 0 to 100% without condensation and temperature from -20 to 100°C (-40 to 120°C for short periods).
- Dual 4-20 mA loop powered signals.
- Accuracy: ±1.5% from 20 to 80% RH @ 25°C and ±1°C for temperature.
- Hysteresis: ±1% RH maximum.
- Linearity: <<1% RH.
- Circuit working temperature: -10 to +65°C.
- Power supply: 12 to 30 Vdc.
- Flanged probe length: 150 mm or 250 mm.
- Nylon probe for sensor protection.
- IP65 protected ABS enclosure.
- Enclosure dimensions: 90 x 60 x 36 mm.

OPTION:

- PC interface for configuration.

RHT-RM

The **RHT-RM** relative humidity and temperature transmitters are produced in an elegant enclosure provided with ventilating slots for fast and efficient measurement when exposed to ambient air.

The transmitter circuit is provided with dual isolated linear outputs and is ideal for transmitting relative humidity and temperature in HVAC applications, clean rooms, computer rooms, offices, hospitals, libraries and any other situation where design and accuracy are relevant.

- RH from 0 to 100% without condensation. Temperature from -10 to 65°C.
- Dual 0-5 or 0-10 V signals.
- Accuracy: ±2% from 0 to 100% RH @ 25°C and ±1°C for temperature.
- Hysteresis: ±1% RH maximum.
- Linearity: <<1% RH.
- Response time: Less than 30 seconds.
- Working temperature: -10 to +65°C
- Power:12 to 30 Vdc
- Elegant enclosure for wall mounting.
- Dimensions: 57 x 57 x 30 mm.

OPTION:

- PC interface for configuration.

I/O MODULES

DigiRail

The **DigiRail** I/O modules provide a simple and inexpensive way for integrating digital and analog signals into PLCs and SCADA systems via RS485 interface with Modbus RTU protocol.

- Two analog inputs (DigiRail-2A), 2 Relays (DigiRail-2R) or 4 counting digital inputs (DigiRail-4C).
- Accepts themocouples type J, K, T, E, N, R, S, B, Pt100 RTD, 0-20 mV, 0-50 mV, 0-5 V, 0-10 V; 0-20 mA, 4-20 mA.
- Sensor break detection for t/c, RTD & mV.
- Analog input resolution: 17 bits.
- User defined linearizton option for the analog inputs.
- Up to 4 digital counters inputs (DigiRail-4C) or 2 SPDT 3 A/250 Vac relays (DigiRail-2R).
- Power: 10 -35 Vdc. Consumption: 50 mA;
- RS485 (2-wire) Modbus RTU comm.
- Accuracy (at 25°C): ±0.15% FS for Pt100, mV, V and mA.
- Isolation: 1000 Vac from digital or analog input to power or comm port.
- Windows software configurator.
- Dimensions: 71 x 77 x 19 mm.

TEMPERATURE TRANSMITTERS

TxBlock & TxIsoBlock

TxBlock and **TxIsoBlock** (isolated) are fully programmable head mount temperature transmitter dedicated to Pt100 and thermocouple sensors. In-the-field configuration of input type and working range can be achieved by means of a cable and an RS232 port from a PC.

- Programmable input: Pt100 RTD and thermocouples type J, K, T, E, N, R, S, B.
- Two-wire loop powered 4-20 mA output.
- Power supply: 10 to 35 Vdc.
- Linearized output and cold junction. compensation for thermocouples.
- 2 or 3-wire Pt100 with linearization.
- TxIsoBlock isolation: 1000 Vac.
- Programmable working range.
- Windows configurator or Palm (optional).
- Manual frontal zero (offset) adjustment.
- Accuracy: ±0.2% full scale for Pt100 and 0.3% max. of FS for thermocouples.
- Temperature effect: 0.003% SPAN/°C.
- Working temperature: -40 to +85°C
- Programmable burnout upscale or downscale sensor failure protection.
- Dimensions: Ø 44 x 25 mm.

TxRail & TxIsoRail

TxRail and **TxIsoRail** (isolated) are fully programmable DIN rail mounting temperature transmitters for Pt100 and thermocouple sensors. Both units can be ordered for 0 to 10 Vdc output in a 3-wire configuration.
The flexibility of in-the-field configuration translates into a one model fits all signal conditioning and isolator module.

- Programmable input: Pt100 RTD and thermocouples type J, K, T, E, N, R, S, B.
- 2-wire loop powered 4-20 mA output.
- Power supply: 10 to 35 Vdc.
- Linearized output and cold junction compensation for thermocouples.
- 2 or 3-wire Pt100 with linearization.
- TxIsoRail isolation: 1000 Vac.
- Programmable range and offset correction.
- Windows configurator or Palm (optional).
- Accuracy: ±0.2% full scale for Pt100 and 0.3% max. of FS for thermocouples.
- Temperature effect: 0.003% SPAN/°C.
- Working temperature: -40 to +85°C
- Programmable burnout upscale or downscale sensor failure protection.
- Dimensions: 71 x 77 x19 mm.

PRESSURE TRANSMITTERS

510

The **510** series of compact pressure transmitters feature a unique stainless steel diaphragm for total media compatibility and are ideally suited for applications in refrigeration and industrial cryogenics, compressors and steam systems.

A quickon connector system substancially reduces cable assembly time.

- Range: -1 to 160 bar in several steps.
- Working temperature: -40 to 85°C.
- Application temperature: -40 to150°C.
- Media contact material: SS 1.4305.
- Process thread: 1/4" - 18 NPT.
- Protection: 3 times working range.
- Rupture: 6 times FS limited to 900 bar.
- Accuracy: < ±0.5% working range, including hysteresis, linearity and repeatability.
- Quickon electrical connector with IP67 protection.
- Output: two-wire 4-20 mA.
- Power supply: 8 to 33 Vdc;
- Dimensions: Ø 23 x 82 mm.
- Weight: 98 g.

511

The **511** series of pressure transmitters were designed for high volume and low cost OEM industrial and commercial applications in the measurement of gas and liquid pressures.
Built around a high mechanical stability ceramic sensor which withstand a broad temperature range, they are particularly suited for use in the field of industrial compressors and steam measurements.

- Range: -1 to 600 bar in several steps.
- Working temperature: -25 to 85°C.
- Media material: ceramic and 1.4305 stainless steel (AISI 303)
- Accuracy: < ±0.3% FS including hysteresis, linearity and repeatability.
- Pressure connection: 1/4-18NPT.
- Rupture pressure: 2.5 times FS limited to 900 bar. Patented PPS media stopper avoids fluid leakage.
- Quickon electrical connector, IP 67 protection.
- Output: two-wire 4-20 mA.
- Power supply: 8 to 33 Vdc.
- Dimensions: Ø 23 x 82 mm.
- Weight: 95 g.

691

Designed for high performance applications, the **691** series of pressure transmitters features great accuracy at moderate cost in the range of 600 bar relative pressure or 16 bar absolute.

- Maximum range: -1 to 600 bar (relative pressure); 0 to 15 bar (absolute pressure).
- Working temperature: -15 to 80°C.
- Media material: ceramic and 1.4305 stainless steel (AISI 303)
- Accuracy: 0.3% FS including hysteresis, linearity and repeatability.
- Pressure connection: 1/4-18 NPT or external ½"-14 NPT.
- Protection: 2 X measuring range Rupture pressure: 3 X measure range.
- Electrical connector: DIN 43650-A, IP65 or cable gland with 1.5m cable.
- Output: two-wire 4-20 mA. Other under request.
- Electromagnetic compatibility: CE conformity to EC directive 89/336.
- Power supply: 11 to 33 Vdc.
- Dimensions: Ø 36 x 64 mm.

PRESSURE TRANSMITTERS

692

The **692** series of differential pressure transmitters use unique ceramic technology to accurately measure from 0 to 0.1 bar up to 0 to 25 bar differential and yet withstanding high one-side overloads .

- Ranges: 0 to 0.1 bar and up to 0 to 2.5 bar
- Working temperature: -15 to 80°C.
- Media material: ceramic and 1.4305 stainless steel (AISI 303)
- Accuracy: 0.5% FS including hysteresis, linearity and repeatability.
- Pressure connection: 1/8" NPT thread or push-on spigot.
- System pressure: 25bar for 10 bar range unit and 50 for 25 bar range unit.
- Rupture pressure: 1.5X system pressure.
- Electrical connector: DIN 43650-A, IP65 or cable gland with 1.5 m cable.
- Output: two-wire 4-20 mA. Other signals under request.
- Electromagnetic compatibility: CE conformity to EC directive 89/336.
- Power supply: 11 to 33 Vdc.
- Dimensions: Ø 45 x 89 mm.

694

The 694 series of differential transmitters are ideal for high accuracy monitoring and controlling low air flow in air-conditioning systems, in clean rooms applications, fine pressures in laboratories and in critical filters of non-corrosive gases.

- Possible ranges: 0 to 1 mbar; 0 to 3; 0-5; 0-10; 0-16; 0-25 and 0 to 50 mbar.
- Working temperature: 0 to 70°C.
- Silicone diaphragm LSR bi-component
- Rupture pressure: 500 mbar.
- Accuracy: ±1% at 0-1mbar (worst case)
- Pressure connections: 2 Ø 6.2 mm pipes
- Electrical connections: 6.3 mm lugs and PG11 cable gland.
- Output: two-wire 4-20 mA or 0-10 Vdc.
- Response time: less than 10 ms.
- Optional: square root extraction.
- Power supply: 11 to 33 Vdc.
- Electrical magnetic compatibility conforms to CE standards.
- Enclosure conforms to UI94.
- Dimensions: 92 x 75 x 49 mm.

604

Used as DP flow switch in ventilation ducts for the control of filters and fans, and in primary and secondary control systems for the control of dampers.
Precise setpoint adjustment is done through individual scale and by turning knob.

- Ranges: 0.2 to 3 mbar; 0.5 to 5mbar; 1-10 mbar; 0 to 50 mbar and 10 to 50 mbar.
- Electrical contact: 5 A @ 250 Vac SPDT; 2 A @ 30 Vdc.
- Service life: 106 switching cycles
- Working temperature: -30° to 70°C.
- Silicone LSR diaphragm.
- Lowest turn-on pressure: 0.2 mbar.
- Hysteresis: 0.1 mbar.
- Repeatibility: ±0.025 mbar (0.2-3 mbar); ±0.05 (0.5-20 mbar); ±0,15 (10-50 mbar).
- Overpressure protection: 75 mbar.
- Pressure connection: 2 pipes Ø 6.2 mm
- Electrical connection: 6.3 mm lugs and PG11 gland.
- Fiber glass reinforced plastic enclosure.
- Protection: IP54.
- Dimensions: 103 x 88 x 55 mm.

ELECTRONIC THERMOSTATS

N320

The **N320** electronic thermometers are used to indicate temperature with high degree of accuracy. It is provided with a convenient built-in full range high efficiency switching mode power supply.

- Sensors: NTC thermistor (-50 to 120°C), Pt100 (-50 to 300°C), Pt1000 (-200 to 530°C) or J thermocouple (0 to 600°C).
- Accuracy: 0.6°C (NTC), 0.7°C (Pt100 and Pt1000) 3°C (thermocouple).
- IP65 front panel with silicone rubber keys.
- Display: 3½ LED digits, 13 mm height.
- Resolution: 0.1 from -19.9 to 99.9°C
- Sampling: 1.5 per second.
- Control relay: 10 A, SPDT, 250 Vac.
- Adjustable hysteresis.
- Sampling: 1.5 per second.
- Working temperature: 0 to +50°C
- Internal power supply: 85 to 250 Vac.
- Enclosure: flame retardant polycarbonate.
- Dimensions: 74 x 32 x 58 mm.

OPTIONS:
- RS485 interface with Modbus protocol.
- Power supply: 12 to 24 Vdc/ac.

N321 & N321R

The **N321** thermostats can be programmed for heating or cooling action and have timed delay function for compressors.

N321R performs automatic defrost cycles by stopping the compressor at programmed intervals or manually, via keyboard. The temperature readout is held static during defrost and the compressor relay has a delay action at energy start up.

- Sensors: NTC thermistor, Pt100, Pt1000 or J type thermocouple (except N321R)
- Control relay: SPDT, 10 A / 250 Vac.
- Internal power supply: 85 to 250 Vac.
- IP65 front panel with silicone rubber keys.
- Resolution: 0.1 from -19.9 to 99.9°C
- Accuracy: ± 0.6°C for NTC, ± 0.7°C for RTD and ± 3°C for thermocouple.
- Adjustable hysteresis.
- Sampling: 1.5 per second.
- Working temperature: 0 to +50°C.
- Dimensions: 74 x 32 x 58 mm.

OPTIONS:
- RS485 interface with Modbus protocol.
- Power supply: 12 to 24 Vdc/ac.

N322 & N322T

N322 has 2 control relays with independent setpoints used for heating and cooling. The second relay can be relative to the first one.

N322T finds applications in heating and cooling processes with built-in timer functions for forced defrost periods or other timed or interval related actions.

- Sensors: NTC thermistor, Pt100, Pt1000 or J type thermocouple.
- Control relay: SPDT, 10 A / 250 Vac.
- Timer relay: SPST, 3 A / 250 Vac (N322T).
- Internal power supply: 85 to 250 Vac.
- IP65 front panel with silicone rubber keys.
- Resolution: 0.1 from -19.9 to 99.9°C
- Accuracy: ± 0.6°C for NTC, ± 0.7°C for RTD and ± 3°C for thermocouple.
- Adjustable hysteresis.
- Sampling: 1.5 per second.
- Working temperature: 0 to +50°C.
- Dimensions: 74 x 32 x 58 mm.

OPTIONS:
- RS485 interface with Modbus protocol.
- Power supply: 12 to 24 Vdc/ac.

TEMPERATURE METER & LOGGER

SmartMeter

SmartMeter is a portable dual channel temperature meter which accepts 2 simultaneous thermocouples or Pt100 sensors.
It features a slick yet sturdy enclosure with protective rubber corners and improved hand grip. The swivel stand provides bench position and is also a belt carrying fixture.
A high contrast multi-segment LCD display with specific icons shows min/max, hold, difference and average measurements.

- Measures 2 simultaneous thermocouples (types J, K, T, R or S) and Pt100 RTD.
- Compensates for Pt100 three-wire cable resistance and for t/c cold junction.
- Accuracy: 0.2% FS for Pt100 and 0.25% FS ±1°C for thermocouples.
- Sampling: 2 measurements per second.
- Power: 9 V battery (life time 1 year).
- Input for external power adaptor.
- Internal buzzer for max/min alarm indication
- Dual sub-miniature compensated thermocouple and Pt100 input connectors.
- Operating conditions: 0-50°C, 10-90% RH.
- Programable auto-shutt off time
- Dimensions: 161 x 71 x 34 mm.

SmartLogger

Smart Logger is the data logger version of Smart Meter.

Besides all features from the above meter it has a built-in real time clock, internal memory for 16,000 measurements and a USB interface for fast data transfer to a PC.

A complete Windows® compatible software displays the measurements in digital form, bargraph, scale, etc., and plots and prints graphs, lists loggings and exports data to spreadsheets.

SmartLogger has the following additional features:

- Digital comm interface: USB 1.1 with type B mini-connector.
- PC Software: compatible with Windows® 2000, XP and above.
- Supports graphs and data export in txt, xls, xml, html, doc file formats.
- Memory capacity: 16,000 loggins including date and time (hh:mm:ss) of recording.
- Logging start and stop is done from the keypad.

RELATIVE HUMIDITY & TEMPERATURE

Pocket Meter 8701

This practical and convenient pocket instrument accurately measures and displays temperature and relative humidity simultaneously.
It is an invaluable companion for the HVAC technicians, laboratory researchers, food storage operators, librarians, or any professional involved in computer rooms, printing shops, paper, pulp, wood and tobacco plants.

- Measuring range: 5-95% RH; -10 to 50°C
- Accuracy: ±3% FS for RH and ±0.2% for temperature.
- Sensors: capacitive polymer for RH and precision thermistor for °C.
- Respose time: 60s typical.
- HOLD function for freezing the display.
- HI and LO memory.
- Auto shut-off in 20 seconds.
- Measures in °C and °F.
- Powered by 2 AAA batteries.
- Elegant enclosure with protective case.
- Convenient pocket clip.
- Dimensions: 48 x 165 x 16 mm.

SOLID STATE RELAYS
SSR

These electronic devices are used for switching resistive and inductive loads and outperform the conventional mechanical relays with great advantages.

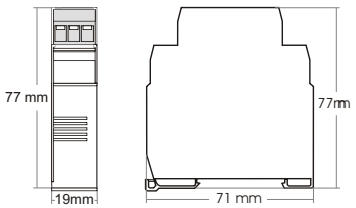
The life cycle with millions of operations, the high switching speed without mechanical or electrical noise, no dangerous sparks or wearing, and the low power needed for switching make the solid state relays a perfect choice when high control accuracy is fundamental.

- Currents from 10 A, 25 A and 40 A.
- Maximum voltage: 250 Vac or 480 Vac.
- Status LED.
- Internal snubber for dv/dt protection.
- Switching at zero crossing.
- Switching voltage: 4 to 32 Vdc.
- High switching speed.
- Optical isolation between gate and power.
- High noise reduction.
- Requires minimum power for switching.
- Heat sink without voltage.
- Does not generate EMI or RFI.

DIN RAIL POWER SUPPLY
FTR

This switching mode electronic power supply is ideal for powering small industrial devices as signal transmitters and isolators. Internal panel mounting on DIN 35 mm rail is quick and the easy access to the screw terminal connectors make final assembly easy.

- Input voltage: 85-250 Vac / 50~60 Hz.
- Ouptut voltage: 24 Vdc, ±5%.
- Ouput power: 3 W.
- Isolation from input and output: 2500 V.
- Enclosure protection: IP40.
- Operating temperature: -10 to 65°C.
- Relative humidity: 0 to 90% RH.
- Mounting: DIN 35mm Rail.
- Dimensions: 71 x 77 x 19 mm.



ISOLATED CONVERTER
USB - i485

The **USB-i485** module is a cost-effective way to convert RS485 or RS422 industrial buses to a USB interface. When connected to a PC USB port the **USB-i485** module is automatically detected and is installed as a native COM port which is compatible with any existing serial communication application. Muliple modules can be installed when using USB hubs thus allowing a hassle-free configuration of a multi serial system.

1500 V isolation protects the PC from spykes or possible misconnections in the RS485 industrial bus.

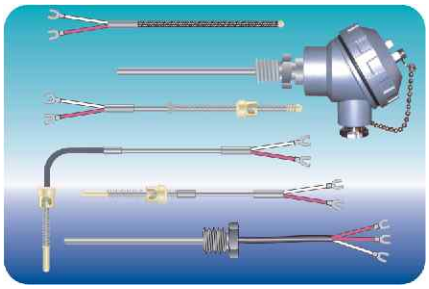
- USB V1.1 Plug and Play interface.
- Virtual COM port driver for Windows® 98/ME/2000/XP/CE, MAC & Linux.
- Jumper selected RS485 / RS422.
- Automatic flow control for RS485.
- Transmission rate: 300 bps to 1 Mbps.
- Dual RS485 bus: Connection of up to 64 unit load RS485 devices.
- Power: from the USB port.
- Isolation: 1500 Vdc from USB interface and the RS485/RS422 interface.
- RS485/422 bus protection: ±60 Vdc, 15 kV ESD.
- Dimension: 70 x 60 x 18 mm.

LCD THERMOMETER
TM1210

TM1210 is a simple and accurate thermometer measuring temperatures from -40 to 70°C (or 100ºC). It is provided with a water proof external sensor and installation can be done in a panel cut-out or as a stick-on device. Applications are in HVAC, freezers, food displays, pools, aquariums, boilers, ovens, solar heating systems, etc.

- Range: -40°C to 70°C (optional 100°C).
- Accuracy:±0.3°C at 20°C and ±1°C at the extremes. Resolution is 0.1°C.
- Water proof NTC thermistor sensor.
- Sensor cable: 3 mm diam. and 3m length.
- Powered by a 1.5V LR44 button cell.
- Dimensions: 48 x 28.6 mm, 13.5 mm depth.

TEMPERATURE SENSORS



- Bare thermocouples.
- Ceramic tube thermocouples.
- SS sheathed mineral thermocouples.
- Thermocouple probes for plastic processing machinery.
- SS sheathed RTDs.
- Mineral insulation RTDs.
- Pt100 RTDs for electric motors and generator stator slots.
- Flexible probes.
- Air and gases termperature probes.
- Fast response surface temperature probes.

Pt100 & T/C Heads

Pt100 manufactured with thin film technology on a flat ceramic substrate or wire wound on cylindrical ceramic or with glass body, they provide an excellent means for high accuracy temperature detection.

- Thin film: -50°C to 600°C, class A and B
- Sizes: 1.6 x 3.2 mm and 2 x 5 mm
- Wire wound: -200°C to 650°C, class A & B
- Sizes: 0.7 x 5 mm to 2.8 x 30 mm.

Polyamide thermocouple heads and terminal blocks good for peaks of up to 220°C or in die cast aluminium body with epoxy coating in DIN sizes A and B.

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