



Acquisition • Measurement • Control



Actual Size

**The Tracker 300 Series**  
Signal Conditioners  
Data Acquisition  
PID Control  
Alarm Trip

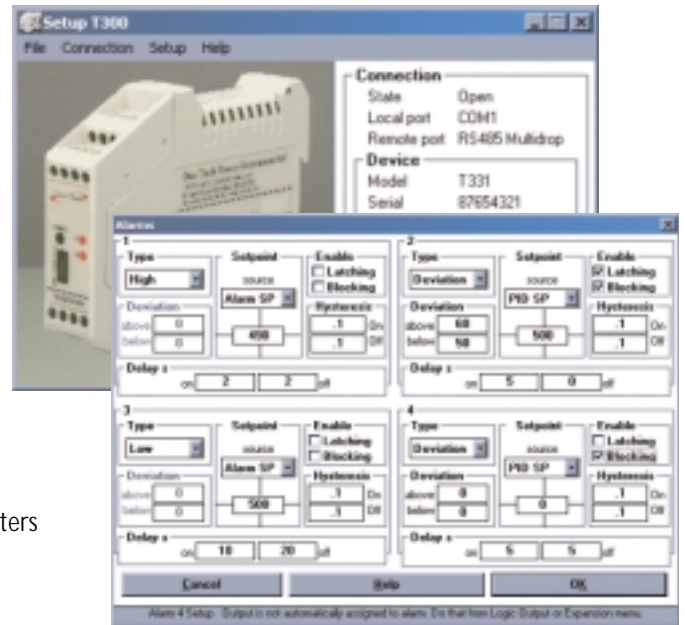
# TRACKER 300

## The Tracker 300 series

The Tracker 300 series is a low cost Signal Conditioner, Trip Amplifier and PID Controller, for use in a variety of process applications. Its small size enables high packing density on standard TS35 DIN rail. A built in power supply, transmitter excitation and serial RS485 interface provides genuine single loop integrity with distributed data acquisition and control.

## FEATURES

- Universal 20 bit input provides accurate measurement of a wide range of sensors
- Real time data available via the isolated RS485 serial interface
- Fully configurable by PC software – no internal links or potentiometers



## Signal Conditioning

The isolation provided in the Tracker 300 series eliminates earth loops, which can cause noisy, inaccurate measurements. Any Tracker 320 or 330 module can be fitted with an isolated analogue output for signal re-transmission.



- Accurate analogue re-transmission of 1 part in 32,000 (15bit) 4-20mA, 0-20mA or 0-10VDC output.
- Linearisation of thermocouple and RTD sensors, so the output is linear to temperature
- User configurable linearisation for applications such as tank contents measurements.



## Distributed Data Acquisition

Often the largest expense of a data acquisition system is the wiring. The Tracker 300 uses a simple two-wire communications link greatly reducing wiring costs and simplifying installation.

- Will power a two-wire transmitter (24VDC) or a strain gauge device (10VDC)
- Enables wiring runs of up to 1.2 km on RS485 interface, allows distribution to a single channel
- MODBUS RTU communications protocol allows easy integration with industry standard software

# THE DEFINITIVE SOLUTION

## PID Control

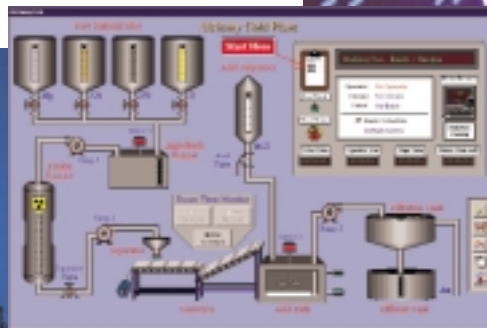
The Tracker 331 & 332 models are fully featured auto tuning PID controllers providing genuine single loop integrity to plant control systems.

- Auto-tune for automatic setting of the PID values; reverse or direct acting
- "Self defence" feature ensures safe operation of the process should there be a loss of communication for longer than a pre-set period
- Can use pulse width modulated SSR / relay logic or analogue outputs

## Condition Monitoring

Plant shut downs can be time consuming and expensive. The Tracker 300 series allows the user to plan more effective maintenance by monitoring thermocouple ageing and the health of electrical loads.

- Alarms when thermocouple shows signs of deterioration
- Checks for partial electrical load failure, overloads and open loads (PWM control only)
- Indicates which components should be replaced during scheduled maintenance



## Flexible Alarm Trips

The Tracker 300 series can be used as a trip amplifier by using the dual relays on the Tracker 331 or by adding a Tracker 340 Logic Expansion Module to any module in the series.

- The use of on and off delay timers and hysteresis functions stops nuisance or "fleeting" alarms
- An alarm can operate more than one output, allowing different circuit voltages to be switched
- Alarm actions can be high, low or deviation; latching or non-latching; standard or fail safe operation
- Alarm Blocking feature for startup conditions

## Logic Expansion

The Tracker 340 Logic Expansion Module provides additional logic inputs and outputs for monitoring and control applications. All logic states can be read via the communications interface. Logic inputs can also be configured to perform a number of functions i.e. zero, tare, reset max/min.

- Four C/O relay or TTL outputs and two logic inputs
- Six front panel LED's indicate the input and output states
- Plugs into and is powered by a Tracker 320 or 330





## Tracker 300 Specifications

### Maths Functions

18 Point user linearisation, Max / Min (Peak/Valley) memory  
Square root, S.G. Correction, Zero, Tare

### Alarm Functions

High, Low, Deviation (band), on delay time, off delay time, hysteresis, output selection (one alarm can switch more than one output)

Outputs energised or de-energised in the alarm state

### PID Control (T331 & 332 Models only)

Type: PID with Auto-tune, PWM Logic or Analogue outputs

Control Action: Reverse, Direct or Heat / Cool

PWM Cycle Times: 0.1Sec to 30mins (Independent per output)

Auto / Manual switching: Via logic input (T340) or Communications Load and Partial Electrical Load Failure Function (PWM outputs only)

### A/D Converter

Type: Sigma Delta, Resolution: 20 Bit plus Sign

Drift with temperature: <100ppm/°C

Update Rate: 15 / Second (7.5 / Sec for PV measurement)

Common / Series mode rejection: >150dB / >70dB (50 & 60Hz)

### Thermocouple/RTD Measurement

Linearised ranges: Types J, K, T, N, B, S, R Thermocouples and

3 wire RTD Pt100 (alpha = 385) and Pt100 (alpha = 392)

Typical accuracy: Base Metal ±0.5°C, Rare Metal ±1.2 °C,

RTD 0.3°C. Engineering units: °C, °F or Kelvin

RTD Excitation current 0.25mA (Nom)

Thermocouple ageing feature and open circuit alarms

### DC Voltage, Current & Resistance Inputs

Ranges (Impedance): ±100mV(1000M),

±10VDC(1M) and ±20mA(<5)

Accuracy: 0.02% Typical

### Sensor Excitation Supply (Tracker 321 & 332)

Two Wire Loop Supply: 24VDC (Nom) @ 35mA max

Bridge Supply: 10VDC Regulated @ 35mA max

### Logic Outputs (Tracker 331 only)

Relays Type: 1 x Normally open contacts. (Optionally 2 - No SSR)

Rating: 1 Amp @ 240VAC, 5 Amp @ 30VDC

SSR Drive output: 1 x 18VDC @ 20mA nominal

### Serial Communications Interface

Type: RS485, 2-wire multidrop

Isolation: 500V DC/peak AC. Baud rate: Up to 19200

Protocols: Modbus RTU, Modbus Floating point and DTP1 (ASCII)

### Analogue Output (Option for all models)

Isolation: 500VDC / Peak AC

Output: Selectable 0-10V, 0-20mA or 4-20mA, Scalable

Maximum Load (mA): 1000 Ohms

Resolution: 15bit (1 part in 32768)

### Tracker 340 Logic Modules (Option for all models)

Relays Types (4): Volt Free Change over contacts (TTL options)

Rating: 1 Amp @ 250VAC, 5 Amp @ 30VDC

Logic Inputs (2): Volt free contacts or TTL

### Environmental

Temperature: 0-60°C Operating, -10 - 70°C Storage

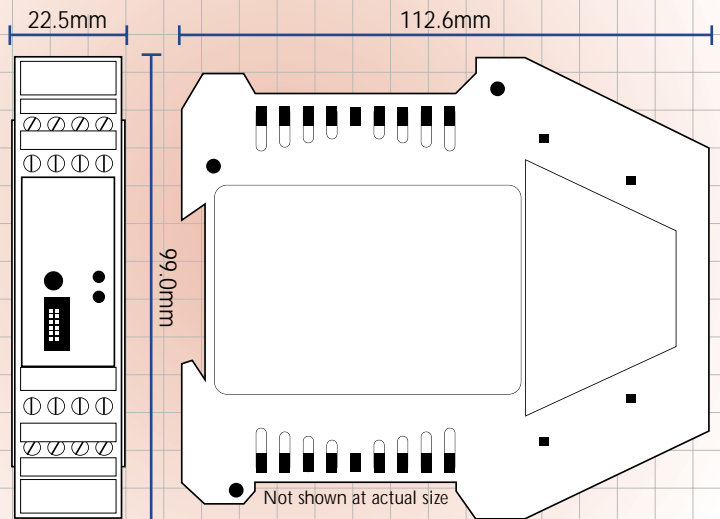
Humidity: 10-95% RH Non Condensing

### Safety and EMC

Safety: EN61010, Susceptibility: EN50082-2

Emissions EN50081-1

CE certified 2004



Note: Depth 114.5mm when mounted on Din Rail TS35 / TS35D



Industrial enclosures kindly supplied by Rittal Ltd.



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All Tracker 300 units have been tested and comply with the European Directives on Electromagnetic Compatibility and safety and each carries the CE marking.

The enclosure is manufactured in re-cyclable and flame-retardant materials.

### DATA TRACK PROCESS INSTRUMENTS

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### Ordering Code



Model Number      Analogue Output      Power      2nd Relay T331 only      Logic Module (if required)

Model:      321 Data Acquisition Module / signal conditioner  
              331 PID Controller / Trip Amp.  
              332 PID As 321 + PID Control (Requires T340 or analogue output option fitted for PID output)

Analogue: A = Output Fitted, N = Not Fitted

Power:      1 = 90-265vac 50/60 Hz (5VA)  
              2 = 24VDC / AC (5VA)

2nd RelayR = Fitted (Replaces SSR drive, 2 relays supplied)  
T331 onlyN = Not fitted (1 x Relay + 1 x SSR drive supplied)

Logic Module: 341 = 4 x Relay (C/O) Outputs  
(All with 2      342 = 1 x TTL + 3 x Relay (C/O) Outputs  
Logic inputs) 343 = 4 x TTL Outputs