Datapaq® Furnace Tracker®
System Components

DATA LOGGERS

Datapaq TP3 Logger

Supremely powerful, accurate and flexible tool for in-depth data-collection, ideal for all applications. Can be combined with a built-in transmitter to see temperature profiles developing in real time (see below, and 'Radio Telemetry' section).

- Two **model sizes** to suit different applications:
  Narrow   20.5 × 97 × 198 mm/0.8 × 3.8 × 7.8 in.
  Wide   20.5 × 124 × 177 mm/0.8 × 4.9 × 7.0 in.
- Huge **memory capacity** for detailed process analysis: a total of over 3.6 million data-points.
- Ten or 20 **thermocouple channels** (depending on model size; see below) for maximum data collection on each run.
- Can be specified for use with various **thermocouple types** (B, J, K, N, R, S, T) and with **analog inputs** (current and/or voltage) – or with a **mixture** of thermocouple types and/or analog inputs.
- Powered by standard **alkaline AA batteries** or by user-replaceable **rechargeable NiMH batteries**; for **high-temperature** applications involving logger operating temperatures (i.e. inside the thermal barrier) of up to 110°C/230°F, can also be powered by non-rechargeable **lithium batteries**. Any logger can use any battery-type interchangeably if appropriate battery housings are used (available separately; see below).
- **USB** and **Bluetooth** communication.

For full specification, contact Datapaq.

TP3000	Narrow, 10 channels.
TP3300	Narrow, 20 channels.
TP3400	Wide, 20 channels (wide models are 20-channel only).

XDL12 Logger

The XDL12 operates outside the high-temperature environment, gathering data from thermocouples within by hardwired telemetry. In conjunction with Datapaq Insight software, temperature profiles can then be watched developing – and be analyzed – in real time. The XDL12 is particularly suitable for use with Insight Furnace Surveying software, for assessing a furnace's accuracy and uniformity of heating and its compliance with AMS 2750 or other standards. Insight will support up to three XDL12 loggers, thus gathering data from 36 channels.
The logger's key features are:

- Twelve **thermocouple channels** for maximum data collection on each run.
- Can be specified for use with various **thermocouple types** (J, K, N, R, S, T) or with a **mixture** of up to three thermocouple types.
- Powered by **rechargeable NiMH batteries**.
- High **accuracy** for compliance to tight specifications (AMS 2750, NADCAP):
  ±0.3°C/0.5°F, for type K, J and T thermocouples
  ±0.4°C/0.7°F, for type N thermocouples
- **USB** communication.
- **Lightweight** and portable: 6.5 kg/14.3 lb.
- **Dimensions** 80 × 330 × 340 mm/3.1 × 13.0 × 13.4 in.

XDL0012	Specify thermocouple types, e.g. XD0012/10K/2S.

LOGGER CABLES, CHARGER AND BLUETOOTH

CI1150 **USB Communications Lead for TP3 Logger**

Connects logger to PC to enable logger reset, data download or display of real-time data-collection.

CI3029 **70°C Communications Lead for Q18 and Tpaq21 Loggers**

CI1033 **USB Communications Lead for High-temperature Tpaq21 Logger**

For use only with high-ambient-temperature loggers with lithium batteries. No power socket.

CH0070 **Charger/Power-supply Unit**

For TP3, XDL12, Q18 and Tpaq21 loggers, and TM21 primary receiver.

CI1034 **Bluetooth Classic USB Adapter**

Suitable for use with a PC or laptop which does not have Bluetooth built-in, in order to permit Bluetooth communication with TP3 logger.

LOGGER BATTERIES

Any TP3 logger can use any of the three battery-types interchangeably if appropriate battery housings are used. Battery housings are user-replaceable.

NiMH Rechargeable Batteries, for TP3 Logger: Battery Housing and Battery-pack

NiMH battery-packs are user-replaceable.
BP3000 Battery housing plus battery-pack (as in photo).
BP3010 Battery housing (does not include batteries).
BP3001 Battery-pack (does not include housing).

Alkaline AA Batteries, for TP3 Logger: Battery Housing and Battery-pack

**BP3051** Battery housing plus battery-pack (as in photo).
BP3050 Battery housing (does not include batteries).
BP0011 Pack of four batteries (does not include housing).

Lithium Batteries, for TP3 Logger: Battery Housing and Battery-pack

Lithium batteries are non-rechargeable and are for high-temperature use. Battery life up to 250 hrs depending on sample interval, operating temperature and use of telemetry. Maximum operating temperature 110°C/230°F. *Only lithium batteries supplied by Datapaq are suitable for use with Datapaq loggers. Lithium batteries are potentially dangerous: you must read the relevant section of your logger's User Manual and the Safety Data Sheet supplied with the batteries*.
BP3021 Battery housing plus battery-pack (as in photo).
BP3100 Battery housing (does not include batteries).
BP0021 Pack of four batteries. Also suitable for high-temperature versions of Tpaq21 logger. *Maximum six packs per shipment*.
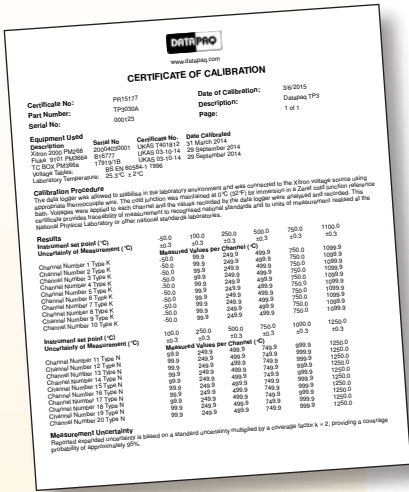
CALIBRATION CERTIFICATES

CS2079 **Thermocouple Certificate of Conformity**

Certificate documenting conformance of thermocouple batch to either ANSI 96.1 (type K) or British Standard Class 1 (type T).

CS2080 **Thermocouple Certificate of Conformity**

Thermocouple calibration certificate of conformity to ISO 17025. 10 thermocouples, type K only. Covers 10 thermocouples and the following readings measured between start and end of the spool: 300°C/572°F, 500°C/932°F, 700°C/1,292°F, 950°C/1,742°F, 1,100°C/2,012°F, 1,250°C/2,282°F.

Thermocouple Certificate of Calibration

Individual thermocouple calibration (ISO 17025).
CS2081 One reading on one thermocouple.
CS2082 Two readings on one thermocouple.
CS2083 Three readings on one thermocouple.

CS2084 **Thermocouple Certificate of Calibration, to Comply with AMS 2750**

Thermocouple calibration (ISO 17025). 10 thermocouples, type N only. Covers 10 thermocouples and the following readings measured between the start and end of the spool: 130°C/266°F, 270°C/518°F, 410°C/770°F, 550°C/1,022°F, 690°C/1,274°F, 830°C/1,526°F, 970°C/1,778°F, 1,110°C/2,030°F, 1,250°C/2,282°F.

RC0001 **Recalibration of TP3 or Tpaq21 Data Logger**

Comprises:
- Electronic calibration and adjustment of logger.
- Issue of calibration certificate traceable to national standards.
- Full test of functionality including battery testing, 14-hr thermal-stress testing and temperature-stability testing.

Fixed Standard Recalibration/Service of TP3 or Tpaq21 Data Logger

As RC0001, plus minor repairs such as replacement of battery and electronic components.
RC0005 Standard
RC0006 Including issue of ISO 17025 accredited calibration certificate.
RC0007 Including issue of AMS 2750 certified calibration certificate.

SC0001 **Service Contract, 12 months**

Comprises:
- Use of loan equipment in case of any failure or damage.
- Electronic calibration and adjustment of logger.
- Issue of ISO 17025 accredited calibration certificate if applicable.
- Full test of functionality including battery testing, 14-hr thermal-stress testing and temperature-stability testing.
- Annual full service of equipment.
- Logger firmware and Insight software updates.
- Minor logger repairs.

SC0003 **AMS 2750 Service Contract, 12 months**

As SC0001, but:
- 1 × electronic calibration and adjustment of logger, and issue of AMS 2750 calibration certificate.
- 3 × calibration checks and issue of AMS 2750 certificates.

SC0004 **AMS 2750 Service Contract for Indirect Territories, 12 months**

As SC0003, but also use of loan logger for alternating 3-month periods while customer's logger is being calibrated by Datapaq.

THERMAL BARRIERS

Thermal barriers to suit an extensive range of applications are available from stock or can be designed and built to order. Contact Datapaq directly for guidance on barriers appropriate to the specific needs of your process.

HEATSINKS

TB1001 **Stainless-steel 'Slab' Heatsink (Single)**
Stainless-steel case filled with phase-change material. Phase change at 58°C/136°F. Weight 1.0 kg/2.2 lb.

Furnace Heatsink for Thermal Barriers TB4012, TB4912 and up
TB1066 For TP3 or Tpaq21 loggers.
TB1069 For Q18 logger DQ1860.
TB9102 For use with two TP3 loggers or two Tpaq21 loggers in one thermal barrier.
TB9100 For use with two Q18 DQ1860 loggers in one thermal barrier.

TB9840D **Special Heatsink for Vacuum and Gas-quench Applications**
For TP3 or Tpaq21 logger, in high-vacuum applications at 10^{-3} to 10^{-7} Torr/ 2×10^{-5} to 2×10^{-9} psi and gas-quench applications at 2–20 bar/29–290 psi. Similar to TB1066 but for pressure environments. Supplied as standard with TB4500 series and TB4600 series barriers.

Special Heatsink for Pressure Applications (Gas Quench, Autoclave)
TB9902 For TP3 or Tpaq21 loggers. Similar to TB1001 but for pressure environments.
TB9901 For use with two TP3 loggers or two Tpaq21 loggers in one thermal barrier. Similar to TB9102 but for pressure environments.

THERMAL BARRIER ACCESSORIES

CS2018 **Replaceable Mullite Wear-strip for TB4900 Thermal Barrier**
Stitched cloth, sufficient to replace wear-strip in lid and base.
100×900 mm/3.9×35.4 in. (sufficient for top and base replacement).
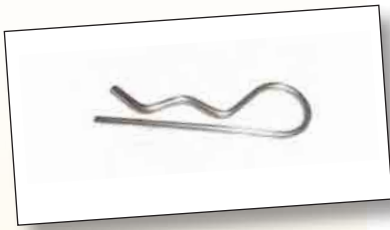
Gas-quench Deflectors
Upper and lower deflectors for specific thermal barriers.
TB4526A30 For TB4526 thermal barrier.
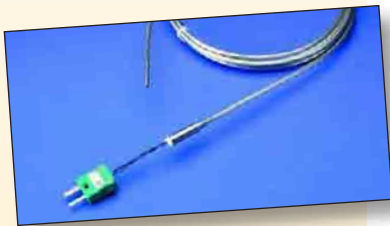**TB4533A30** For TB4533 thermal barrier.
TB4538A30 For TB4538 thermal barrier.

SC0084   **Retaining Clip**

Pack of 8 R-clips used to lock catches on gas-quench deflectors TB4526A30, TB4533A30, TB4538A30.

THERMOCOUPLES

Thermocouple, Mineral-insulated, Type K, 1.6 mm/0.06 in. Diameter, Nicrobell™ Sheath

Operating range 0−1,250°C/32−2,280°F. Fitted with miniature high-temperature plug for direct connection to data logger.

PA0713	0.5 m/1.6 ft	PA0715	5 m/16.4 ft
PA0710	1 m/3.3 ft	PA0718	6 m/19.7 ft
PA0711	2 m/6.6 ft	PA0716	8 m/26.2 ft. Non-stock item.
PA0712	3 m/9.8 ft	PA0719	9 m/29.5 ft
PA0714	4 m/13.1 ft	PA0717	10 m/32.8 ft

Thermocouple, Mineral-insulated, Type K, 3 mm/0.12 in. Diameter, Nicrobell™ Sheath

For high temperature steel re-heat applications. Operating range 0−1,300°C/32−2.372°F. Terminated with flexible PTFE tail and high-temperature plastic plug.

PA0760	Length 3−8 m/9.8−26.2 ft, specified by customer. Allow four weeks for manufacture.		
PA0761	1 m/3.3 ft	PA0766	6 m/19.7 ft
PA0762	2 m/6.6 ft	PA0767	7 m/23.0 ft
PA0763	3 m/9.8 ft	PA0768	8 m/26.2 ft
PA0764	4 m/13.1 ft	PA0769	9 m/29.5 ft
PA0765	5 m/16.4 ft		

Fast-response Exposed-junction Thermocouple

Type K fiberglass braid (high-temperature varnish), 0.2 mm/0.008 in. (32 AWG) single-strand wire. Accuracy ±0.4% or ±1.1°C/2.0°F. ANSI MC96.1 (special limits). Maximum intermittent temperature 700°C/1,292°F, maximum continuous temperature 600°C/1,112°F.

PA0830	1 m/3.3 ft
PA0831	2 m/6.6 ft
PA0832	3 m/9.8 ft

Thermocouple, Mineral-insulated, Type K, 1.0 mm/0.04 in. Diameter, Inconel™ Sheath

Operating range 0−1,000°C/32−1.832°F. Terminated with miniature high-temperature plastic plug.

PA0923	0.5 m/1.6 ft
PA0920	1 m/3.3 ft
PA0921	2 m/6.6 ft
PA0922	3 m/9.8 ft

Thermocouple, Mineral-insulated, Type K, 1.0 mm/0.04 in. Diameter, 'Nextel' Sheath

For plasma nitriding applications. Includes 10 ceramic inserts, for inserting into workpiece.

PA1563	0.5 m/1.6 ft
PA1560	1 m/3.3 ft
PA1561	2 m/6.6 ft
PA1562	3 m/9.8 ft

Thermocouple for Furnace Surveying Applications: Mineral-insulated, Type N, 2.0 mm/0.08 in. Diameter

Maximum operating temperature 1,250°C/2,280°F. Terminated in miniature high-temperature plug. Complies with AMS 2750 specification only (Table 1, TUS probes). To check compliance with any other specification, contact Datapaq.

PA1580	1 m/3.3 ft
PA1581	2 m/6.6 ft
PA1582	3 m/9.8 ft

RADIO TELEMETRY

TM0100 **TM21 Primary Receiver Kit**

Complete operating primary receiver. Comprises:
- Primary receiver, region-specific – Europe RX4200, USA RX4100, rest of world RX4000.
- Primary-receiver antenna RX1010.
- Terminator TM1060.
- Power supply CH0070.

Contact Datapaq for other country-specific part numbers.

TM21 Primary Receiver

Basic unit without accessories.
RX4200   Europe
RX4100   USA
RX4000   Japan and rest of world

Contact Datapaq for other country-specific part numbers.

TM21 Secondary Receiver Kit with Extension Cable

Receiver kit using remote UGEF antenna to extend receiving range for short continuous furnaces. Comprises:
- 1 × TM21 secondary receiver kit TM0200 (see below).
- 1 × RS485 connecting cable.

TM21-ARX-10   With 10 m cable TM1042.
TM21-ARX-45   With 45 m cable TM1045.

TM0200   **TM21 Secondary Receiver Kit**

Complete operating secondary receiver. Comprises:
- Secondary receiver, region-specific – Europe RX4201, USA RX4101, Japan and rest of world RX4001.
- UGEF antenna RX1023.
- Receiver antenna stand RX1020.
- UGEF antenna and receiver-box mounting kit RX2502.

Contact Datapaq for country-specific part numbers.

TM21 Secondary Receiver

Basic unit without accessories.
RX4201   Europe
RX4101   USA
RX4001   Japan and rest of world

Contact Datapaq for other country-specific part numbers.

RS485 Cable to Link Primary and Secondary Receivers

Supplied on reel.
TM1042   10 m/32.8 ft
TM1045   45 m/147.6 ft
TM1046   100 m/328.1 ft

TM1060   **TM21 RS485 Terminator**

To be connected to last secondary receiver in a chain of receivers; or to primary receiver if it is the only one in the system.

UGEF Antenna, Europe and Japan

Unity-gain end-feed antenna for receiving signal outside the process. Frequency set to for 434.5 MHz for Europe, 429.5 MHz for Japan. Supplied with low-loss coaxial cable as follows.

RX1023 With 1-m/3.3-ft cable.
RX1036 With 10-m/32.8-ft cable.
RX1037 With 20-m/65.6-ft cable.
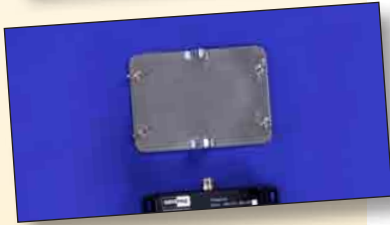**RX1038** With 40-m/131.2-ft cable.
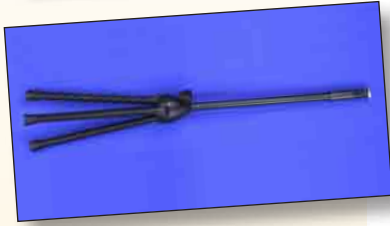
RX1020 UGEF Antenna Stand

For use with antenna RX1023, RX1036, RX1037 or RX1038. Must be used with bracket RX2500.

RX2500 UGEF Antenna Mounting Bracket

For mounting UGEF antenna RX1023, etc., on UGEF antenna stand RX10120. Allows antenna to rotate about horizontal axis.

RX2501 TM21 Receiver-box Mounting Assembly

For mounting secondary receiver RX4201, etc., on UGEF antenna stand below antenna.

RX2502 UGEF Antenna and Receiver-box Mounting Kit

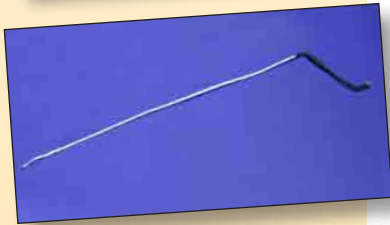Used with antenna stand RX1020 to hold secondary receiver and UGEF antenna. Comprises:
- UGEF antenna mounting bracket RX2500.
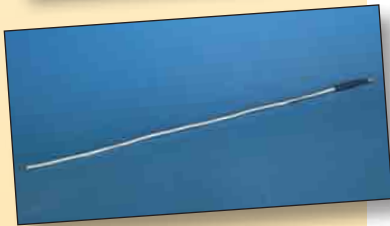- Receiver-box mounting assembly RX2501.
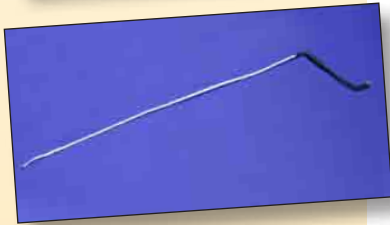
TX2040 Oven Transmitter Antenna, Length 410 mm/16.1 in.

For general applications with Tpaq21 logger.

TX2041 Furnace Transmitter Antenna, Length 820 mm/32.3 in.

For general furnace applications and in large-diameter special thermal barriers and slab-reheat systems.
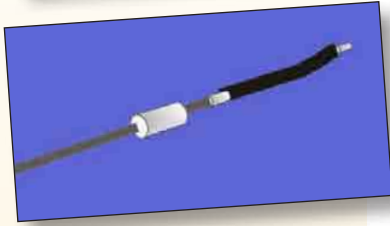
## TX2141 Furnace Transmitter Antenna, Length 820 mm/32.3 in.

For general applications and in large special thermal barriers and slab-reheat systems. Improved reception over TX2041.
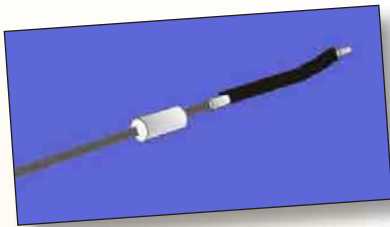
TX2051 **Furnace Transmitter Antenna, Length 410 mm/16.1 in., for Low-height Quench Systems**

For use in TB4072 and TB4101 thermal barriers.

TX2052 **Furnace Transmitter Antenna, Length 820 mm/32.3 in., for Low-height Quench Systems**

For use in TB4065, TB4080, TB4101 and TB4160 thermal barriers.
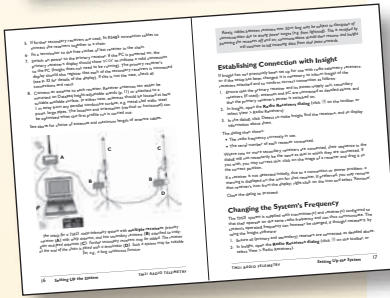
TM21 Radio-telemetry System User Manual

Full information on setup and operation of single- and multiple-receiver systems.

MA5946	Chinese, Simplified	**MA5940**	English	**MA5945**	Italian	**MA5944**	Portuguese
MA59411	Chinese, Traditional	**MA5942**	French	**MA5947**	Japanese	**MA5943**	Spanish
		MA5941	German	**MA5948**	Korean		

MISCELLANEOUS

Digital Thermometer

CS1001	Type K
CS1022	Type R
CS1023	Type S
CS1079	Type N

CS2010 **Insulation Set, 7.2 m/23.6 ft long**

Roll of alumina-fiber insulation blanket (thickness 25 mm/1.0 in., density 128 kg/m^3/7.99 lb/ft^3, 1250 grade). Not to be used in processes above 1,000°C/1,832°F. *Additional shipping cost applies*.

CS2064 **Roll of Alumina-fiber Blanket Insulation, 7.2 m/23.6 ft long**

Thickness 25 mm/1.0 in., density 120 kg/m^3/7.49 lb/ft^3 maximum operating temperature 1,600°C/2,912°F; thermal conductivity 0.27 W/m K. *Additional shipping cost applies*.
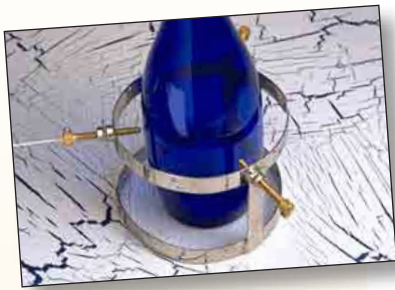
CS2035 **Fixing-tape Kit for Securing Thermocouples to Glass**

Comprises:
- 50 pieces high-temperature fixing tape, 75 × 200 × 2 mm/3.0 × 7.9 × 0.1 in., maximum working temperature 1,000°C/1,832°F.
- 200-g/0.44-lb container of ceramic paste, maximum working temperature 1,000°C/1,832°F.

CS3085 **Stainless-steel Wire, 250 m/820 ft**

PA0521 **'Hot Bottle' Thermocouple Holder**

For product diameter 32–122 mm/1.26–4.80 in. Accepts thermocouples of diameter 1–1.5 mm/0.04–0.06 in.

INSIGHT SOFTWARE

Check www.datapaq.com for latest Insight™ version and features.

Insight Furnace Tracker

Comprehensive and feature-packed tool for obtaining and analyzing temperature profiles from your process: everything from routine quality checks to complex investigations. Wizards lead you step-by-step through all the major functions. Available in various languages.

SW5036	Chinese, Simplified	**SW50310**	Czech	**SW5037**	Italian	**SW50312**	Russian
		SW5030	English	**SW5035**	Japanese	**SW5039**	Slovak
SW50311	Chinese, Traditional	**SW5031**	French	**SW5038**	Korean	**SW5033**	Spanish
		SW5032	German	**SW5034**	Portuguese	**SW50314**	Vietnamese
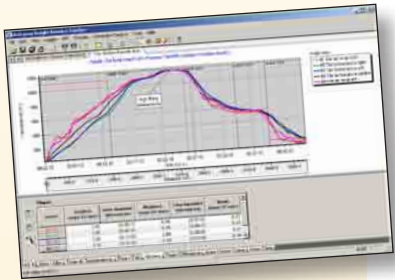
Insight Furnace Surveying

All the features of Insight Furnace Tracker, plus ability to conduct and analyze wizard-driven temperature uniformity surveys to assess the accuracy and uniformity of heating within a furnace – particularly for compliance with controlling specifications, e.g. AMS 2750.
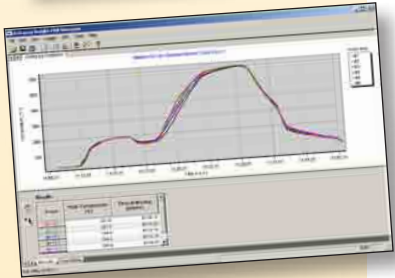
SW5136	Chinese, Simplified	**SW51310**	Czech	**SW5137**	Italian	**SW51312**	Russian
		SW5130	English	**SW5135**	Japanese	**SW5139**	Slovak
SW51311	Chinese, Traditional	**SW5131**	French	**SW5138**	Korean	**SW5133**	Spanish
		SW5132	German	**SW5134**	Portuguese	**SW51314**	Vietnamese
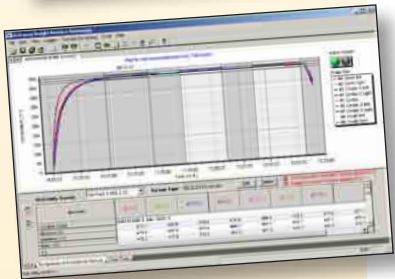
Insight CAB Surveyor

All the features of Insight Furnace Tracker, plus ability to monitor the performance of a furnace by running a standard instrumented survey jig through it using a wizard-driven interface. Temperature-profile results are then analyzed and compared with an existing baseline survey of the furnace to assess whether maintenance or adjustment of the furnace settings is required in order to maintain consistency.

SW5336	Chinese, Simplified	**SW53310**	Czech	**SW5337**	Italian	**SW53312**	Russian
		SW5330	English	**SW5335**	Japanese	**SW5339**	Slovak
SW53311	Chinese, Traditional	**SW5331**	French	**SW5338**	Korean	**SW5333**	Spanish
		SW5332	German	**SW5334**	Portuguese	**SW53314**	Vietnamese

Insight Lite

Use the less-powerful features of Insight Furnace Tracker to carry out the basic processes of data-gathering and analysis of your temperature profiles.

SW5226	Chinese, Simplified	**SW52210**	Czech	**SW5227**	Italian	**SW52212**	Russian
		SW5220	English	**SW5225**	Japanese	**SW5229**	Slovak
SW52211	Chinese, Traditional	**SW5221**	French	**SW5228**	Korean	**SW5223**	Spanish
		SW5222	German	**SW5224**	Portuguese	**SW52214**	Vietnamese

Additional Insight Licenses

L5030 Additional single user license for Insight Furnace Tracker.
L5130 Additional single user license for Insight Furnace Surveying.

Insight Upgrades

Various upgrade/crossgrade options are available. Contact Datapaq for details.

USER DOCUMENTATION

Available in various languages; contact Datapaq for details. Part numbers below are for English versions.

MA6020	Datapaq TP3 Data Logger User Manual
MA6030	Datapaq TP3 Quick Reference Guide
MA5800	XDL12 Data Logger User Manual
MA5740	Datapaq DP5 Data Logger User Manual
MA5110	Q4 and Q18 Data Loggers User Manual
MA5500	Tpaq21 Data Logger User Manual
MA5070	Furnace Tracker User Manual
MA5580	Furnace Surveying User Manual
MA5100	CAB Surveyor User Guide
MA3220	Low-height Quench System User Manual
MA3160	Slab Reheat System User Manual
MA5660	Slab Re-Heat Instructions Using TB4272 Thermal Barrier
MA5960	TB4998 Thermal Barrier for CAB and Aluminum Brazing Processes User Guide
MA5850	Rotating Evaporative Thermal Barrier for Heat-treatment of Tubes User Guide
MA3240	Low-height Quench Barriers for Aluminum-solution Processes User Guide
MA5970	TB4626 and TB4633 High-temperature Thermal Barriers for Vacuum Furnaces User Guide
MA5450	Pressure Resistant Monitoring System for Autoclaves Quick Reference Guide
MA5460	Aluminium Brazing in Vacuum Furnaces Quick Reference Guide
MA5930	Compression Glands User Guide
MA0230	First Use of Special Thermal Barriers User Guide
MA5940	TM21 Radio-telemetry System User Manual

BAGS AND CASES

Hard Carry-cases

Robust cases for use with Furnace Tracker systems.

CC0037	For general Furnace Tracker systems.
CC0059	For Furnace Tracker systems with XDL12 logger.
CC0060	For specialist Furnace Tracker systems; incorporates lid organizer. Supplied in yellow.

CC0048   ### Soft Carry-bag

With shoulder strap, for general use.

OneTemp pty ltd
measure | control | record
1300 768 887
www.onetemp.com.au

Fluke Process Instruments