

# ***Nadcap Solutions***

*Instrument and Solution Software for  
Nadcap Pyrometry Applications (AMS2750D)*

LF04L01L90-01E



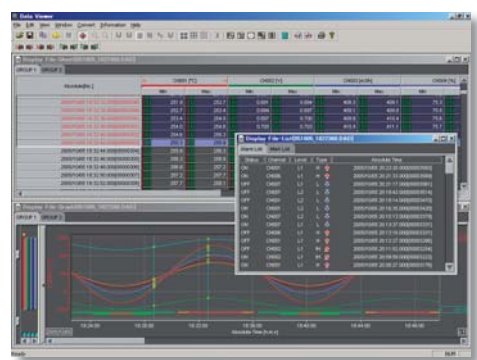
**Nadcap** is the leading worldwide cooperative program of major companies designed to manage a cost effective consensus approach to special processes and products and provide continual improvement within the aerospace industry.

# Video Graphic Recorders (Field Test Instrument, Recording Instruments)

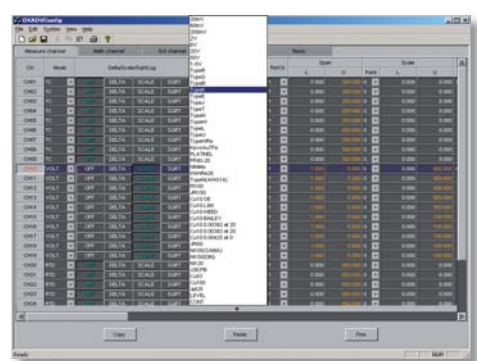
All-purpose recorder for TUS, SAT & process recording.  
TUS Reporting Tool ready to minimize your report work.



**DAQStation DX1000/DX2000**  
Advanced Paperless Recorder



**DAQStandard Viewer Software**  
For analysis, print & conversion



**DAQStandard Configuration Software**  
For configuring online/offline

## Accurate Measurement

- Minimum sensitivity and readability are 0.1 °F and 0.1 °C
  - AMS2750D 3.2.3 Minimum Readability – Test Instruments  
Test instruments shall be digital and have a minimum readability of 1 °F or 1 °C.
  - AMS2750D 3.2.4.1 Minimum Readability – Recording Instruments  
At least one recording and/or controlling instrument for each zone shall have a minimum readability of 1 °F or 1 °C.
  - AMS2750D 3.2.5.5 Sensitivity  
Sensitivity shall be checked during calibration. See Table 3 footnote 4.  
Table 3 footnote 4:  
Class 1 & 2 instruments shall have a minimum sensitivity of 1 °F (1 °C)  
Class 3 through 6 instruments shall have a minimum sensitivity of 3 °F (2 °C).
- 16-point Lineariser function to achieve 1 °F (0.6 °C) accuracy
  - AMS2750D 3.2.5.2 Calibration Accuracy  
Calibration accuracy and frequency requirements shall be in accordance with Table 3.
  - AMS2750D Table 3 Instruments and Instrument Calibration  
Field Test Instruments: ±1 °F (±0.6 °C) or ±0.1% of reading in °F, whichever is greater  
Recording Instrument – Digital instruments: ±2 °F (±1.1 °C)
- Modbus connectivity to receive Controller's data digitally
  - AMS2750D 3.2.4.4 Data Retransmission  
Controlling, monitoring and recording instruments shall receive an unmodified signal from sensors except for analog to digital and digital to analog conversions, or a digitally-processed, error-checked equivalent representation of a direct measured value.

## Electric Data

- Binary-encrypted measurement data files → No way to manipulate
  - AMS2750D 3.2.7.1.1 Electric Record – Manipulation  
The system must create write-once, read only electronic records that cannot be altered without detection.
- Data play-back on instruments as well as on PC (PC software bundled)
  - AMS2750D 3.2.7.1.2 Electric Record – Playback  
The system software and playback utilities shall provide a means of examining and/or compiling the record data, but shall not provide any means for altering the source data.
  - AMS2750D 3.2.7.1.3 Electric Record – Data Output  
The system shall provide the ability to generate accurate and complete copies of records in both human readable and electronic form suitable for inspection, review, and copying.
- Batch header information for controlling data with batch name

## Security

- Log-in authentication: User Name, User ID(optional) & Password
- User-group to control operational access limits
  - AMS2750D 3.2.7.1.5 Electric Record – Data Access  
The system shall provide methods (e.g., passwords) to limit system access to only individuals whose authorization is documented.

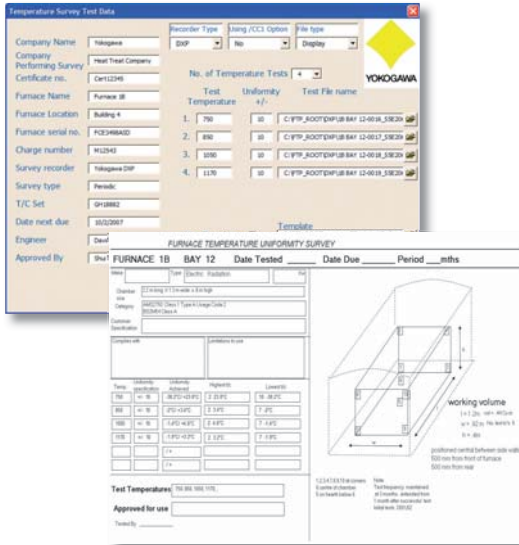
## Other Optional Features

- Logarithmic (LOG) scale, e.g. for vacuum furnace

AMS2750D describes the pyrometric requirements for thermal processing equipment used for heat treatment. There are many requirements surrounding SAT (System Accuracy Test) and TUS (Temperature Uniformity Survey) and the frequency that they have to be carried out. Yokogawa can provide a full range of products including software solutions for SAT, TUS testing and the furnace instrumentation fulfilling the requirements of AMS2750D. Our long term contribution to temperature monitoring and controlling ensures accurate and reliable furnace operation.

# Nadcap Solution

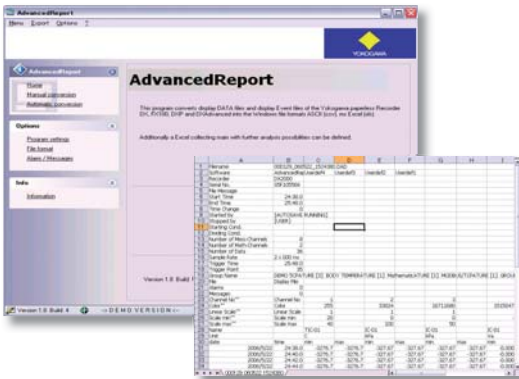
## TUS Reporting Software



Automatic reporting tool produces a comprehensive fully formatted document in-line with the requirements of AMS2750D. The report takes minutes to generate, compared to the hours of work needed to produce the report manually.

- Produces a report based on a number of files from a DXP/DX/DXA from its binary data files. No manipulation.
- Produces Test Data sheet showing all of the test details
- Test Overview gives
  - min/max data per test per T/C (last 30 – 120 minutes)
  - Max overshoot of test per test per T/C
  - Maximum deviation of min/max/overshoot per test + which T/C
  - Pass/Fail based on the uniformity
  - Time taken for 1st T/C in specification to last T/C in specification
  - Out of spec low blue font out of spec high red font
- Caters for number of T/C's and number of tests performed
- User can add template e.g. Furnace layout filled in by the report
- Auto formats each page ready to be printed out

## Process Record Reporting Software



AdvancedReport is the reporting tool for process record. Original binary data from DAQStation can be filled in the form (supports user templates). No need to locate PC online. Report is ready in some minutes.

- Produces a report based on a number of files from a DXP/DX/DXA from its binary data files. No manipulation.
- Supports both automatic and manual conversion
  - Automatic Conversion  
Periodically check the target folder, and generate reports from new data files
  - Manual Conversion  
Users select target data files manually to generate reports
- User can add template, ready to be printed out

## Associated Products



CX1000/CX2000



MX100/MW100

### CX1000/CX2000 (Control and Recording Instruments) Control and Measurement Station

- Paperless recorder with embedded PID controller
- Max 6 embedded loops and max. 16 external controllers
- Visual programmed control
- Carbon Potential computation function (/S35 option)

### MX100/MW100 (Field Test Instrument, Recording Instruments) Online-/Offline-Data Acquisition Units

- Durability design for field use
- Flexible system configuration

# Strip Chart Recorders

(Recording Instruments)



μR10000/μR20000  
Industrial Recorders



DARWIN DR240  
Hybrid Recorder

## Accurate Measurement

- Minimum sensitivity and readability are 0.1 °F, 0.1 °C
- 16-point Lineariser to achieve 2 °F (1.1 °C) accuracy<sup>(\*)</sup>

## Chart Printings

- Flexible Chart Speed
- Digital printing for instant value, good for SAT
- Batch Header Function<sup>(\*)</sup>
- Pen position adjustable by users, to set off expand and contract of chart paper<sup>(\*)</sup>

(\*): μR10000/μR20000

# Temperature Controllers

(Controlling Instruments)



Green series controllers  
Temperature controllers & limiters

## Temperature Controllers

- Support coordinated operation
- Max 300 program patterns, 99 segments per pattern
- "Super" function for overshoot suppression
- "Super2" function to prevent hunting
- Modbus to retransmit control temperature digitally to a recording instrument

## High Limit Devices

- Latching action for control output relay (UT350L)

# Ensure Reliability



Dust-proof and water-proof  
IEC529-IP65, NEMA4  
(DXAdvanced)



YOKOGAWA EMC laboratory

## ASIC as measurement engine



High-breakdown-voltage  
solid-state relays

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**vigilance**<sup>®</sup>

quality

innovation

foresight

What does Yokogawa **vigilance** mean to the future of your business? **Quality**. Through products that are built from the ground up and tested to the last hour, you're ensured continuous operation and more uptime. **Innovation**. Your business will benefit from new insights and capabilities, bringing true predictability to your process. **Foresight**. As the market changes, you'll have solutions that give you the continuity and flexibility to plan ahead and grow. Our partners know the difference. With Yokogawa, you can count on a lifetime of plant efficiency, from instrumentation to operation support. Let us be vigilant about your business.

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Printed in Japan, 708(KP) [Ed: 01/b]