

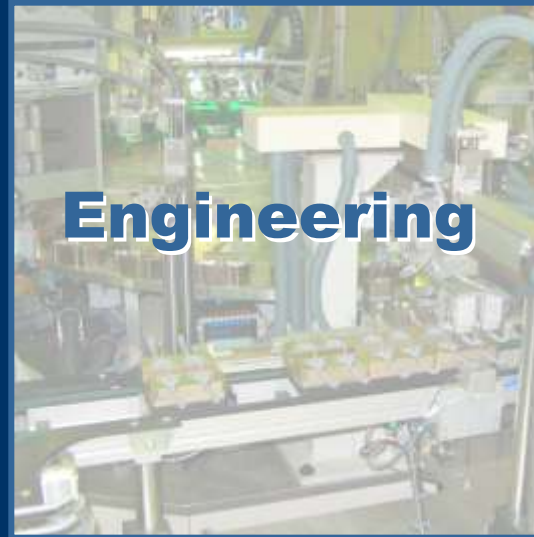


NATIONAL INSTRUMENTS
- Alliance Member -

Datalogging & Traceability

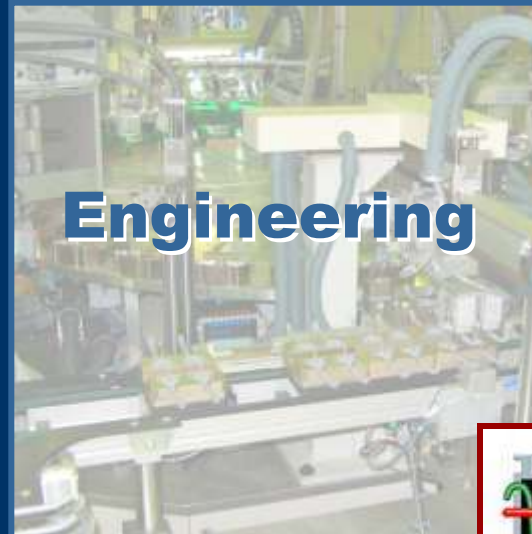


NATIONAL INSTRUMENTS
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**NATIONAL INSTRUMENTS
- Alliance Member -**



Engineering



**Product
Development +
Manufacturing**



Contracting



NATIONAL INSTRUMENTS
- Alliance Member -

**Product
Development +
Manufacturing**

Sensors for automotive industry
(Ferrari, McLaren)

Medical device for rehabilitation

Quality labels



ISO 9001
Quality



ISO 13485
Medical



ISO TS 16949
Automotive

Datalogging and traceability



Professional LabVIEW Development

Disciplined and structured (ISO):

- Strict development according to n-tier (3-tier) model
- reusable framework, version control, official releases...
- Powerful data storage engine

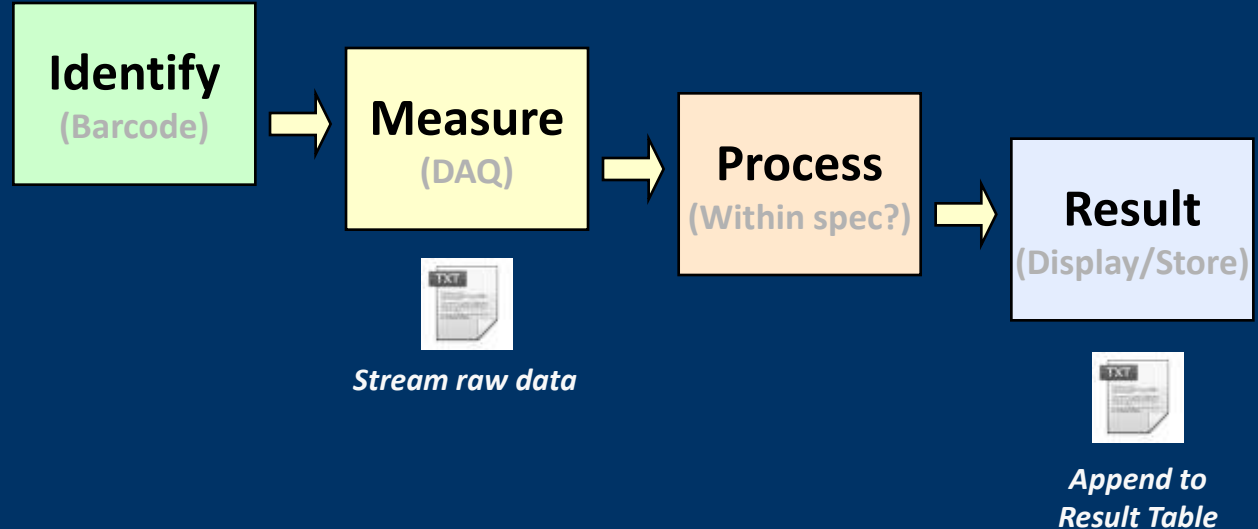
Datalogging & traceability requirements :

1. High speed streaming of raw data
2. Centralized storage of resulting data
3. Full traceability – Error free
4. Data available on LAN – easy to browse

Datalogging and traceability



Manufacturing flow



Datalogging and traceability



TEXT-files

Product	Serial	Date	Batch	Output (V)
NXT-001	nx57954	26/01/09	nb090023	4.99
NXT-001	nx73625	26/01/09	nb090023	4.99
NXT-001	nx13549	26/01/09	nb090023	5.02
NXT-001	nx73541	26/01/09	nb090023	5.00
NXT-001	nx68273	27/01/09	nb090023	4.99
NXT-001	nx19735	27/01/09	nb090023	5.01
NXT-001	nx55701	27/01/09	nb090023	4.98
NXT-001	nx71829	27/01/09	nb090023	4.99
...

Advantages :

- Easy to implement (built-in functions)
- Everybody can read them

Datalogging and traceability



TDMS-files

- A new standard
- Flexible
- Raw data + descriptive properties
- High speed streaming
- Smaller disk footprint
- Open format :
 - Import into MS Excel / OpenOffice Calc
 - DLL available for other applications



Datalogging and traceability



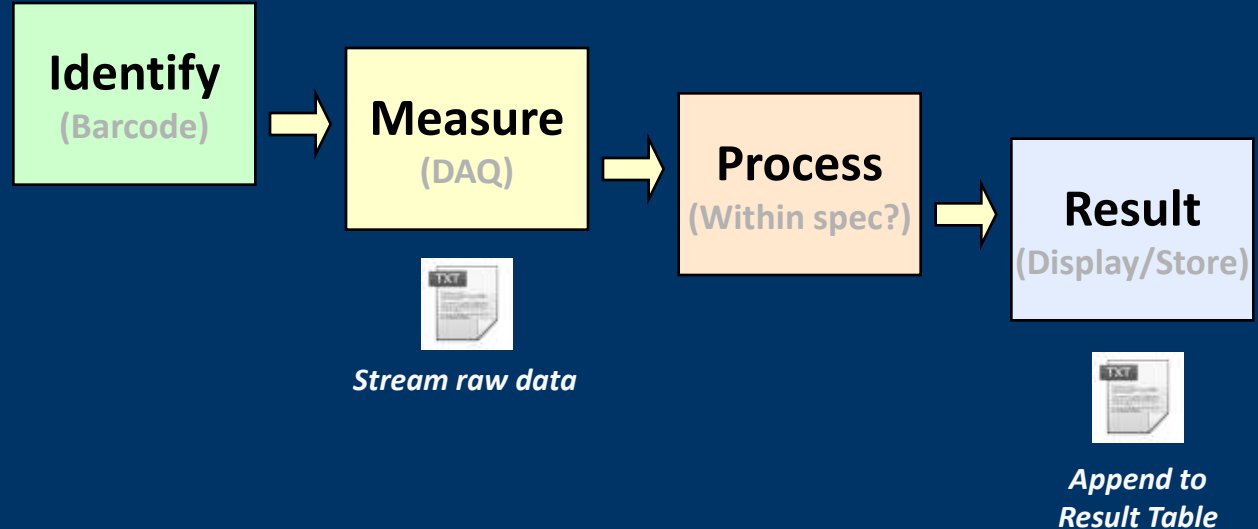
Demo TDMS files

- Performance vs. Text files
- Viewer
- Opening with MS Excel

Datalogging and traceability



Manufacturing flow



Datalogging and traceability



TEXT-files



SQL Database

What you get :

- Integrity
- Performance
- Security / Multiple Users
- Transactions/queries
- Scalability

Datalogging and traceability



TEXT-files



SQL Database

But what about:

- Difficult?
- Extra software investments
- Knowledge of SQL needed

Datalogging and traceability



Choosing a SQL Database

(LabVIEW can talk to any of them)



MS Access



MySQL



MS SQL Server 2008



FileMaker



MS SQL Server Express



Oracle



PostgreSQL



SQLite

-
- *Do you want to make your data centrally available on the network?*
 - *Do you (just) want to embed a database in your stand-alone (local) application?*
 - *Do you need extreme performance?*
 - *Cross-platform?*

Datalogging and traceability



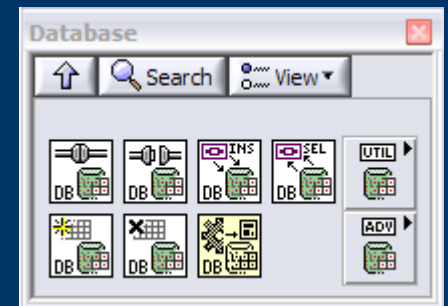
Connecting with LabVIEW to an SQL database

1. Set-up your database (define your tables/users)
2. Install a database-toolkit for LabVIEW
 - NI Database Connectivity toolkit
 - 3rd party toolkits (free)
3. Define a database connection in the ODBC Data Sources Control Panel.

OR (better) :

Connect directly using the right connection string.

(www.connectionstrings.com)



Datalogging and traceability



Demo LabVIEW & databases

- Setting up a database
- Insert data using LabVIEW
- View data using LabVIEW

Datalogging and traceability

SQL database combined with TDMS-streaming



- ✓ Saves time
- ✓ Lots of built-in functionality
- ✓ Easy
- ✓ Very performant
- ✓ Consistent data