

Screenshot COMTRADE Viewer

## Disturbance data storage from digital protective devices

An important function of digital protection is to store disturbance records for more accurate analysis of critical events in the grid. As the memory for such records is limited in the relay it has shown convenient to extract them by use of standardized communication and store them on a hard disk on station level for further use.

Serial communication of digital protective devices to Substation Control Systems has been standardized and published as IEC standard protocol IEC 60870-5-103. Recently the new standard for power utility communication IEC 61850 has added much more flexibility and performance to data exchange with different IEDs by using Ethernet.

The screenshot shows the SICAM DISTO software interface. On the left, there are buttons for 'Config mode' and 'Info mode'. The main window displays a table of disturbance records with the following columns: Date/Time, msec, IV, Name, Fault number, and Status of fault.

| Date/Time           | msec | IV | Name  | Fault number | Status of fault |
|---------------------|------|----|-------|--------------|-----------------|
| 21/05/2008 09:51:31 | 573  |    | 00003 | 3            | 0               |
| 21/05/2008 09:52:48 | 935  |    | 00004 | 4            | 0               |
| 21/05/2008 09:57:59 | 510  |    | 00005 | 5            | 0               |
| 21/05/2008 09:58:26 | 635  |    | 00006 | 6            | 0               |
| 21/05/2008 10:00:52 | 560  |    | 00007 | 7            | 0               |
| 21/05/2008 10:02:53 | 745  |    | 00008 | 8            | 0               |
| 21/05/2008 10:04:37 | 170  |    | 00009 | 9            | 0               |
| 27/05/2008 08:28:44 | 475  |    | 00010 | 10           | 0               |

Screenshot SICAM DISTO

**SICAM DISTO (disturbance data storage)** is a software package, which recognizes the occurrence of new disturbance records in the connected protection relay, fetches them by means of substation communication and stores them in preconfigured directories on the hard disk of a PC. For easy analysis with different tools SICAM DISTO uses the standardized COMTRADE – format for all disturbance files according to IEC 60255-24 (also to IEEE C37.111-1991 and -1997).

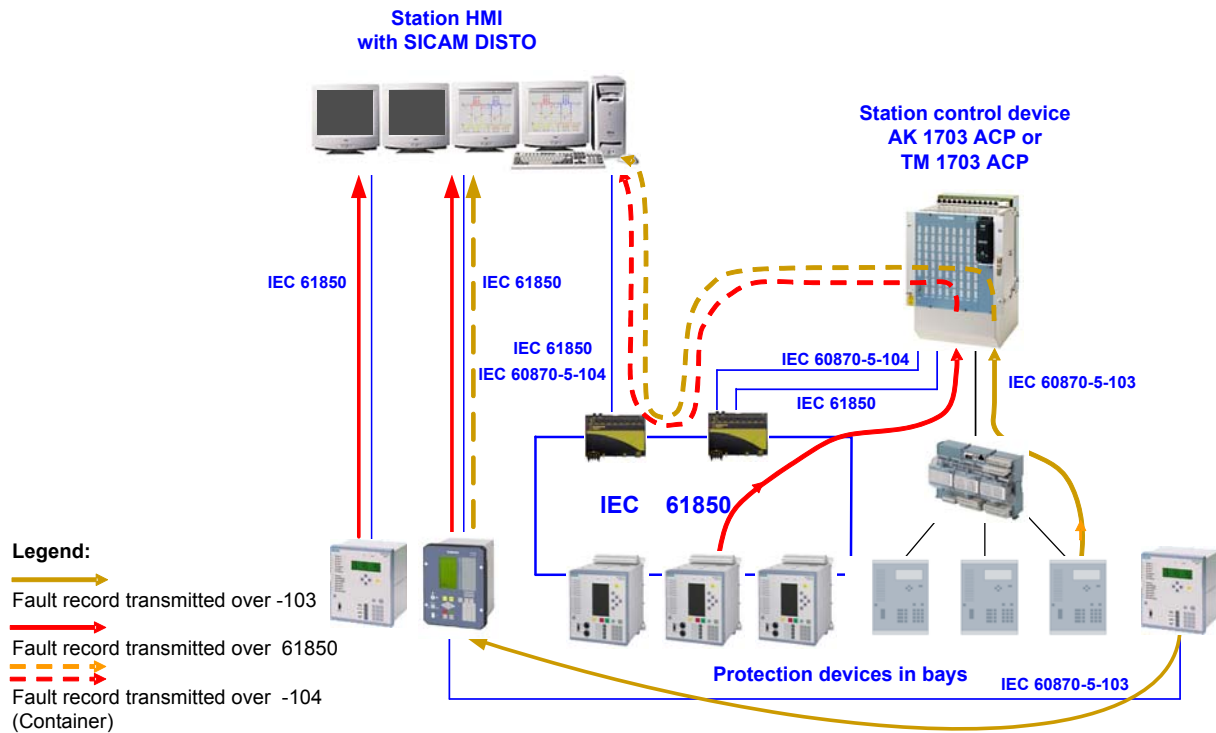
Whereas SICAM DISTO has to translate incoming disturbance records from IEC 103 into COMTRADE, the transmitted files in IEC 61850 are already in the right format.

## SICAM DISTO V2.40

Answers for energy.

**SIEMENS**

**SIEMENS**  
siemens-russia.com



#### Configuration example

The stored files contain the time dependent behaviour of currents and voltages before, during and after a disturbance in the grid, plus additional events (e.g. trips). These data can be displayed as graphs on screen with any COMTRADE Viewer. For easy use a Viewer is included on the CD. The optional software SIGRA offers extended viewing and analysing functions. Additionally SICAM DISTO generates an event log of all information received by IEC 60870-5-103. From version 2.20 on SICAM DISTO can fetch disturbance records both via IEC 61850 and IEC 60870-5-103, this means also in combined configurations.

For accessing the communication to the relays DISTO makes use of SICAM 230 or 250 SCALA and their integrated communication drivers, with an additional component of SICAM 1703 ACP (optional, not used for IEC 61850).

#### Technical data and system limits:

- 1) Supported Operating Systems
  - Win XP Prof. SP3 (32 Bit)
  - Win Server 2003 SP2 (32 Bit)
  - Win VISTA SP1 (32/64 Bit)
  - Win Server 2008 SP1 (32/64 Bit)
- 2) Basic installation needed:
  - SICAM 230, or 250 SCALA
- 3) Protocols:
  - IEC 60870-5-104 with data in IEC 103-container or IEC 61850 client
- 4) Addressing:
  - IEC -103: Nearly unlimited lines (~8 mio), max. 100 IEDs per line . (Recommended max. 20 IEDs per line).
  - max. 4096 IEDs in IEC 61850 LAN

(IED ... Intelligent Electronic Device, represents a relay or a bay controller)
- 5) Disk space limit
  - typical size of file approx 200 kB, depending on number of channels and duration of record
- 6) No redundancy function integrated, but redundant Host system of SICAM 230 or 250 SCALA supported.

