PTS 103

Protocol Test System for IEC 60870-5-103

General

The protocol test system PTS 103 for the "Protection Protocol" IEC 60870-5-103 (also known as VDEW protocol) is a tool for the protection engineer to test and to verify the proper coordination of the protection functions and the messages issued on the communication link.

Features

- Operating modes for monitoring and simulation of either master (primary) or slave (secondary) station,
- Configurable filters for effective capturing and focussed monitoring,
- User configurable plain text interpretations, also for messages of the private range; save / load from CSV files,
- Automatic reading of measurands,
- Saving of captured messages for documentation or later in-depth analysis.

Applications

- Relay testing with simultaneous protocol monitoring,
- Troubleshooting on IEC 60870-5-103 links,
- Commissioning of IEC 60870-5-103 links,
- Receiving fault records from protective relays.

```
REC: Slave -> Master | COM1 | 9600
Tel: 00001   09:46:47.447   spontaneous (1)
CAASDU: 1   general start/pick-up  (F: 128   I: 84)
RT: 08:44:37.127 IV   ON     Rel.time: 0   Fault#: 453

Tel: 00002   09:46:47.497   spontaneous (1)
CAASDU: 1   start/pick-up A  (F: 128   I: 64)
RT: 08:44:37.127 IV   ON     Rel.time: 0   Fault#: 453

Tel: 00003   09:46:47.537   spontaneous (1)
CAASDU: 1   start/pick-up N  (F: 128   I: 67)
RT: 08:44:37.127 IV   ON     Rel.time: 0   Fault#: 453

Tel: 00004   09:46:47.857   spontaneous (1)
CAASDU: 1   trip A  (F: 128   I: 69)
RT: 08:44:37.129 IV   ON     Rel.time: 2   Fault#: 453

Tel: 00005   09:46:47.907   spontaneous (1)
CAASDU: 1   trip B  (F: 128   I: 70)
RT: 08:44:37.129 IV   ON     Rel.time: 2   Fault#: 453

Tel: 00006   09:46:47.947   spontaneous (1)
CAASDU: 1   trip C  (F: 128   I: 71)
RT: 08:44:37.129 IV   ON     Rel.time: 2   Fault#: 453
```

Recorded messages in response to a A-N fault applied to a distance relay displayed in plain text

Benefits to Users

- Filters limit messages to a relevant extent,
- Plain text interpretation of messages, even for messages in the private range,
- Offline analysis of captured messages,
- Reading fault records from relays without dedicated relay software,
- Import of protocol logs into OMICRON Control Center test plans for comprehensive reporting,
- Additional test functionality for IEC 60870-5-101 included.

Monitoring

Monitoring is capturing messages from an established data link between a primary and a secondary station. The PTS 103 remains passive; i.e. it does not generate any messages. With a second serial interface, messages from both directions (Master→Slave and Slave→Master) can be captured simultaneously.

Simulation

In Simulation mode, the PTS 103 performs the active role of either a primary or a secondary station. This is useful during commissioning for setting up data links when the installation is still incomplete or for other testing purposes, like protection testing with a relay alone. Messages relevant for the actual simulation mode (primary / secondary) are either automatically generated or user defined. Messages can then be transmitted individually or as a complete sequence, once or recurring.

Simulation of Primary Station

- Initialization of the data link,
- Polling for measurands,
- Receiving of disturbance data.

Simulation of Secondary Station

- Simulation of cyclic measurands,
- Transmission of disturbance data.

Additional Functionality for IEC 60870-5-101

Since IEC 60870-5-103 is a subset of IEC 60870-5-101, functions for testing this protocol are included. An experienced protocol expert can make use of these functions without restriction. However, OMICRON provides no support for this application of PTS 103.

Accessories

The interface adapter PTS DP1 for connecting to optical fiber communication links is available from OMICRON.