

GPRS Keypoint Integration for Scada Recloser and LBS

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ABSTRACT: In order to maintain continuity and reliability of electricity distribution on the distribution side, SCADA as the backbone of telecommunications between remote devices and the Master side, integrates the SCADA system in every Recloser and LBS in the distribution network. So that Recloser and LBS can be monitored in real time and able to control Recloser and LBS telephonically. With this, the dispatcher can perform functions telemetering, telesignalling, and telecontrolling on Recloser or LBS. A recloser or LBS that has been integrated with SCADA is called Keypoint. GPRS Keypoint is more widely used than Keypoint Fiber Optic because it is more economical and also compatible with the Survant SCADA system. File uplink & downlink must be configured in order for the modem to communicate with the Master Station, vice versa. Commissioning is the integration of SCADA equipment in the field with Master Station. Telecontrol trials and telesignalling are some of the things that must be done during commissioning.

KEYWORDS: Scada, Recliser, LBS, Distribution network.

I. INTRODUCTION

With the increasing human need for electrical energy, PLN as a state electricity company strives to maximize the distribution of electrical energy as optimally as possible. SCADA, which is the backbone of the modern era of electricity distribution, must have equipment reliable equipment. The development of technology and the need for electrical energy that is always increasing from year to year make the SCADA system must continue to develop. In order to maintain continuity and reliability of electricity distribution on the distribution side, SCADA as the backbone of telecommunications between the RTU (Remote

Terminal Unit) and Master Station, integrates the SCADA system in each Recloser and LBS in the distribution network. So that Recloser and LBS can be monitored in real time and able to control Recloser and LBS telephonically. With this, the dispatcher can perform functions telemetering, telesignalling, and telecontrolling on Recloser or LBS. A recloser or LBS that has been integrated with SCADA is called Keypoint. By integrating Keypoint this, is expected to improve SAIDI (System Average Interruption Duration Index)

II. DISCUSSION

a. Definition of SCADA

SCADA (Supervisory Control and Data) is a computer-based industrial control system commonly used in controlling a process. SCADA is also used by PT. PLN (Persero) as a tool control manually controlled devices remote. In general, SCADA functions are divided into three, namely:

- Telemetering
- Telesignalling
- Telecontrolling

b. Equipment & SCADA

The main equipment of the SCADA system includes:

- Master Station
master station is the station that performs the function telemetering, telecontrol, and telesignal to remote another station. master station It is also a place to process and store database, including data that is in the field.

- Remote Terminal Units (RTUs)

Equipment monitored, or ordered and monitored by master station

- Communication media

Communication media used to connect the RTU with the Master Station. The communication media

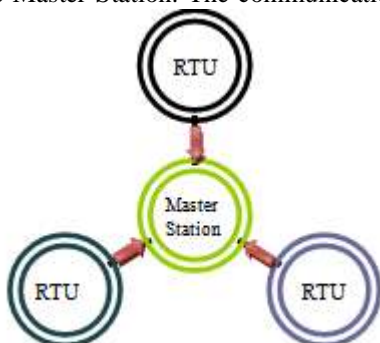


Figure 1. SCADA configuration

c. GPRS Keypoint Integration

Keypoint GPRS is a set of distribution equipment in the form of Recloser or LBS (Load Break Switch) which is integrated with the SCADA system using GPRS communication media. GPRS Keypoint integration means the installation of GPRS Keypoint so that it can be operated from the Master Station.

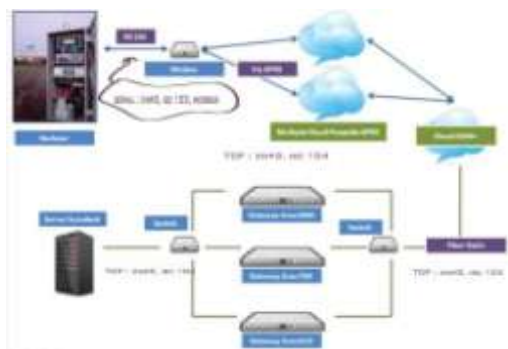


Figure 2. GPRS Keypoint Configuration For Survalent SCADA

d. GPRS Keypoint Structure

A GPRS Keypoint consists of: Recloser or LBS (Load Break Switch)

- ProtectionRelay
- GPRSModem
- Antenna
- PanelBox

e. Procedure of worksteps

Prepare material for GPRS modem installation to Keypoint.

- Do a mapping on the GPRS Modem Before installation (database compilation must pay attention to the type of recloser / lbs).
- Check the GSM Card and Modem connection before installation. Install an

used include Fiber Optic Cable, GPRS, and Radio.

- active GSM Card on the GPRS modem.
- Install the modem on the keypoint with the following procedure:
- Install the antenna on the top outside of the REC/LBS panel box, try to position the antenna in a place that is out of reach and out of sight.
- Attach the antenna connector to the GPRS modem.- Plug the power adapter on the GPRS modem with a 24 Vdc power source taken from the REC/LBS panel.
- Connect the communication cable from REC/LBS to the GPRS Modem.
- Perform parameter settings on the REC/LBS panel so that REC/LBS can communicate with the master.
- After the installation is installed properly, Make sure to do ABSW BYPASS on that keypoint for commissioning purposes.
- Perform commissioning as follows:
- REC/LBS Status and Analog Readout from the master side
- Control Open/Closed REC/LBS experiment from master side
- After commissioning is done, then return it ABSW back to position (BYPASS removed).
- Clean the modem wiring on the REC/LBS panel using Ties. Before leaving
- the premises, make sure the Panel Box is properly closed.

f. Wiring Installation



Figure 3. GPRS Modem Installation Wiring for COOPER FORM 6 Keypoint Panel

g. Files Firmware, Serial number, Database & Configuration

The files that are needed in the modem so that it can run in accordance with device used are as follows:

h. Modbus Protocol & DNP3.0

- 1) Intek.jar
- 2) Intek.jad

- 3)default.cfg
- 4)intek.cfg
- 5)Uplink Database
- 6)Downlink Database

ii.IECProtocol 60870-5-101

- 1)Iec101.jar
- 2)Iec101.jad
- 3)default.cfg
- 4)intek.cfg
- 5)UplinkDatabase
- 6)DownlinkDatabase

i. Technique Commissioning

Commissioning means testing of every equipment installed on site and this activity must be carried out after the installation of new equipment. Commissioning is carried out by means of field officers coordinating with Master Station officers. Commissioning includes: 1. Reading signal strength

j. Statustesting, including:

- 1) Modem to Recloser : Normal / Failed Iffailed, do a power reset and check the serial cable and communication port on the modem and RTU port.
- 2) Master to Modem : Normal / Failed Iffailed, do a GPRS communication check via IP ping test. If the ping test is Dok but stillfailed, check the simcard using a GSM modem, whether the simcard can be read or not.iv. L/R status testing, Lock/Unlock, and alarm reset. (For the SEL 551 brand, it doesn't have L/R and Lock/Unlock features locally on the panel)

i. Telecontrolling Testing

- 1) Coordinate with unit partners and dispatchers whether the condition is safe if ABSW bypass is performed.
- 2) Ask for help from unit partners to bypass ABSW.
- 3) Conducting commissioning of Open and Close control tests with master partners after the bypass position.
- 4) Returns the ABSW bypass position.
- 5) Positioning the RTU in the Remote and Unlock positions.

The Master Station application used for commissioning is SCADA Analog Point Viewer and SCADA Status Point Viewer(Commissioning Display)

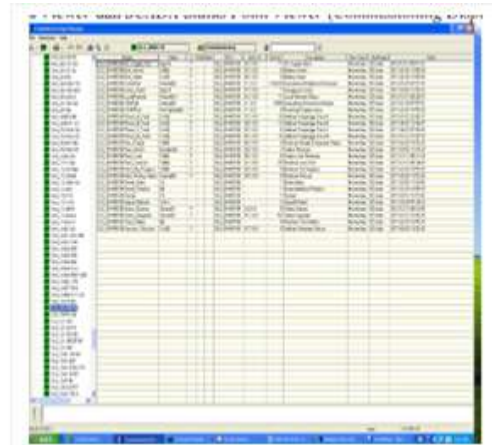


Figure4.SCADAStatusPointViewer(Commissioning Display)

III. CONCLUSION

SCADA is a system related to the supervision of electrical power system equipment. This monitoring includes remote control, real time monitoring, and data transfer. SCADA at PT. PLN (Persero) has 3 main functions, namely telemonitoring, telesignalling, telecontrolling. In general, the configuration is divided into two parts: Master Station and Remote Station or Remote Terminal Unit. Keypoint is a Remote Terminal Unit (RTU). Keypoint is Recloser or LBS that has been integrated into the SCADA system, so that it has telemetering, telecontrolling, telesignalling functions.

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