

KALKI Substation Gateway Family

Second Edition, September - 2005

1. Overview

Kalki Sub-Station Gateway Lite Family of Products enable Utility's to easily and seamlessly modernize their Sub-Station Infrastructure in a systematic and graded manner, without loss of control and monitoring capabilities, with minimal cost implications.

The family of product's support upto 4 Serial and 2 Ethernet Port's, and a maximum of 20000 I/O Points. All KSGGL Family products' come with Device Server Capability as well as Transparent Port Capability.

2. Basic Features

The KSGGL Family of product features include:

- Sub-Station Gateway
- Secure Communications (AES / DES / 3DES / SSL)
- Protocol Conversion

- Data Concentrator
- Device Server / Terminal Server
- Transparent Port for IED
- Parameterization
- PSTN/GPRS/CDMA/RF External
- Modem Support
- Windows Based Common Configuration & Diagnostic Utility

3. Protocol Support

The KSGGL Family Supports the following Protocols by default (Category S Protocols):

- DNP3 Serial Master/Slave
- DNP3 Network Master/Slave
- IEC 61850 Client/Server
- IEC 60870-5-101 Master/Slave
- IEC 60870-5-103 Master/Slave
- IEC 60870-5-104 Master/Slave
- IEC 60870-6 ICCP TASE2 Client/Server
- Modbus RTU Serial Master/Slave
- Modbus TCP Master/Slave
- ABB SPA Master
- ABB RP570 Master
- Alstom Courier Master
- DLMS / IEC 62056
- Custom Protocol Support on request

4. Product Variations

The KSGGL Family Products are as follows:

- KSGGL/S – 2 Serial / 1 Ethernet 10/100 Port, 1000 Points
- KSGGL/S2E – 2 Serial / 2 Ethernet 10/100 Port, 20,000 Points
- KSGGL/M – 4 Serial / 1 Ethernet 10/100, 10,000 Points
- KSGGL/P – 4 Serial / 2 Ethernet 10/100, 20,000 Points

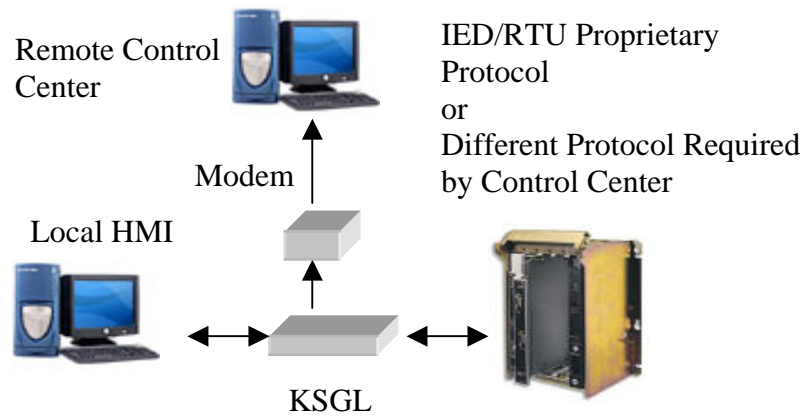
5. Configuration Utility

“**EasyConnect**” configuration utility is used for the configuration of KSGGL. It has got the following functionalities.

- Configuration, Database creation & protocol mapping.
- Diagnostics of the converter with total protocol packet details can be monitored in Easy Connect.
- Miscellaneous functions like restarting, downloading the config files, updating the firmware, IP setting etc can be done from EasyConnect.

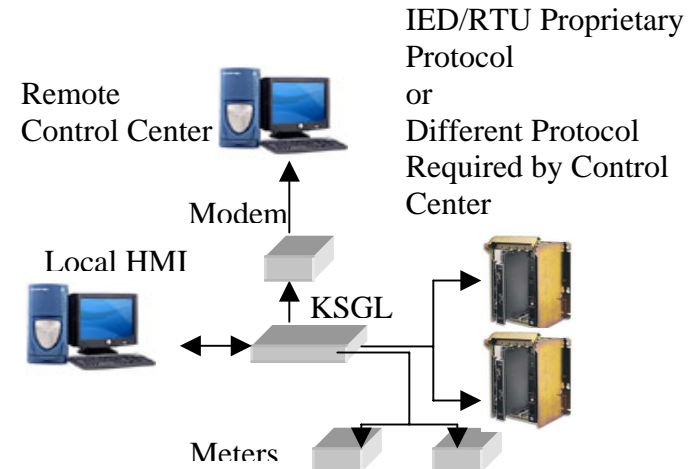
6. Applications

6.1. Protocol Converter



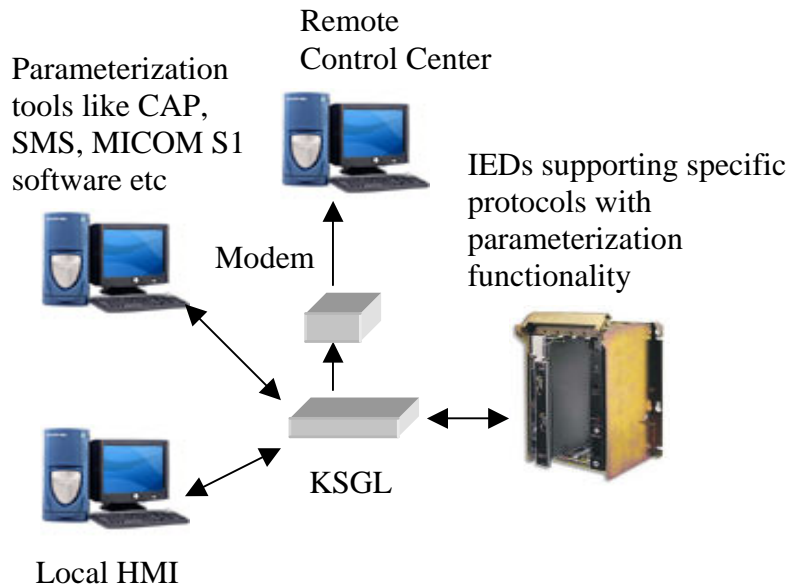
This feature enables the conversions of data from any slave device (protocol –X) to any master device (protocol –Y). KSG L also facilitates one to one, one to many, many to one and many to many conversions. Facility is also given for connectivity to remote control centers through modem. The details of ‘X’ & ‘Y’ protocols available in KSG L are listed in Protocol Support section. (Section 3)

6.2. Sub-Station Data Concentrator



KSG L can act as data concentrator to collect the data from various devices. The external master devices can take the data from KSG L as if they are communicating with the single slave device. KSG L also supports data concentrator feature with protocol conversion functionalities.

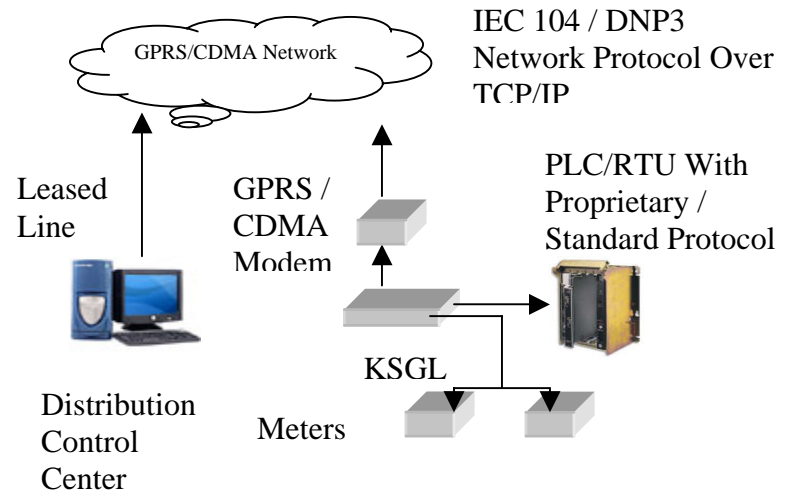
6.3. Protocol Converter with pass-through Functionality



KSG L can have special pass through channels for the parameterization / disturbance uploading functionalities with the IEDs. In this, KSG L will do two major functions parallel.

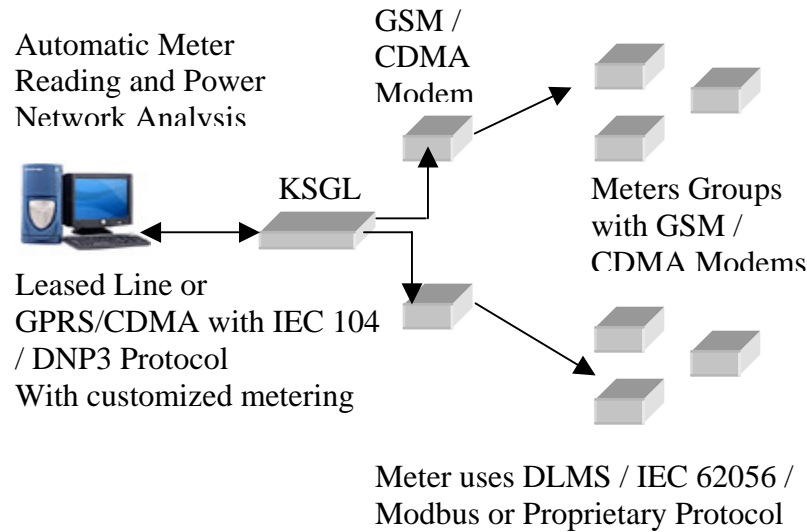
- Convert the normal protection & measurand data from the IEDs to the compatible protocol format required for the HMI
- Passes the messages from transparent channel (parameterization channel) directly to the IEDS.

6.4. RMU / Feeder RTU / Transformer Monitoring and Automation



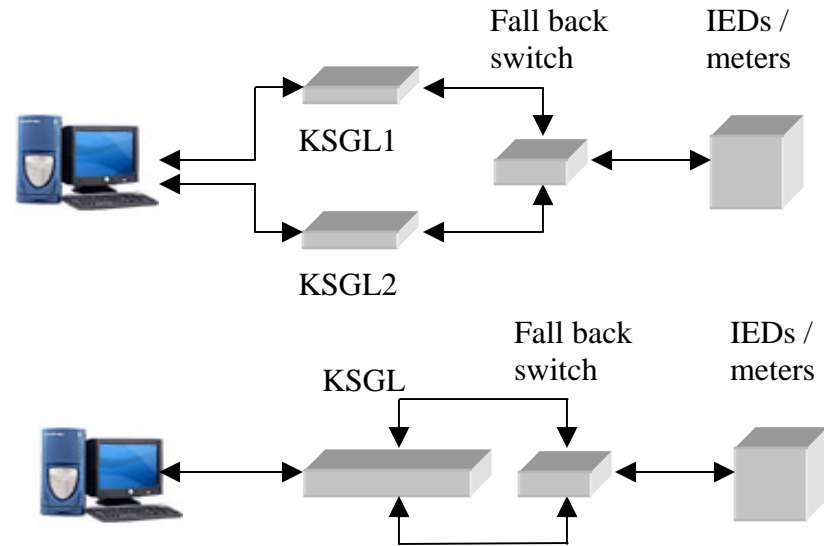
KSG L can collect the data from various devices of the substation and pass the entire data to the distribution control center through GPRS / CDMA modem connectivity.

6.5. Automatic Metering & Management Solutions



KSGM can read the data from meters with GSM / CDMA modems and pass this data to provide automatic metering and power network analysis functionalities.

6.6. Redundant FEPs



KSGM supports redundancy for both the serial & Ethernet connectivity & for all the available protocols. We can have module redundancy or channel redundancy. In module redundancy, switchover takes place between two KSGM modules whereas in channel redundancy switchover takes place between channels in the same KSGM, which are configured as redundant.



KALKI SUB-STATION GATEWAY LITE
Protocol Converter, Gateway and Data Concentrator Family

7. KSGL Specifications

Topic	Feature	KSGL/S	KSGL/S2E	KSGL/M	KSGL/P	Description
Communication	Only RS232		2	3 (#)	3	Supports Only RS232
	RS232/RS485	2 (#)				RS232 and RS485 Selection by external DIP Switch
	RS422/RS485			1	1	RS422 and RS485 Selection by internal Jumper
	Network/Ethernet Port	1	2	1	2	10/100 Support
	Maintenance	Ethernet Port	Ethernet Port	Ethernet Port	Ethernet Port	Using Easy Connect Software
Software Configuration	Configuration, Database Creation and Protocol Mapping	Y	Y	Y	Y	Using Easy Connect Software
	Multi - Protocol Support	Y	Y	Y	Y	Category S Protocol Support, Selectable by Channel
	Master/Slave Mode	Y	Y	Y	Y	Selectable by Channel
	Point Counts	1000	20,000	10,000	20,000	Depends on configuration and protocol
	Diagnostics	Y	Y	Y	Y	Using Easy Connect Software
Applications	Protocol Translator	Y	Y	Y	Y	
	Multi-Port Gateway	Y	Y	Y	Y	Many-To-Many Conversion Support
	Data Concentrator	Y	Y	Y	Y	
	Network Transport & Device Server	Y	Y	Y	Y	Supports Virtual Serial Ports, and Device Server Functionality
	Pass Through Port	Y	Y	Y	Y	Supports Parameterization using existing Software Tools of IED's
Hardware	Processor	ARM7 CPU	Intel XScale	AMD Elan X86	Intel XScale	
	Clock Cycle	55 MHz	533 MHz	133 MHz	533 MHz	
	Power Consumption	6 W	10 W	8 W	10 W	
	Power Supply	24 VDC	24 VDC	24 VDC	24 VDC	
	Temperature (Operating)	-10°-60°	-10°-60°	-10°-60°	-10°-60°	
	Humidity	95% RH	90% RH	95% RH	90% RH	
	Watch-dog timer	Y	Y	Y	Y	
	Activity LED's	Y	Y	Y	Y	
	Mounting	DIN	DIN	DIN	DIN	Optional RACK / Wall Mounting
	RAM	8 MB	64MB	32 MB	64 MB	
	FLASH	4 MB	16 MB	16 MB	16 MB	
	CPU Certification	CE	CE	CE	CE	Complies with European EMC / EMI Regulations
Enclosure Certification	None	CE	CE or Without CE	CE or Without CE	Enclosure's are available with and without CE Certifications	

(#) One RS232 Port do not support Hardware Flow control