

Flex Family

Complete and Reliable Solutions for Digital Transmission and Distribution Substations





Modular, Flexible & Cybersecure Protection IEDs designed to meet the most demanding requirements in each Application Field

HV Lines / Transformers / Busbars and Breakers / Feeders / Motors / Bay Control Applications / Grid Automation

General Characteristics

- ✓ Powerful programable logic.
- ✓ 2000 event log. Up to 100 oscillography seconds.
- ✓ Alphanumeric or graphic display.
- ✓ Up to 20 analog channels, 160 DI, 80 DO, and 22 LEDs.
- ✓ Bonding, RSTP, PRP and HSR Redundancy.
- ✓ IEC 61850 Ed. 2, DNP3, Modbus RTU and PROCOME protocols.
- ✓ Native process bus. Analog input cards operate as Merging Units for the CPU. Synchronized samples at 4800 Hz (as per IEC 61869-9).
- ✓ Cybersecurity in accordance with IEC 62351, IEC 62443 and IEEE 1686-2013 standards. RBAC, secure keys, physical and logical port disabling, cybersecurity event log, securing of management protocols (PROCOME, HTTPS, SFTP, SSH), remote authentication (LDAP, RADIUS) and digital firmware securitization.
- ✓ Time synchronization by IRIG-B, SNTP and PTP (Ordinary Clock / Transparent Clock).

ZIV Flex Family IEDs

- **DBF** Distributed Busbar Protection with Ethernet HSR or PRP Redundant communication between the central and bay units, based on process bus.
- **DLF** Line Differential Protection with Distance Backup. Both units are suitable for lines of any voltage level, overhead or under ground, multiterminal, and single or parallel circuits.
- **IDF Transformer Protection** for two or three winding transformer or autotransformer, of any voltage level, with single or double circuit breaker.
- **IRF** Feeder Protection IED for distribution feeders, transformers and generators, transmission line backup, and BCU (Bay Control Unit for single or double circuit breaker).
- **RTF** Automatic Voltage Regulator for up to 5 power transformers in parallel.
- **ZLF Distance Protection** suitable for lines of any voltage level, single or double circuit breaker with any configuration: overhead or underground, single or parallel circuits.

Making the Smart Grid Real



Applications

Busbar Protection - DBF

The communication between the bay units and the central unit is based on IEC 61869-9 SV and IEC 61850-8-1 GOOSE. The bay units are synchronized by PTP IEC 61850-9-3. The **DBF** can be applied to any substation configuration, with up to 4 busbars, including two transfer busbars, with up to 4 ties, with simple and double CT and with up to 24 bays. The bay units, not only operate as SV publishers and GOOSE publishers / subscribers but they can also be used as Protection and Control IEDs, as they can run the protection functions of a feeder relay. This makes this solution very cost-effective for MV busbar differential protection.

Line Differential Protection · DLF

The **DLF** model includes all the protection, control and measurement functions for a power line with or without Series Compensation, Single Breaker, and Single or Three Pole Tripping. The fast Differential Unit, complemented by the External Fault Detector and the Capacitive Current Compensation unit, protects lines with up to 3 terminals, even with a transformer in the protection zone, providing excellent reliability even in the most adverse conditions.

DLF IEDs combine the Differential protection units with Distance metering elements (and complementary units such as Close-onto-Fault, Dead-Line, Remote Breaker Open, VT Fuse Failure, Power Swing and Load Encroachment detectors), Over / Undervoltage and Over / Underfrequency protection, Recloser, Synchronism Supervision, Control and Metering functions.

Automatic Voltage Regulator · RTF

Parallel transformer regulation by master-slave, circulating current and negative reactance methods. Also includes line voltage drop compensation.

Feeder Protection · IRF

The **IRF** is applicable in any substation scheme. The protection functions are suitable for any neutral configuration, solid-grounded, resistor-grounded, Petersen coil compensated, and isolated.

The powerful programmable logic features selectable execution times according to the required priority (2 ms, 10 ms and 20 ms). Includes many digital and analog operators, which allows the creation of complex protection and control functions.

Transformer Protection · IDF

Suitable for phase-shifting transformers, Scott or Leblanc transformers, can be applied as a differential protection for reactances, SVCs, generators and motors.

A fast differential unit, complemented by advanced blocking and harmonic restraint logics and an external fault detector, provides great reliability in all types of conditions.

Distance Protection · ZLF

The **ZLF** includes all the protection, control and measurement functions for a power line, with or without series compensation and single pole or three pole tripping.

Eight distance zones with Mho or quadrilateral characteristic, complemented with load encroachment and power swing, fuse failure, close onto fault, and saturation detectors provide great security and dependability even in the most adverse conditions.

The distance and overcurrent units can operate according to the following schemes: DTT, PUTT, POTT, DCUB and DCB. Weak infeed logic and current inversion blocking are also included.

Substation Automation



Parque Tecnológico de Bizkaia, 210 - 48170 Zamudio, Spain. Tel.: +34 944 522 003 Fax: +34 944 522 140. E-MAIL: ziv@zivautomation.com Please visit our website for local information in your area www.zivautomation.com