

InteliPro

Protection Relay for Parallel Applications

Technical Specification



ComAp is a member of AMPS (The Association of Manufacturers of Power generating Systems).



ComAp products meet the highest standards, with every stage of production undertaken in accordance with the ISO certification obtained in 1998.



Product description

InteliPro is a highly flexible interconnection/mains decoupling protective relay with extensive protective functions. It meets the strictest utility interconnection requirements and can be used in wide range of distributed generation applications such as Photovoltaics, Wind, Fuel Cell, Bio Mass, Combined Heat and Power, etc.

Plus, the advanced communication capability, including remote monitoring/control via web browser, active SMS, e-mail messaging and data/event logging, makes InteliPro an excellent choice for remote controlled/monitored installation.

Protective functions

InteliPro provides all necessary protective functions required by utilities. It offers the option to add other functions to extend the functionality range and make InteliPro perfectly suitable for particular applications.

To ensure an appropriate selectivity, two adjustable stages of over/undervoltage, over/underfrequency, directional power, overcurrent and neutral voltage displacement are provided.

Certificates and Standards

InteliPro is designed to comply with the following statutory codes:

- ▶ IEC 60255
- ▶ G59/3, G10, G83
- ▶ IEEE 1547
- ▶ VDE V 0126-1-1
- ▶ UL 508
- ▶ BDEW

Programing and Setting

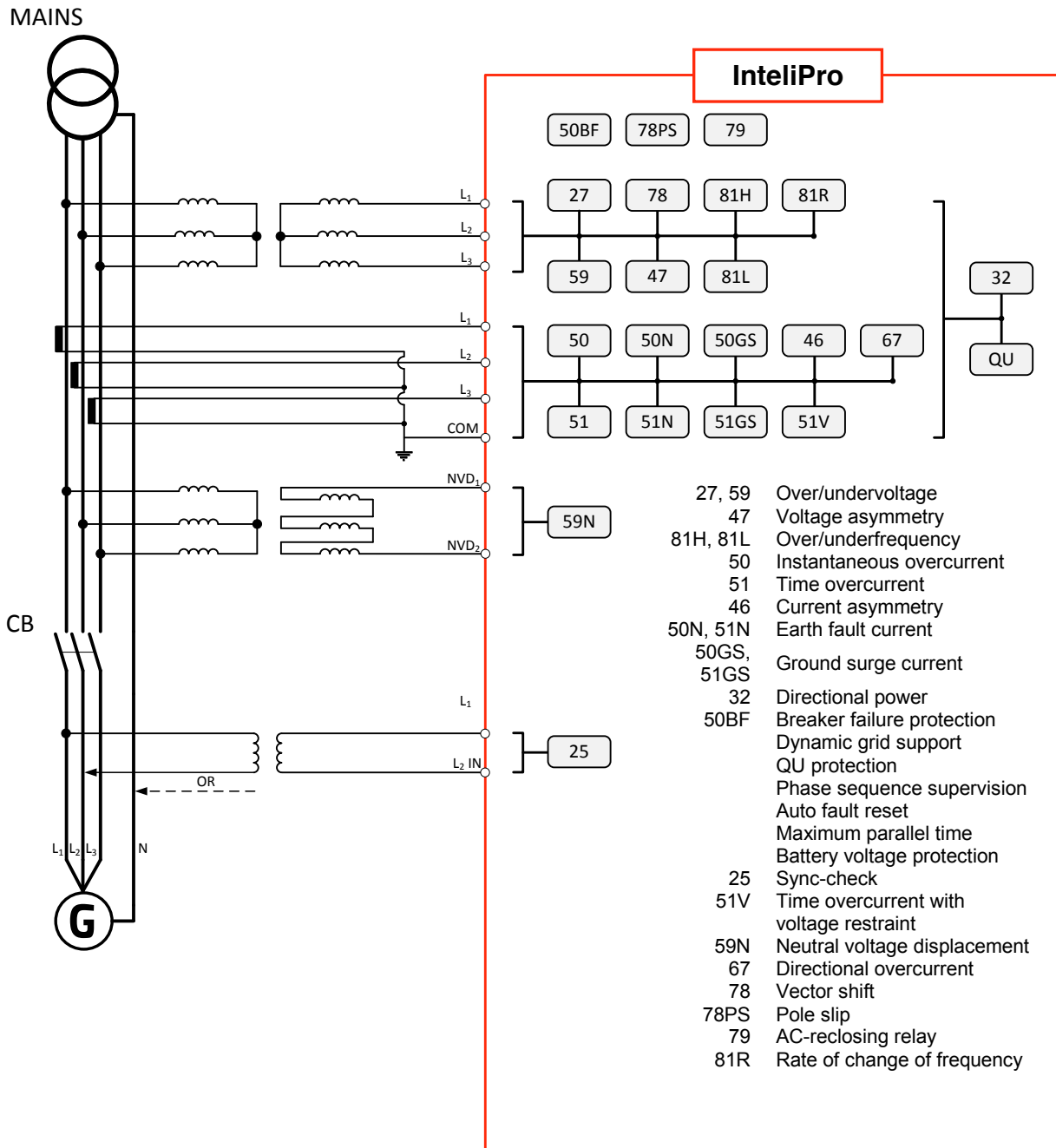
InteliPro is fully configurable via ComAp PC software LiteEdit or simply via keyboard.

Basic functions	ANSI
Under/overvoltage	27, 59
Voltage asymmetry	47
Under/overfrequency	81L, 81H
Instantaneous overcurrent	50
Time overcurrent	51
Current asymmetry	46
Earth fault current	50N, 51N
Ground surge current	50GS, 51GS
Directional/reverse power with time delay	32
Breaker failure protection	50BF
Dynamic grid support	
QU (Reactive power undervoltage) protection	
Phase sequence supervision	
Auto fault reset	
Maximum parallel time	
Battery voltage protection	

Optional functions	ANSI
Sync-check	25
Time overcurrent with voltage restraint	51V
Neutral voltage displacement	59N
Directional overcurrent	67
Vector shift	78
Pole slip	78PS
AC-reclosing relay	79
Rate of change of frequency + rocof filter	81R

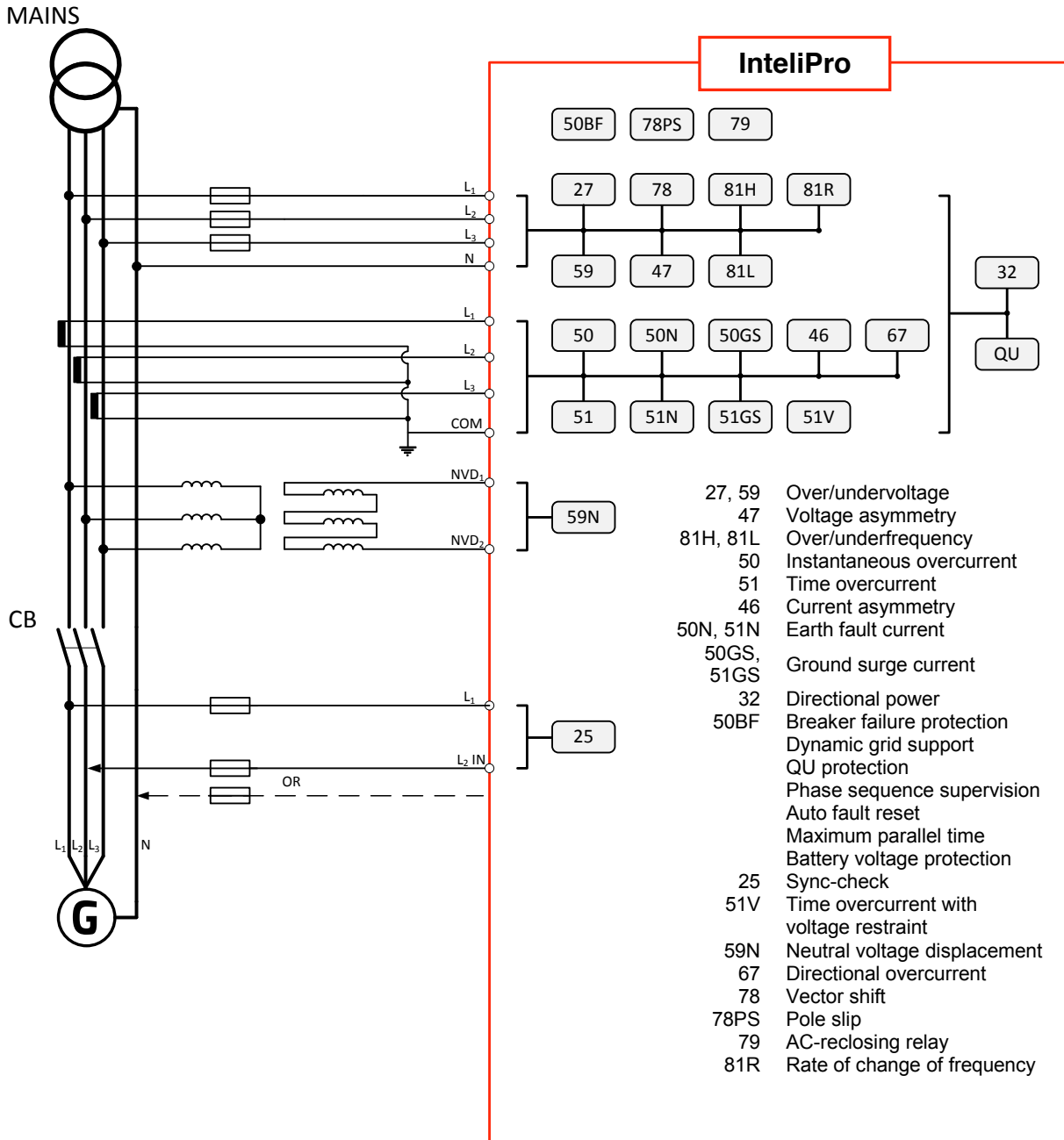
Wiring of IntelliPro with potential transformers

In case the nominal voltage of the generator is higher than 400 V phase-to-phase potential transformers have to be used.



Wiring of IntelliPro without potential transformers

In case the nominal voltage of the generator is up to 400 V phase-to-phase no potential transformers are needed and connection with fuses is sufficient.



Communication

There is one **CAN Bus** for communication with extension modules and one **CAN Bus** intended for internal communication with controllers. Plus, there is a wide range of plug-in communication modules which can be inserted to IntelliPro and thus provide a connection from remote sites:

- ▶ **IB-Lite** – Internet/Ethernet Module including Web Server (ModBus/TCP protocol)
- ▶ **IL-NT RS232** – Module for serial communication
- ▶ **IL-NT GPRS** – GSM/GPRS Modem Plug-In Module
- ▶ **IL-NT RS232-485** – Dual port module with RS232 and RS485 interfaces at independent COM channels
- ▶ **IL-NT S-USB** – Easily removable plug-in communication module with USB device interface

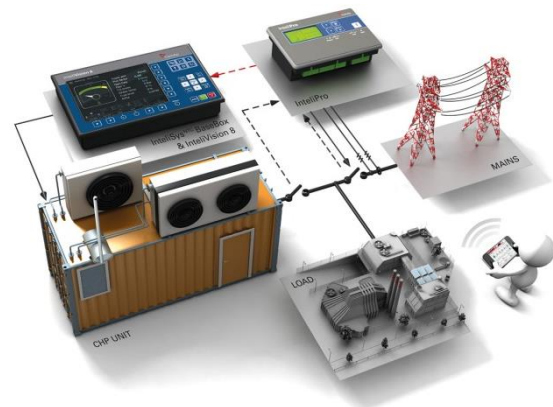
IntelliPro also supports ComAp advanced communication technologies as AirGate and WebSupervisor.



Extension Modules

To provide more inputs and outputs, there are following extensions input/output modules available:

- ▶ **IC-NT CT-BIO7** – 1 phase current input and binary input/output module
- ▶ **IG-IOM** – Analog/binary input/output module
- ▶ **IGS-PTM** – Analog/binary input/output module
- ▶ **IL-NT-AIO** – Analog input/output module



Technical data

Power supply

Power supply range	8-36 VDC
Power supply drop-out immunity	50 ms (from min. 10 V)
Power consumption	200 mA/8 V 50 mA/36 V
Backup battery type	CR 1225
Estimated backup battery lifetime	10 years

Operating conditions

Operating temperature	-20... 70°C
Operating humidity	95% non-condensing IEC/EN 60068-2-30
Protection degree (front panel)	IP65
Vibration	5-25Hz, +/- 1.6mm 25-100Hz, a = 4g
Shocks	a_{max} 200m/s ²
Storage temperature	-30... 80°C

Mains measurements

Measurement inputs	3 phase mains voltage 3 phase mains current
Measurement type	True RMS
Voltage range	480 V Ph-Ph (277 V Ph-N)
Max. measured voltage	340 V Ph-N
Voltage accuracy	1% from the range at 20°C and 50 or 60 Hz; 1,5% on the complete frequency and temperature range
Current range	5 A
Max. measured current	9 A
Max. allowed current	12 A continuous, 50 A/1 s
Current accuracy	2 % from the range at CT Ratio = 50 A/5 A or higher
CT input burden	<0.5 VA
Frequency range	30-70 Hz, measured from L3
Frequency accuracy	0.05 Hz

NVD and Sync Check measurement

Measurement inputs	NVD voltage Sync Check
Measurement type	True RMS
Voltage range	NVD: 277 V Sync Check: 480 V
Min. measured voltage	Sync Check: 30 V
Max. measured voltage	NVD: 340 V Sync Check: 589 V

Binary inputs

Number of binary inputs	9
Galvanic insulation	Not insulated
Common pole	Positive, $V_s = 8-36$ VDC
Closed contact voltage	<2 V
Open contact voltage	4 V - V_s
Input resistance	4,2 kΩ

Binary outputs

Number of binary outputs	8
Galvanic insulation	Not insulated
Type	Transistor; switching to negative supply terminal
Operating voltage	8-36VDC
Switching current	500 mA

Analog inputs

Number of analog inputs	3
Galvanic insulation	Not insulated
Electrical range	0-2500 Ω
Resolution	10bits, 4digits
Supported sensor types	Predefined: VDO 10 Bar VDO Temperature VDO Fuel level User defined: 10 points non-linear sensors can be defined by the user
Precision	1% from the range

Relay card CT2-REL2

Relay card CT2-REL2 is a plug-in module which is delivered as a part of IntelliPro by default.

Relay contacts

Number of relay outputs	2
Type	Dry contacts
Operating voltage	250 VAC
Max switched voltage/current	250 V/10 A
Current measurement inputs	2 x 1ph current measurement
Measurement type	True RMS
Number of current inputs	2

Input 1 (CT k1, I1):

Current range	50 mA
Max. measured current	90 mA
Max. allowed current	120 mA
Current accuracy	2 % from the range

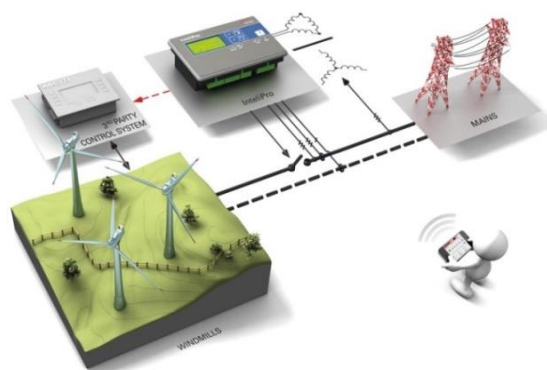
Input 2 (CT k2, I2):

Current range	5 A
Max. measured current	9 A
Max. allowed current	12 A continuous, 50 A/1 s
Current accuracy	2 % from the range
CT input burden	<0.5 VA

EMC

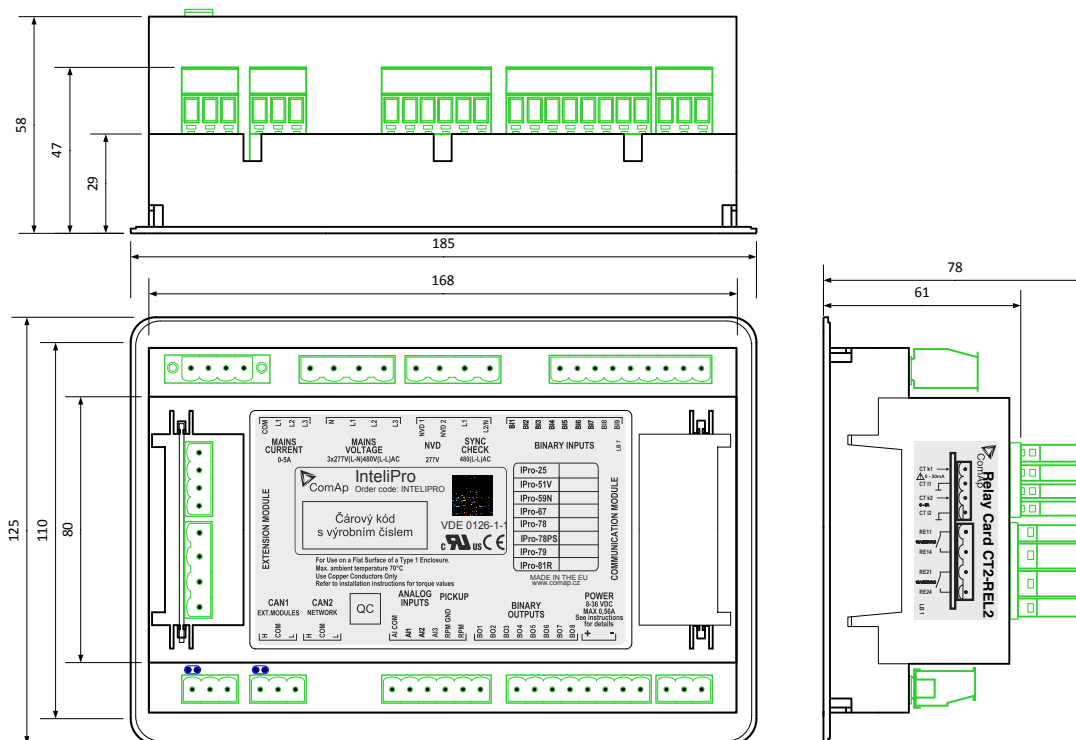
Electrical disturbance test (1MHz burst immunity)	IEC 60255-22-1 IEC 61000-4-18 IEEE C37.90.1
Electrostatic discharge tests	IEC 60255-22-2 IEC 61000-4-2
Radiated electromagnetic field immunity test	IEC 60255-22-3 IEC 61000-4-3 IEEE C37.90.2
Electrical fast transient/burst immunity test	IEC 60255-22-4 IEC 61000-4-4 IEEE C37.90.1
Surge immunity tests	IEC 60255-22-5 IEC 61000-4-5
Immunity to conducted disturbances induced by radio – frequency fields	IEC 60255-22-6 IEC 61000-4-6 IEEE C37.90.2
Power frequency magnetic field immunity tests	IEC 60255-22-8 IEC 61000-4-8
Voltage dips, short interruptions and voltage variations on dc input power port	IEC 60255-11 IEC 61000-4-29

Electromagnetic emission tests	CISPR 22 IEC 60255-25
Vibration tests (sinusoidal)	IEC 60255-21-1 IEC 60068-2-6
Shock and bump tests	IEC 60255-21-2 EN 60068-2-27
Environmental testing (Cold: -30 °C)	IEC 60068-2-1
Environmental testing (Dry heat: +70 °C)	IEC 60068-2-2
Environmental testing (Temperature cycle: 20-55-20°C Humidity: 97%)	IEC 60068-2-3 IEC 60068-2-30
Insulation coordination (Overvoltage category III)	IEC 60255-5



Dimensions and Mounting

InteliPro is to be mounted on a switchboard door. The dimensions are stated in [mm].



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