Product Data-Sheet

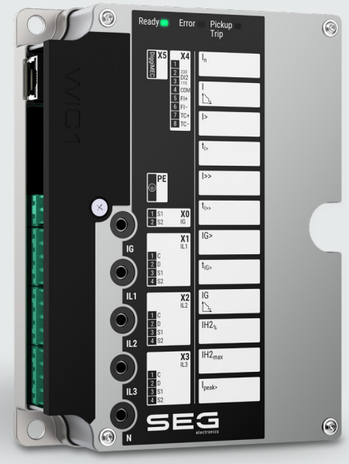
SEG electronics

WIC1 g2

Self-powered Protection Relay

Protect what you value.

WIC1 g2.
Ultra fast. Ultra safe. Ultra reliable.



The WIC1 family is a series of self-powered / CT powered protection relays, designed for harshest environments. The WIC1 relay family does not need auxiliary power since they are CT powered. A dual/ redundant powered variant enables communication options in addition to the power outage safe protection core. The main applications are:

- Protection of Ring Main Units, for Power Distribution
- Protection of Step-Up Transformers e.g. for Wind and Solar Power
- Protection of Feeders
- Current based protection when auxiliary power is not available or too costly
- Backup Protection – available in absence of auxiliary power
- Disaster recovery – Blackstart capability after (short or long lasting) outages – reliable protection, when other protection relays fail because of depleted UPS

Product Feature Highlights

Minimum Start Current

0.25 In,min [3-phase]

Start current [0.35 In,min - 1-phase]

For Harsh Environments

-40 / +80 °C

Temperature Range[1]

Protection Function

IH2

Inrush Blocking

Robust Design

Aluminum EMC

Durable Housing

Protection Function

Ipeak>

Peak Overcurrent Detection

Maintenance

25 Years

Maintenance free

[1] WIC1-4 -40/ +60°C

Many great Features

Self-Powered device

No auxiliary power needed. The WIC1 g2 relays are powered by the current measurement signals.

Dual-Powered variant

A dual powered variant is available in order to enable e.g. communication and early ground (earth) fault detection.

Ultra Fast Boot-up time

With a start-up time of less than 1 cycle, the WIC1 g2 already protects your equipment whilst other devices are still booting. What if someone is switching onto a fault although the system is still grounded during maintenance? The WIC1 g2 will issue a trip signal almost immediately.

Ultra Fast Peak Value Overcurrent

The WIC1 g2 can trip on critical currents within less than a cycle, including boot and charge time. This element can be used to minimize damage to your equipment in case of very high short circuit currents or to minimize SOTF (option) tripping times.

DIP / HEX Variants, for manual Individual parameterization

Simple and classic - the configuration is done manually via the DIP or HEX switches, no additional software needed.

Custom parameterization

With the WIC1 g2, you have all the options to configure the system according to your individual requirements. Conveniently via the “Smart view” software (Smart view is the free software by SEG Electronics for easy configuration and evaluation), via DiggiMEC, or traditionally manually via DIP/HEX switches.

Self-Supervision

The protection devices apply various check routines during normal operation and during the start-up phase to supervise themselves for faulty operation. There are different options available for using the self-supervision function (see the order form for Backup Protection/Self-Supervision).

Ground Overcurrent Protection

The WIC1 offers calculated and measured 1 A ground overcurrent protection (option).

Made for Harsh Environment

It is no problem for the WIC1 if the RMU / transformer is in an area with harsh climate, for example high humidity all the year, or an average temperature above 50°C.

Retrofit - No Drilling, no Sawing

The WIC1 g2 has the same form-factor as our predecessor. You can mount it into the cabinet in just a few minutes. No cabinet needs to be redesigned. No drilling, no sawing will be necessary. You can re-use the previously installed WIC1 CTs: Just switch over the connection cables. The first DIP switch blocks (WIC1-2) / HEX switches (WIC1-3) have the same function as the first WIC1 version, so that the settings are quickly copied.

Compact design – small dimensions

The WIC1 features a compact design, measuring only 125 x 170 mm, and therefore requires minimal space.

DiggiMEC® - Nano-HMI with up to three integrated mechanical flag indicators

The DiggiMEC® is an upgrade option to the WIC1 family. It offers access to all or additional protective functions via USB-C. It also features integrated Flag Indicators, binary outputs and configurable LEDs.

Four variants - all possibilities.

Four WIC1 g2 device variants are available to meet a wide range of requirements.

Energy efficient.

The WIC1 g2 requires extremely little energy, with power consumption in the milliwatt range.

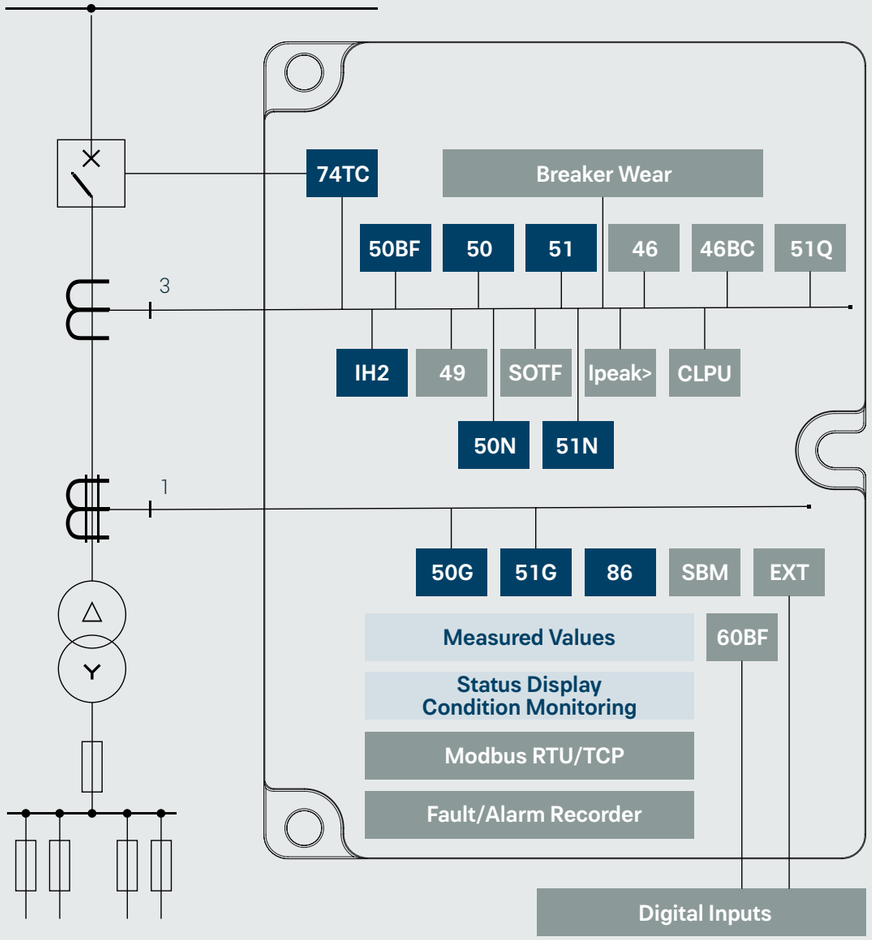
Full control, with ease – Intuitive configuration with our free Parameter setting and evaluation software “Smart view”

“Smart view” offers convenient ways to do all configuration work, reading and evaluating measuring values, fault analysis via fault recorder, and much more.

System Functional overview

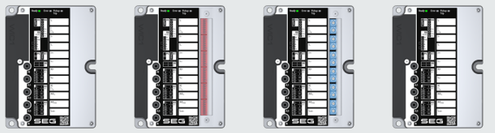
Simple but safe wiring, high electromagnetic interference immunity, uncomplicated adjustment and the ability to scale to different power quantities of the switchboard, helping the switchgear manufacturer to minimize costs.

System Overview:



- Standard
- Option (Depending on the selected available function package)
- with DiggiMEC® or via PC4-Adapter with „Smart view“

Device Features



Depending on variant and choosen software fuction package

Base | DIP | HEX | Dual-Powered

Primary Application Type	Self-/CT-Powered / WIC1-4 with optional auxiliary power supply	
Mounting Type	Housing suitable for mounting plate	
Inputs and Outputs		
Current transformer inputs	3 phase currents	
	1 ground current	
Digital inputs	0/1 (option – supported voltage: 110 VAC or 230 VAC – only on WIC1-1 / WIC1-2 / WIC1-3)	
	0/2 (option – supported voltage: wide range AC/DC from 24V up to 230V* – only on WIC1-4)	
Pulse Output	2 (1 Flag Indicator Pulse Output; 1 Trip Coil Pulse Output)	
Auxiliary power supply	WIC1-1 / WIC1-2 / WIC1-3: None	
	WIC1-4: 24-250VDC or 48 -230VAC	
Protection and Supervision Features		
Protection		
	ANSI / IEEE C37.2	**IEC**
Time overcurrent protection	50 / 51	I>, I>>, I>>>
Inrush stabilisation (2nd harmonic)	IH2	IH2
Calculated ground (earth) fault protection	50N / 51N	IG>, IG>>
Measured ground (earth) fault protection	50G / 51G	IG>, IG>>
Ultra-fast Peak Overcurrent protection		Ipeak>
Unbalanced Load protection	46	I2/I1>
Negative-Sequence Current Protection	51Q	I2>
Thermal Overload protection	49	ThR
Switch on to Fault (SOTF)		SOTF
Cold Load Pickup (CLPU), only WIC1-4		CLPU
External Trip		ExP
Supervision		
Circuit breaker failure	50BF	CBF
	62BF (only WIC1-4)	
Breaker Wear		Breaker Wear
Trip circuit monitoring	74TC	TCM
Supervision of the Station Battery (only WIC1-4)		SBM
Condition Monitoring		
Peak Current Pointer		Peak Current Ptr
Life Load		Life Load
Recorders		
	ANSI / IEEE C37.2	**IEC**
Fault recorder (non-volatile)	DFR	
Self-Supervision logging		
(messages about device-internal		
events – non-volatile)		
Communication		
SCADA (only WIC1-4)	Modbus RTU	
	Modbus TCP	

Three function packages - for maximum flexibility.

To meet various requirements, we offer three function packages to choose from: “Standard”, “Advanced”, or “Professional”.

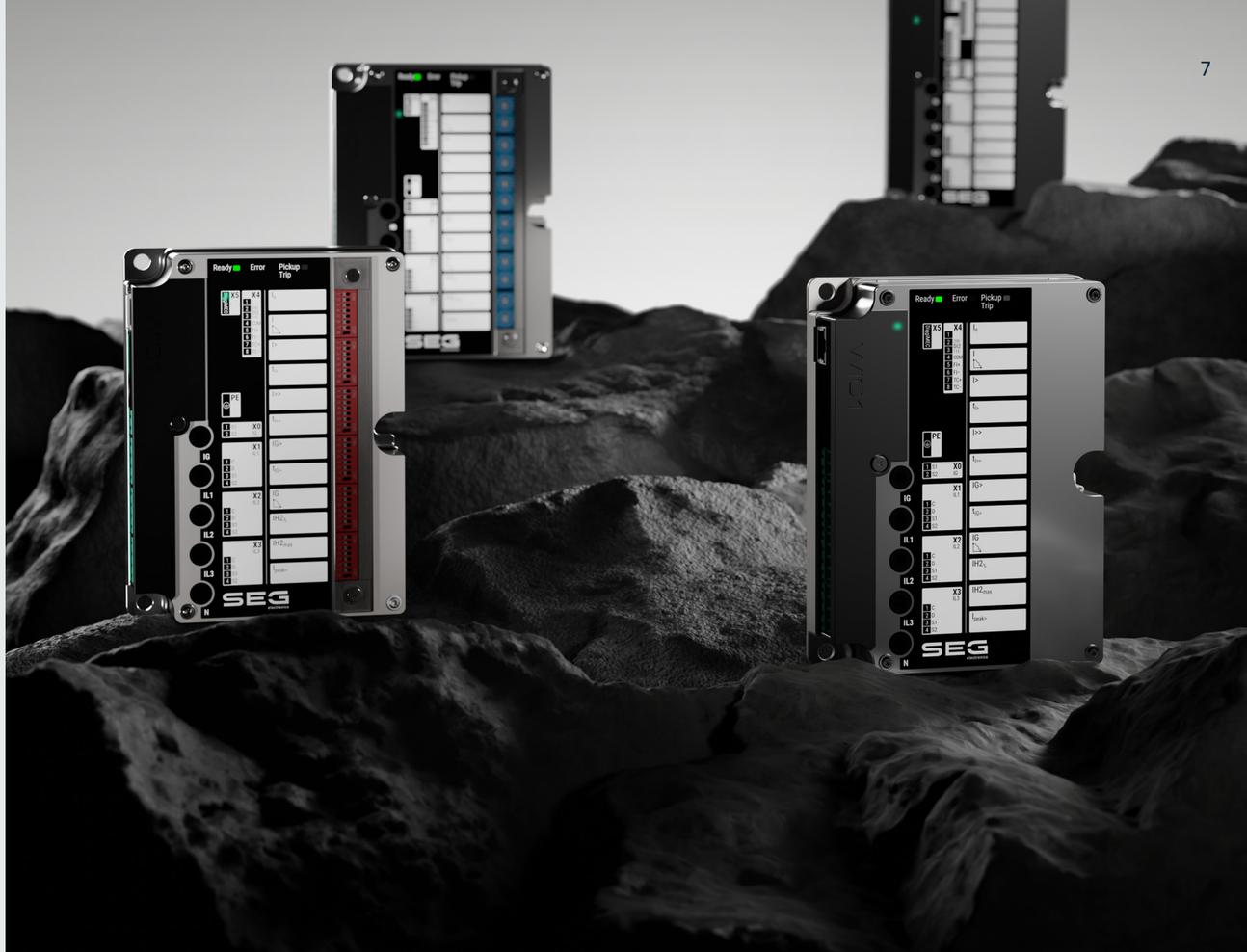
See this overview for the functions included in each package. For pricing, please contact our sales team directly. We look forward to providing you with a quote.

Function Name	IEC	IEEE Device No	Function package		
			Standard	Advanced	Professional
Phase Overcurrent Protection	I>	50,51	●	●	●
Phase Overcurrent Protection	I>>	50,51	●	●	●
Phase Overcurrent Protection	I>>>	50,51	●	●	●
Earth (Ground/Neutral) Overcurrent Protection	IG>	50N/G; 51N/G	●	●	●
Earth (Ground/Neutral) Overcurrent Protection	IG>>	50N/G; 51N/G	●	●	●
Station Battery Monitoring (only WIC1-4)	SBM		●	●	●
External Protection (external Trip)	ExP[1]		●	●	●
Inrush Blocking	IH2		●	●	●
Fault Simulator	Sgen		●	●	●
Circuit Breaker Failure Protection	CBF	50BF	●	●	●
(only WIC1-4)		62BF	●	●	●
Trip circuit monitoring	TCM	74TC	●	●	●
Unbalanced Load Protection	I2/I1>	46	—	●	●
Negative Sequence Current Protection	I2>	51Q	—	●	●
Thermal Overload Protection	ThR	49	—	●	●
Breaker Wear Monitoring	BkrWear		—	●	●
Life Load Monitoring	LifeLoad		—	●	●
Peak Overcurrent Protection	Ipeak>		—	—	●
Switch onto Fault Protection	SOTF		—	—	●
Cold Load Pickup (only WIC1-4)	CLPU		—	—	●
External Protection (external Trip), only WIC1-4	ExP[2]		—	—	●

● Included — Not included

Do you have questions about the function packages? Or need assistance in selecting the right solution for your needs? Please feel free to contact us directly.

Built to last – The WIC1 g2 offers maximum protection, even under extreme conditions.



Additional System Components

The WIC1 g2 is optimized for operation with specially designed, highly efficient CTs developed by SEG. If the use of 1 A (or 5 A) standard current transformers is mandatory (for technical or historical reasons), it is possible to connect the WIC1 to standard current transformers using adapter CT. Below is an overview of the available optional components:

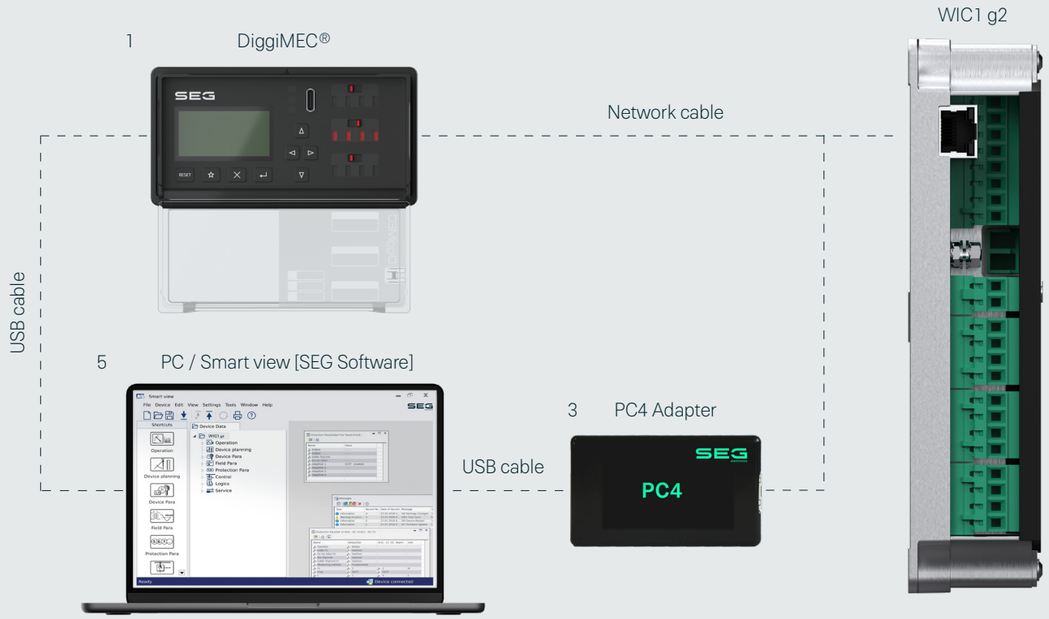
- DiggiMEC® Nano HMI [Image 1]
- With the DiggiMEC®, there are also up to three flag indicators available.
- WIC1 wide range CT [Image 2]
- WIC1 PC4 Adapter [Image 3]
- Flag indicators [Image 4] – SEG offers two mechanical flag indicators – WI1SZ4 and WI1SZ5 – as accessories for the WIC1.
- SEG configuration and analysis software “Smart view” [Image 5]
- Adapter CT (for 3 phases, combined in one housing) [image 6]

If the DiggiMEC user interface is connected to the WIC1, it is also possible to connect a PC to the USB interface of the DiggiMEC. Via PC you can then simply and conveniently execute the parameterizing and analyzing software “Smart view” and enable the user to make all settings via this connection, or to save settings to a file on the PC, or retrieve measured values or fault recorder.

2

4

6



DiggiMEC® - Nano-HMI with up to three integrated mechanical flag indicators

The DiggiMEC® is an upgrade option to the WIC1 family. It fits into a standard door cutout of 92 mm × 45 mm [DIN IEC 61554]. Its display can visualize measuring values on site. Moreover, the DiggiMEC® provides access to the protection parameters that are always exclusively inside the WIC1 relay. The Nano-HMI offers integrated Flag Indicators, binary outputs and configurable LEDs. The DiggiMEC® can be mounted in no time and without any drilling.

Condition Monitoring

- Breaker Wear
- Live Measurement Values Transformer Life Load Monitoring
- Peak Current Pointer

Commissioning Support

- Manually Force Relay Positions
- Trip Indicators (manual reset option)
- Test Trip (powered via USB)

Auto Fault Report

- Fault reports will pop up on the display automatically.
- Mechanical Flag Indicators indicate in a power outage safe manner what has happened.

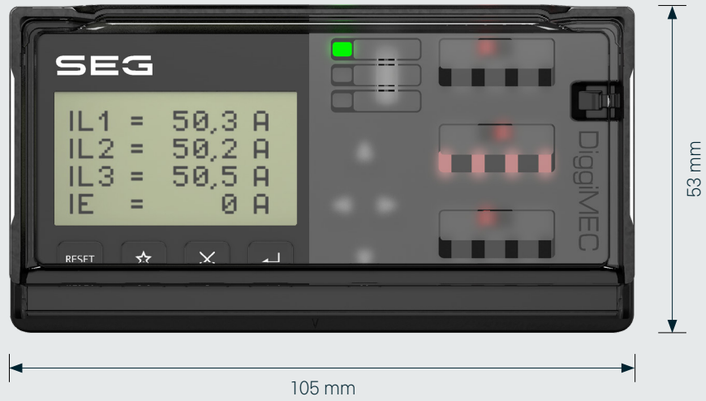
Settings

Software settings (offline created) can be loaded into the WIC1 relays via the USB-C port of the DiggiMEC® or via the PC4 Adapter. Just connect the DiggiMEC® and WIC1 relay via a standard Ethernet cable.

Setting of protective elements beyond DIP/HEX switches:

- Alternative Flag Indicator Assignments
- I>>> / 50 / 51 (Third Overcurrent Element)
- IG>> / 50N/G; 51N/G (Second Ground Current Element)
- ThR / 49 (Thermal Protection)
- Option for flexible use of the FI (flag indicator) output of the WIC1, e. g. for measuring pickup times, or as a self-supervision contact (with external DIN rail output relay)
- I2/I1> / 46 (Unbalanced Load)
- I2> / 51Q (negative Sequence Current Protection)
- TCM / 74TC (Trip-Circuit Monitoring)
- CBF / 50BF, 62BF [only WIC1-4] (Circuit Breaker Failure)
- CLPU (Cold Load Pickup) [only WIC1-4]
- Sgen (Fault Simulator)
- BkrWear (Breaker Wear)
- SBM (Station Battery Monitoring) [only WIC1-4]

DiggiMEC® [Original size]



Order Form – WIC1-1, WIC1-2 & WIC1-3

WIC1 g2 – CT Powered Time Overcurrent and Ground (Earth) Current Relay	-	#	#	#	#	#	#	#	#	#
Relay type		↓								
Parameter setting via Smart view (PC) or DiggiMEC		1								
Parameter setting via DIP switches, Smart view (PC) or DiggiMEC		2								
Parameter setting via HEX switches, Smart view (PC) or DiggiMEC		3								
CT Type, DIP/HEX Range			↓							
Wx CTs or WC1 Converter CTs, DIP/HEX Range 1			S							
WC2 Converter CTs, DIP/HEX Range 2			D							
Ground Current Method				↓						
Configurable (Meas. Ground Current default) [1]				G						
Configurable (Calc. Ground Current default, only WIC1-2, WIC1-3) [1]				B						
Nominal frequency					↓					
50 Hz [2] (only WIC1-2, WIC1-3)					5					
60 Hz [2] (only WIC1-2, WIC1-3)					6					
50 Hz / 60 Hz [2] (WIC1-1 only)					0					
Outputs						↓				
"TC" (Trip Coil pulse) output: Trip Command |										
"FI" (Flag Indicator pulse) output: configurable for Self-Supervision [3]						C				
Inputs							↓			
1 assignable Digital Input (115 Vac or 230 Vac)							C			
Backup Protection / Self-Supervision								↓		
Self-Supervision operates "FI"-Output [3,4]								0		
Self-Supervision operates "TC"-Output [4]								1		
Self-Supervision operates "TC"-Output (if current > 20 * In,max)								2		
Protection Packages									↓	
ANSI 50, 50G/N, 51, 51G/N, Inrush Blocking, 50BF, 74TC									S	
Package "S" + ANSI 46, 49, 51Q, Breaker Wear, Condition Monitoring (= Life Load, Drag Indicator)									A	
Package "A" + SOTF, external protection*DI), ultra-fast overcurrent protection									P	
Communication										↓
Without communication protocol										A

[1] Via Smart view (PC) / DiggiMEC® (but not via DIP/HEX switches), it is possible to configure the device for either calculated or measured ground (earth) current. The input for the measured ground (earth) current has a rated current of 1 A.
[2] Via Smart view (PC) / DiggiMEC® (but not via DIP/HEX switches), it is possible to configure the device for either 50 Hz or 60 Hz nominal frequency.
[3] Self-Supervision via „FI" is only available in the combination: »Backup Protection / Self-Supervision« = „0"
[4] Trip of the backup protection as soon as sufficient electrical energy for a trip impulse of a WIC1).
For WIC1-1, WIC1-2, WIC1-3 *DI) External protection is usable only with a Digital Input.
For WIC1-4 *DI) Several supported input voltages for Digital Inputs. External protection is usable only with at least one Digital Input

Order Form – WIC1-4

WIC1 g2 – Dual-Powered Time Overcurrent and Ground (Earth) Current Relay	-	#	#	#	#	#	#	#	#
Relay type		↓							
Dual-Powered Relay, parameter setting via Smart view (PC) or DiggiMEC		4							
CT Type, DIP/HEX Range			↓						
Wx CTs or WC1 Converter CTs, DIP/HEX Range 1			S						
WC2 Converter CTs, DIP/HEX Range 2			D						
Ground Current Method				↓					
Configurable (Meas. Ground Current default) [1]				G					
Nominal frequency					↓				
50 Hz / 60 Hz [2]					0				
Outputs						↓			
"TC" (Trip Coil pulse) output: Trip Command | "Out" output: configurable						C			
Inputs							↓		
2 assignable Digital Inputs *DI)							D		
Backup Protection / Self-Supervision								↓	
Self-Supervision operates "FI"-Output [3,4]								0	
Self-Supervision operates "TC"-Output [4]								1	
Self-Supervision operates "TC"-Output (if current > 20 * In,max)								2	
Protection Packages									↓
ANSI 50, 50G/N, 51, 51G/N, Inrush Blocking, 50BF, 74TC									S
Package "S" + ANSI 46, 49, 51Q, Breaker Wear, Condition Monitoring (= Life Load, Drag Indicator)									A
Package "A" + SOTF, CLPU, external protection*DI), ultra-fast overcurrent protection									P
Communication									↓
Without communication protocol									A
Modbus RTU | RS485 / terminals									B
Modbus TCP | Ethernet 100 MB / RJ45									C
Modbus TCP | Optical Ethernet 100 MB / LC duplex connector									L

Order Form – DiggiMEC® / PC4-Adapter

DiggiMEC® – Nano-HMI with optional Flag Indicators	-	#
Type		↓
Door mounting, 0 bi-stable relays / flag indicators		0
Door mounting, 1 bi-stable relay / flag indicator		A
Door mounting, 3 bi-stable relays / flag indicators		B

PC4 adapter – USB connection interface for WIC1 and PC	**Art. No.**
USB-C connection interface	WIC1PC4

Approvals

CE certified

certified by EAC
(Eurasian Conformity)

UKCA certified

UL File Nr.: E217753
cULus Certification of WIC1 and DiggiMEC® – UL508, E217753 – NRGU (not valid for an external supply above 24 VDC)

Design Standards

Generic: EN 61000-6-2 [2019]
EN 61000-6-3 [2022]
Product: IEC 60255-1 [2022]
IEC 60255-26 [2023]
IEC 60255-27 [2023]

IEC 60255-149 [2013]
IEC 60255-151 [2009]
IEEE C37.112 [2018]

Protect what you value.

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