

InSwitch®

MODEL YD12K400V

High-reliability, high-efficiency, ultra-compact, low-cost, a.c. electronic device for automatic star-delta connection management in six-terminal, three-phase, squirrel-cage, induction motors. This device performs:

- optimized star-delta starting;
- load-based connection-mode management;
- motor power monitoring;
- motor basic protection and fault diagnosis;
- motor ON/OFF & Star/Delta control;
- wireless and wired communication;
- reactive and active energy savings;
- power factor improvement.

It can replace star-delta starters and electronic soft-starters.

Technical Data for Continuous Duty Type S1 (Preliminary)

Duty Type S1	Rated	Min.	Max.
Voltage, rms, ac	400 V	230 V	500 V
Frequency	50 Hz	50 Hz	60 Hz
Current, rms, ac	30.0 A	--	35.0 A
Apparent power	12 kVA	--	14 kVA
Operating temp.*	50°C	0°C	60°C
Number of phases	3	2	3
TRIAC tripping temp.	100°C	--	--
Supply tripping temp.	80°C	--	--
Efficiency	99.0%	--	99.5%
Internal losses	50 W	0.3 W	60 W
Standby power	< 0.3 W	--	--
In-built communication	RS-485/Modbus and Bluetooth		
External communication	Wi-Fi adaptor, optional		
Operation modes	Manual/Automatic		
Measured motor variables, $f_s = 1 \text{ kHz}$, $T_{\text{integration}} = 100 \text{ ms}$	currents, voltages, active power, reactive power, power factor, electromagnetic torque		
Oversupply protection	By VDR/Varistor		
Internal protection fuse	Fuse Resistor (not replaceable)		
Overvolt. Cat. Poll. Deg.	II - 2 (IEC 664-1)		
Standards & Approvals	EN60950 (reference), CE marking		
EMC Standards	EN61000-6-2, EN61000-6-4		
Protection degree	IP20 acc. to EN60529		
Connection terminals	6 power terminals		
Case material	Aluminum and PA2200		
Approx. weight	370 g		
External Size (W x H x D)	100 x 40 x 58 mm		

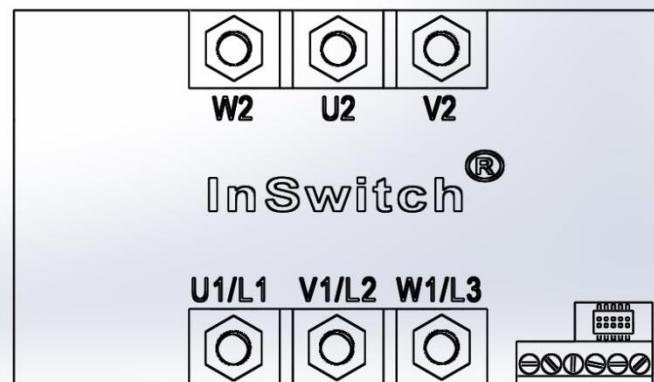
* Assuming a good thermal contact between one of the outer metal surfaces of InSwitch and one of the inner metal surfaces of the motor terminal box.



Protected by:

INPI Patent No. 104070, 2008
INPI Utility Model No. 10828, 2012

TOP VIEW



Pin Assignment

1	W2 (WINDING)	4	U1 (WINDING) & L1
2	U2 (WINDING)	5	V1 (WINDING) & L2
3	V2 (WINDING)	6	W1 (WINDING) & L3

Communication

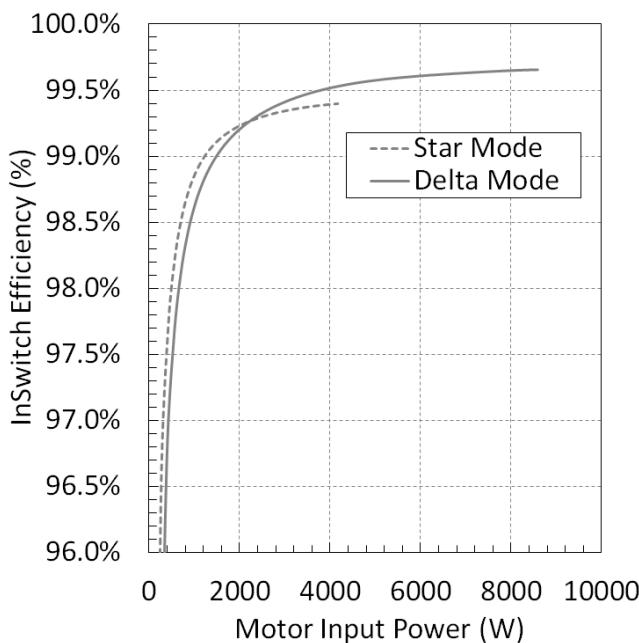
USB (7)	Download/Upload data with local PC/laptop
Bluetooth	Download/Upload data with local PC/laptop, tablet, smartphone, etc., at 1-3 m distance
RS-485	General communication with industrial networks

Software for Commissioning

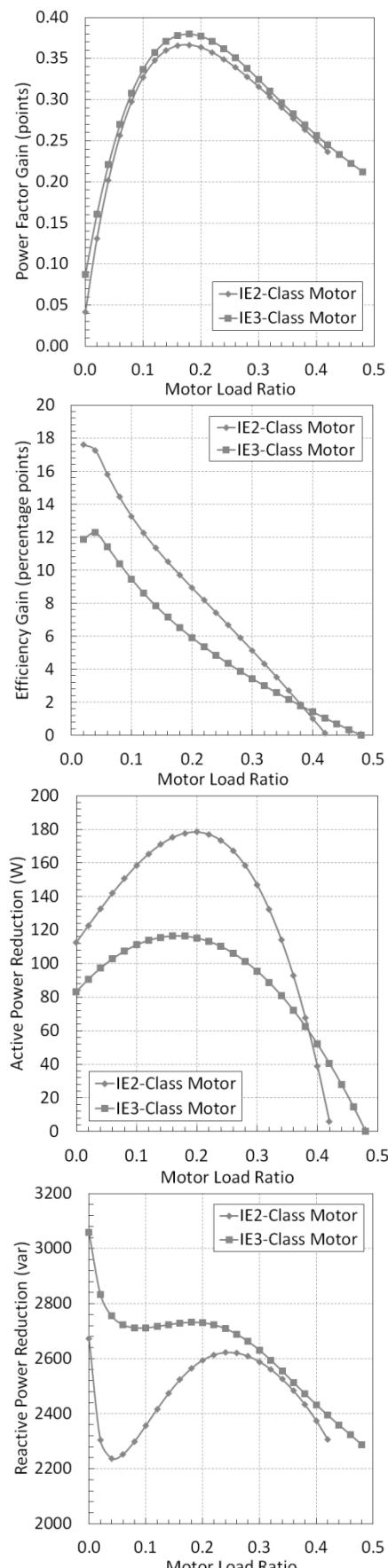
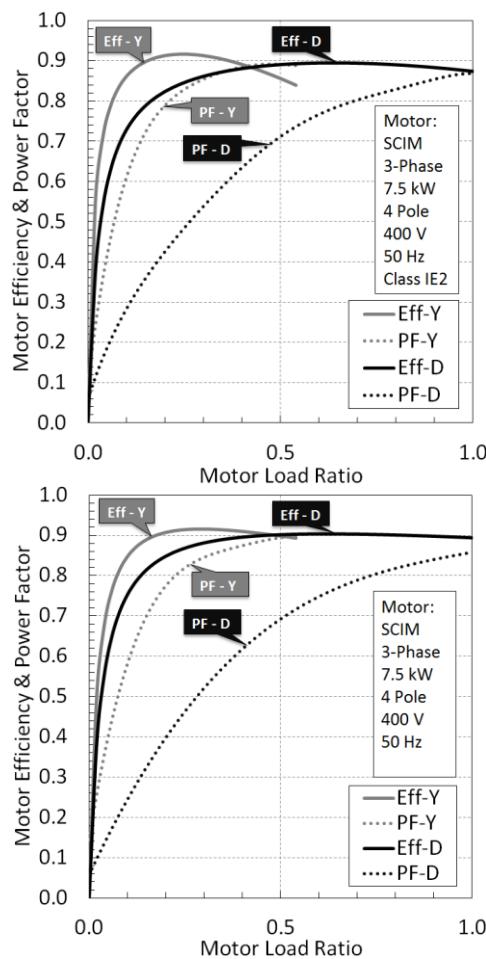
PC/laptop	Windows (32-bit and 64-bit)
Tablet & Smartphone	Android

Note: Technical data are typical and may change without prior notice.

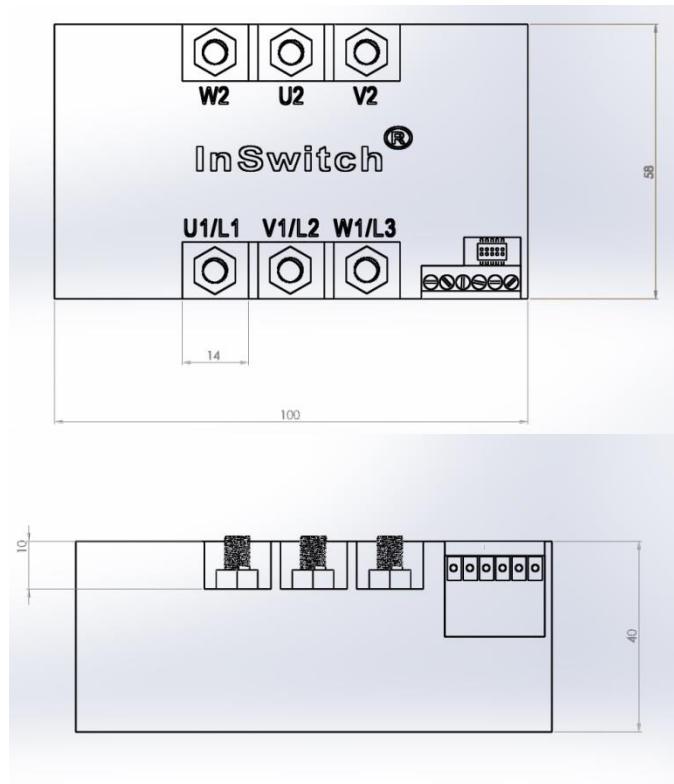
Typical Efficiency Curves



Typical Performance Improvement in IE2- and IE3-Class 7.5-kW, 400-V, Squirrel-Cage Induction Motors



Dimensions

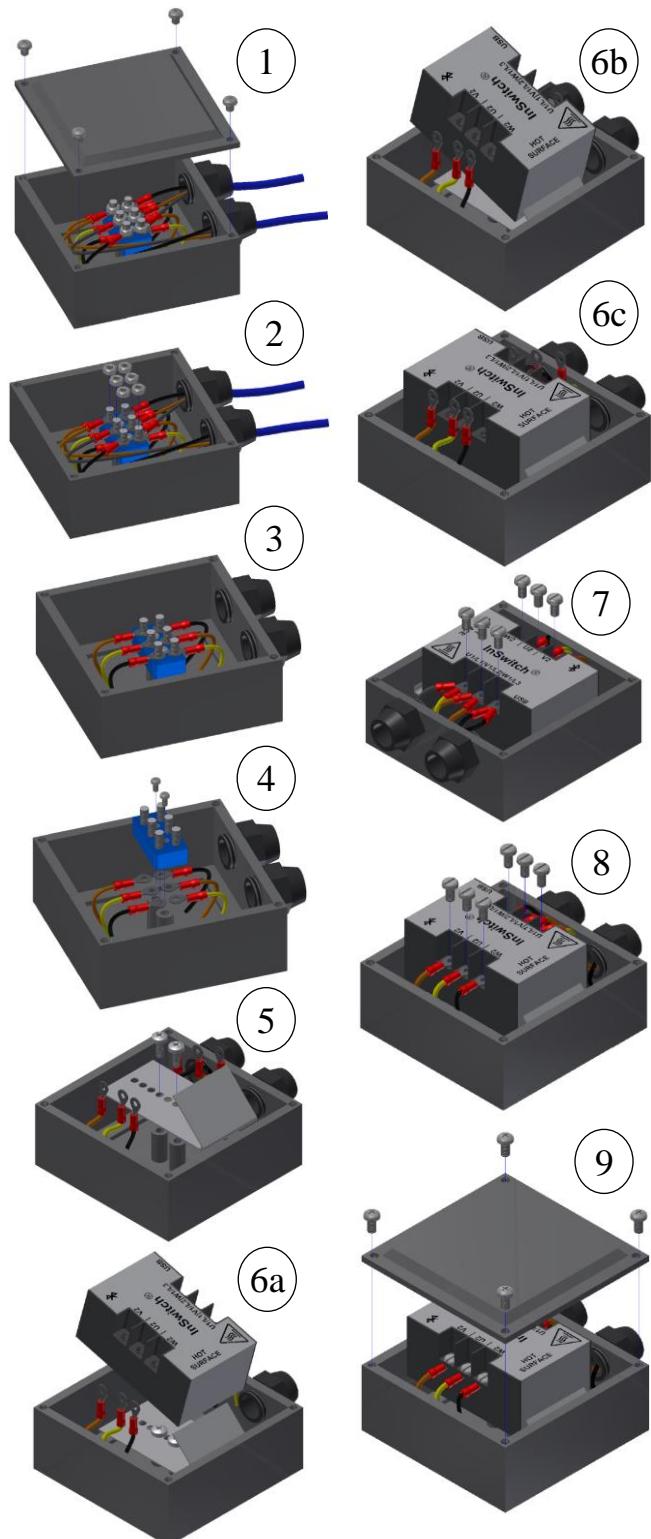


Installation of InSwitch inside the Motor Terminal Box

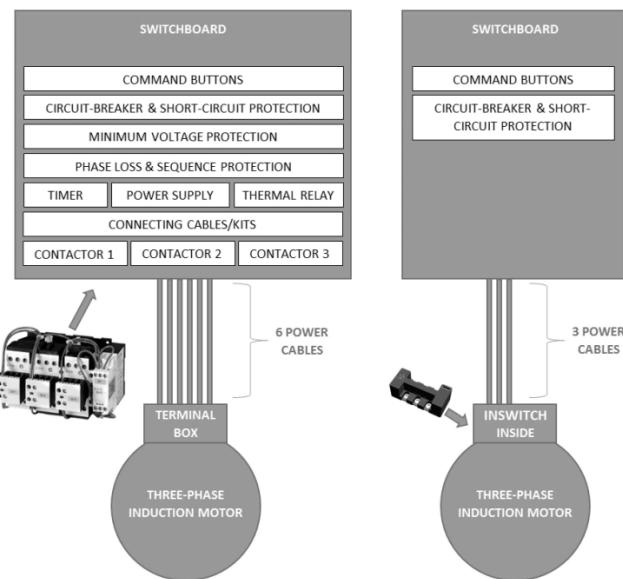
InSwitch is installed inside the motor terminal box. It must have one of the outer metal surfaces with a good thermal contact with one of the inner surfaces of the motor terminal box side walls (preferable the side wall of the non-drive end). A soft material with high thermal conductivity may be provided with InSwitch to be used as interface between InSwitch and the terminal box surfaces.



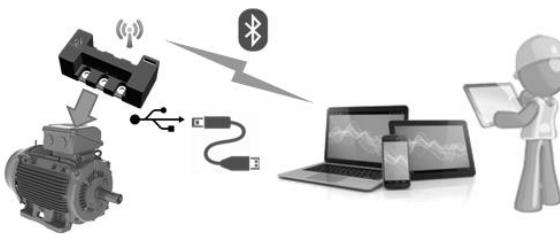
The InSwitch installation can be made in 9 steps.



Electrical Installation – InSwitch vs. Star-Delta Starters



Software for Commissioning InSwitch



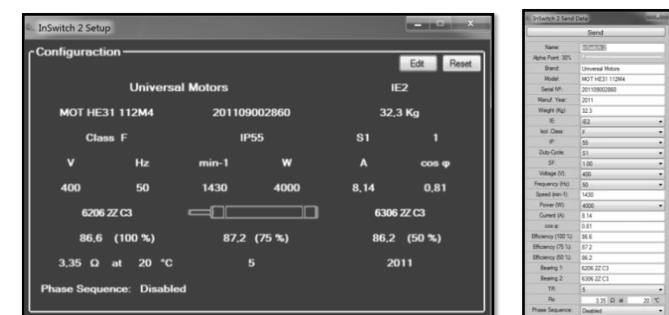
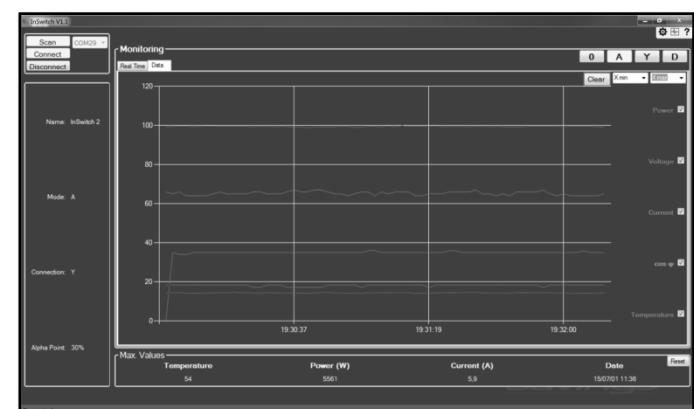
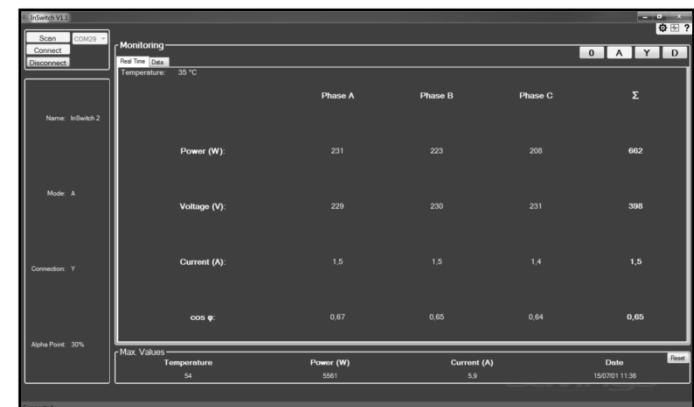
Measured and calculated variables refreshed every second in the software applications.

Android Application



Allows configuring the InSwitch to a particular motor and displays the voltages, currents, active power, reactive power, power factor, electromagnetic torque and Park's Vector.

Windows Application



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OPTISIGMA – ENERGIA & AMBIENTE, LDA.

Edifício INOPOL, Academia de Empreendedorismo, Quinta Agrícola, Bencanta, 3040-316 Coimbra, Portugal
&
EDP Starter, Av. 24 de Julho, Nº 12
Torre Poente – 2º Piso, 1249-300 Lisboa, Portugal