GE
Grid Solutions

iSTAT i400
i4CA, i4VA; i4Dx, i4XS

Mean Sensing (i4CA, i4VA), DC (i4Dx) Transducers and i4XS Communications Interface

The iSTAT i400 range of Mean Sensing AC transducers, DC transducers and communications interface provide easy installation and commissioning as well as simple and economical monitoring and communications.

The iSTAT i400 Mean Sensing and DC transducers are simple and compact offerings available to measure AC or DC circuits respectively for utility and industrial applications. The self-powered, i400 Mean Sensing AC transducers (i4CA, i4VA) are used to measure current or voltage and provide an output analogue signal as an indication.

The iSTAT i400 DC measuring transducers monitor values such as DC Volts (i4DB), DC Current (i4DC), Tap Position (i4DA), Resistance (i4DF) and Temperature (Resistance Temperature Detector (RTD)) (i4DG) and provides an analogue output or communications. The i400 i4Dx DC measuring transducers also provide Modbus serial communications for integration into monitoring systems.

The iSTAT i4XS communications interface provides a Serial to Ethernet interface allowing easy connection and integration of devices to a communications network and monitoring system.

Key Benefits

i4CA, i4VA Mean Sensing Transducers

• Economical monitoring with a self powered transducer that outputs an analogue value proportional to the input signal
• Orderable with preconfigurable current/voltage specification
• Compact size, DIN mountable and self powered for easy installation

i4Dx Digital DC Transducers

• Economical simple monitoring of key values and setting of analog outputs or communications
• Configurable using QDSP software
• Standard Serial (RS232 or RS485) communications
• Easy installation with compact size, DIN mountable with available universal power supply

i4XS Communications Interface

• Serial RS232 or RS485 to Ethernet communications interface
• Serial transmission rates from 1,200 to 115,200 bits per second
• Easy installation with DIN rail mounting
• Universal AC/DC auxiliary power supply

Simple Monitoring

• Economical monitoring of single-phase values and setting of outputs.
• Standard serial communications for integration into monitoring systems (i4Dx)

Easy Installation and Commissioning

• Compact transducer and DIN rail mountable case
• Self-powered (i4CA, i4VA)
• Software based QDSP software setup (i4Dx)
• Support for Modbus communications protocol (i4Dx)
• i4XS provides Serial RS232 or RS485 to Ethernet Communications

iSTAT i4CA, i4VA Mean Sensing Transducers

i4CA Current Transducer

The i4CA measures and monitors single phase current in an electrical power network and provides an analog DC output that can be used for devices such as PLCs, PCs, microprocessor control, indicators, alarms units etc.

Current input can be connected via a corresponding current transformer (with standard 1A or 5A output).

i4CA Current Transducer

i4VA Voltage Transducer

The i4VA measures and monitors single phase voltage in an electrical power network and provides an analog DC output that can be used for devices such as PLCs, PCs, microprocessor control, indicators, alarms units etc.

Voltage input can be connected either directly to low voltage network or shall be connected to network via a corresponding voltage transformer (with standard 100V output).

i4VA Voltage Transducer

iSTAT i4Dx DC Transducers (i4Dx)

The i4Dx DC measurement transducers have a variety of specific monitoring functions and applications for use in industrial or utility applications to convert nonlinear resistance sensors (RTD – sensors) into DC current or DC voltage signal outputs.

iSTAT i4Dx transducers are customer configurable using GE iSTAT QDSP setup software and are supplied with Serial (RS232 or RS485) communications to allow configuration of the transducer and communications of measurement values to a monitoring system. The i4Dx transducers are compact and DIN mountable and are also provided with a standard AC auxiliary power supply with option of a universal power supply for easy installation.

i4DC Current Transducer

i4DA Tap Position Indicator

The i4DA indicates the tap position by measuring the resistance proportional to the actual tap position. It monitors up to 100 steps with a minimum value of 30 Ohms per step, with a total resistance range of 100 to 500 k.

i4DB DC Voltage, i4DC Current

The i4DB voltage and i4DC current transducers measure DC voltage or current values respectively and convert them to proportional DC analogue values.

i4DF Resistance

The i4DF transducer measures resistance values using 2, 3 or 4 wire connections and converts this to a proportional DC analogue value. The measurement range can be 10 to 50 k Ohms or 100 to 500 k Ohms.

i4DG Temperature

The i4DG transducer measures temperature using either Pt100, Pt1000, Ni100 RTD sensors and converts this to a proportional DC analogue value. The externally supplied RTD sensors can be connected as 2, 3 or 4 wire. The measurement range can be -200°C to +850°C (Pt) or -608°C to +250°C (Ni).

iSTAT i4XS Communications Interface

The i4XS connects devices with Serial (RS232 or RS485) ports to an ethernet network enabling communications between devices and a monitoring or HMI system on a workstation.

The i4XS provides an Ethernet RJ45 10/100 BASE-T terminal and depending on the model ordered a Serial RS232 bolted direct connection for a single connection or a Serial RS485 bolted network connection for up to 32 connections. The interfaces are designed for reading data from instruments (by means of corresponding software) with a communication rate of up to 115.2 kbps.   A unique MAC address is provided for each Ethernet connection and an IP address can be set in the i4XS for programming using a standard web browser.

The i4XS is easy to install with the housing designed for a standardized DIN 35x15 mm rail mounting (in compliance with EN 50022) and an auxiliary AC supply that is selected at order is available.

i4XS Front

## Easy Configuration with QDSP Settings Software (i4Dx)

The iSTAT i4Dx DC transducers can be configured using iSTAT QDSP settings software via connection with the Serial (RS232 or RS485) communications port. QDSP settings software is used across the range of GE iSTAT programmable measurement center and transducer products. The software provides functionality for device setup, simulation and visualization.
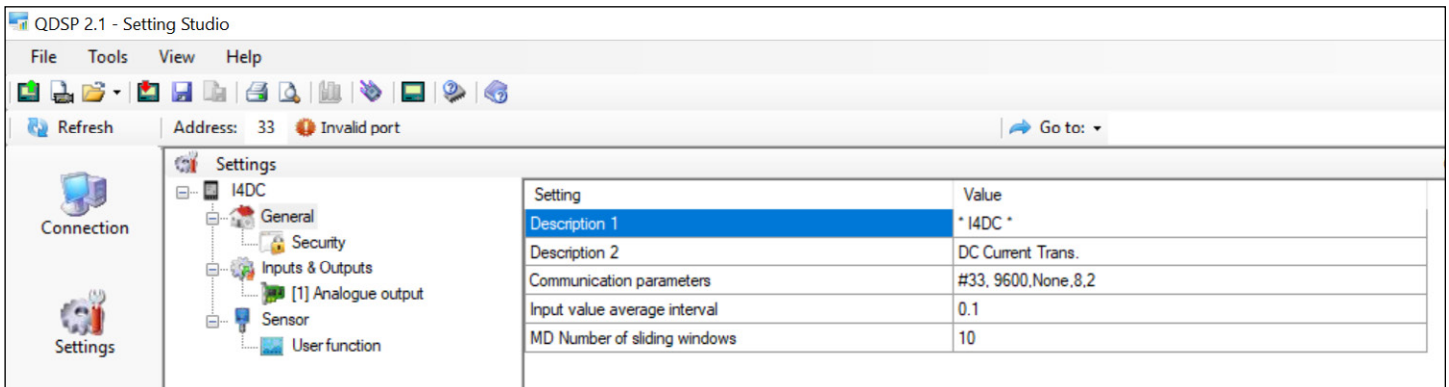
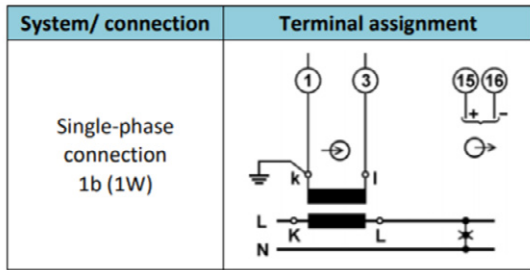*Software based configuration using iSTAT QDSP settings software*

Dimensional Drawings

i4CA, i4VA, i4Dx, i4XS
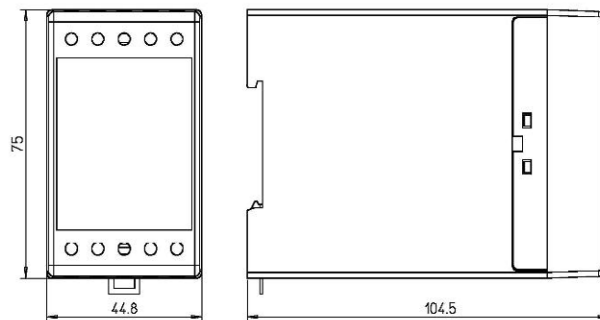
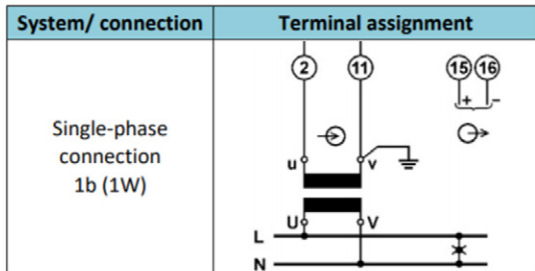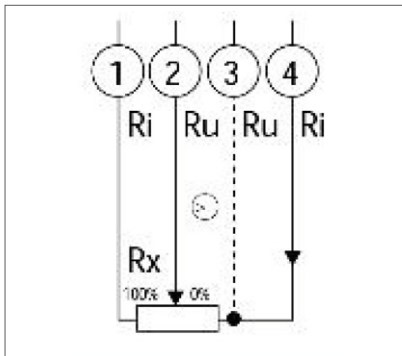*Note: All dimensions are in millimeters*

Wiring Diagrams

i4CA

System/ connection	Terminal assignment
Single-phase connection 1b (1W)	

Function			Connection
Measuring input	AC current	I ⊖	1/3
Analogue output		+ ⊖→	15
		− ⊖→	16

i4VA

System/ connection	Terminal assignment
Single-phase connection 1b (1W)	

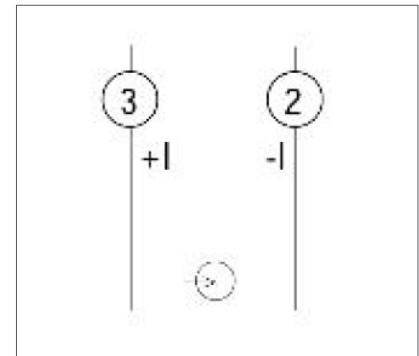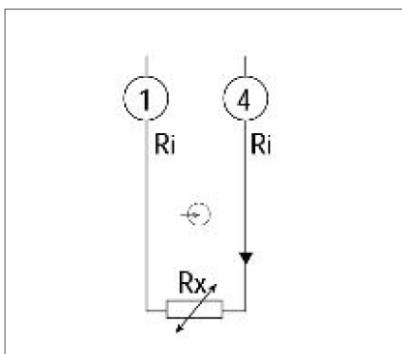| Function			Connection
Measuring input	AC voltage	U ω	2/11
Analogue output		+ ϖ	15
		− ϖ	16

i4Dx

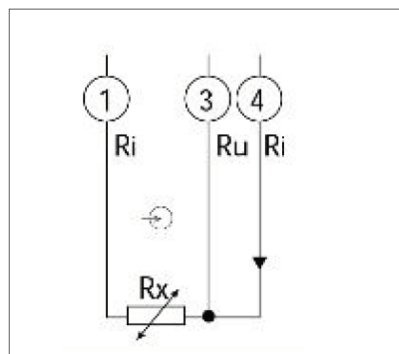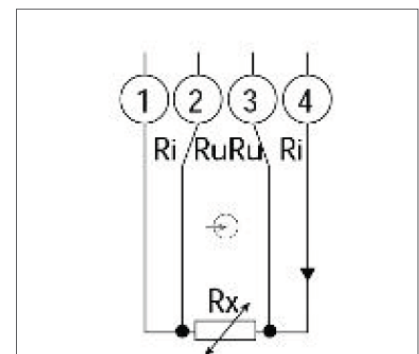i4DA Tap Position Indicator
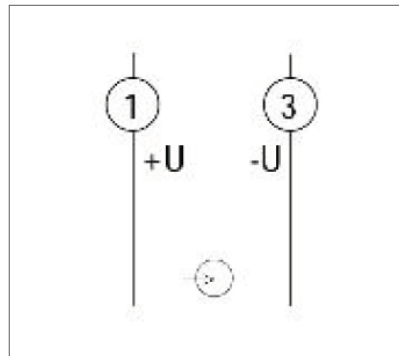
i4DB DC Voltage

i4DC DC Current

i4DF Resistance
i4DG Temperature (RTD) – 2 Wire

i4DF Resistance
i4DG Temperature (RTD) – 3 Wire

i4DF Resistance
i4DG Temperature (RTD) – 4 Wire

Technical Specifications

VOLTAGE MEASUREMENTS (i4VA)

- Standard nominal input voltage (UN) 57.7, 63.5, 69.3, 100, 110, 115, 120, 127, 220, 230, 240, 250, 380, 400, 415, 440, 500 V
- Measuring range limit values 0 ... 50 V to 0 ... 500 V
- Overload capacity: acc. to EN 60688
- Max. measured value (cont.) 1.2 x UN
- Max. allowed value 2 × UN ; 1 s, 10 times, 10 s
- interval
- Consumption < 2 VA

CURRENT MEASUREMENTS (i4CA)

- Standard nominal input current (IN) 1 A, 5 A or 6 A
- Measuring range limit values 0 ... 0.5 A to 0 ... 6 A
- Overload capacity acc. to EN 60688
- Max. measured value (cont.) 1.2 x IN
- Max. allowed value 20 × IN ; 1 s, 10 times, 300s interval
- Consumption < 2 VA

FREQUENCY MEASUREMENTS (i4CA, i4VA)

- Nominal frequency (fN) 50 / 60 Hz
- Measuring frequency range 45 ... 65 Hz

MEASURING OUTPUT (i4CA, i4VA)

- Standard ranges IAN: 0 ... 1 mA, 0 ... 5 mA, 0 ... 10 mA, 0 ... 20 mA
- Burden voltage: 10 V
- External resistance: RB max = 10 V / IAN
- Maximal output voltage (open circuit current output) < 25 V
- Maximal output current 3 × IAN
- Residual ripple < 1 % p.p.
- Response time < 300 ms

ENVIRONMENTAL (i4CA, i4VA)

- Nominal temperature range - 10 ... 15 ... 30 ... 55 °C
- Operating temp. range - 20 to + 70 °C
- Storage temperature range - 40 to + 70 °C
- Average annual humidity ≤ 93 % r.h.
- Altitude ≤ 2000 m
- Indoor use only

COMMUNICATION (i4DX)

SERIAL COMMUNICATION RS232

- Connection type: Point to point
- Signal levels: RS232
- Maximum cable length: 15 m
- Connector: Screw terminals
- Isolation: 3.7 kV rms for 1 minute between all terminals and all other circuits, except between communication terminals and output terminals, 2 kV rms for 1 minute
- Transmission mode: Asynchronous
- Message format: MODBUS RTU
- Data rate : 1.200 to 115.200 bits/s

SERIAL COMMUNICATION RS485

- Connection type: Multi-drop (32 connections per link)
- Signal levels: RS485
- Cable type: Screened twisted pair
- Maximum cable length: 1000 m
- Connector: Screw terminals
- Isolation: 3.7 kV rms for 1 minute between all
- terminals and all other circuits, except between communication terminals and output terminals, 2 kV rms for 1 minute
- Transmission mode: Asynchronous
- Message format: MODBUS RTU
- Data rate (very high speed): 1,200 to 115,200 bits/s

POWER SUPPLY (i4DX)

UNIVERSAL

- Auxiliary AC/DC voltage (universal):
- Rated voltage (Ur): 24...300 V DC 40...276 V AC
- Frequency range: 40...70 Hz
- Power consumption: < 3 VA

AUX AC VOLTAGE

Rated Voltage Ur 57.74V, 100V, 230V, 400V, 500V

- Rated operating range 80...120 % Ur
- Frequency range: 45...65 Hz
- Power consumption: < 3 VA

ENVIRONMENTAL (i4DX)

- Climatic rating: Climate class 2 acc. To EN 60688: 1992
- Operating temperature -10 to +55 °C
- Storage temperature -40 to +70 °C
- Annual mean relative humidity: ≤ 75% r.h.

MECHANICAL (i4CA, i4VA, i4DX)

- Dimensions W45 × H75 × D105 mm
- Mounting Rail mounting 35 × 15 mm (acc. to EN 50022)
- Enclosure material PC / ABS
- Flammability Acc. to UL 94 V|0
- Connection terminals ≤ 4.0 mm2 solid wire ≤2.5 mm2 stranded wire
- Weight approx. 300g

COMPLIANCE (i4CA, i4VA)

- IEC 61010-1 Safety requirements for electrical equipment for measurement, control and laboratory use
- IEC 60688 Electrical measuring transducers for converting AC electrical variables into analogue and digital signals
- IEC 61326 EMC requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements
- IEC 60529 Degrees of protection provided by enclosures (IP code)
- IEC 60068-2-1/ -2/ -6/ -27/-30 Environmental testing (-1 Cold, -2 Dry heat, -30 Damp heat, -6 Vibration, -27 Shock)
- UL 94 Tests for flammability of plastic materials for parts in devices and appliances

COMPLIANCE (i4DX)

- Low voltage directive 73/23/EEC: EN 61010-1: 1993 and EN 61010-A3: 1995
- Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1: General requirements
- EMC directive 89/336/EEC: EN 61326-1: 1997
- Electrical equipment for measurement, control, and laboratory use EMC requirements, Part 1: General requirements.

Note: Additional Technical Specifications can be found in the Instruction Manual

Technical Specifications – i4XS Communications Interface

COMMUNICATION (i4XS)

ETHERNET
- Type of connection: Direct
- Signal levels: 10 / 100 BASE–T
- Max. cable length: 100 m
- Terminals: RJ–45
- Mode of transmission: asynchronous
- Protocol: IEEE 802.3
- Transmission rate: 10M / 100M bit/s

SERIAL COMMUNICATION RS232
- Type of connection: Direct
- Signal levels: RS232
- Max. cable length: 3 m
- Connection terminals: bolted connection
- Isolation: 3.7 kV eff., 1 minute between terminals and other circuits
- Transmission mode: asynchronous
- Transmission rate: 1.200 to 115.200 bit/s

SERIAL COMMUNICATION RS485
- Type of connection: Network (up to 32 connections per conductor)
- Signal levels: RS485
- Connection: twisted pair
- Max. cable length: 1000 m
- Connection terminals: bolted connection
- Isolation: 3.7 kV eff., 1 minute between terminals and other circuits
- Transmission mode: asynchronous
- Transmission rate: 1.200 to 115.200 bits/s

POWER SUPPLY (i4XS)

UNIVERSAL
- Auxiliary AC/DC voltage (universal):
- Rated voltage (Ur): 24...300 V DC 40...276 V AC
- Frequency range: 40...70 Hz
- Power consumption: < 3 VA

ENVIRONMENTAL (i4XS)
- Climatic class: 3 in compliance with EN 61268: 1995
- Operating temperature -10 to +65 °C
- Storage temperature -40 to +70 °C
- Annual mean relative humidity: ≤ 75% r.h.

MECHANICAL (i4XS)
- Housing material: PC/ABS characteristics comply with UL 94 V-0
- Protection: IP 50 (IP 20 for connection terminals) in compliance with EN 60529, 1989
- Protection protection class II
- 300 V eff., installation category III pollution degree 2
- Test voltage: 3.7 kV eff. in compliance with SIST EN 61010-1: 2002
- Converter mass: < 300 g

COMPLIANCE (i4XS)
- Decree on electrical equipment designed for use within certain voltage limits URLRS 53/00
- (Low Voltage Directive 73/23/EEC):
- SIST EN 61010-1: 1999 and EN 61010-A3: 1995
- Electrical safety testing for measurement and laboratory devices, part 1: General requirements
- Electromagnetic Compatibility Regulation (EMC) URLRS 61/00
- (Electromagnetic Compatibility Directive 89/336/EEC): SIST EN 55024: 2000

Note: Additional Technical Specifications can be found in the Instruction Manual

Ordering Codes

i4CA, i4VA Mean Sensing Transducers	*	*	*	*	*	Description
Function	i4CA					i4CA Mean Sensing Current
	i4VA					i4VA Mean Sensing Voltage
Output		B				0...5 mA
		D				0...10 mA
		E				0...25 mA
Auxiliary supply			A			Self Powered
Communications				0		None
Voltage					57.7	57.7 Vac
					63.5	63.5 Vac
					69.3	69.3 Vac
					100	100 Vac
					110	110 Vac
					115	115 Vac
					120	120 Vac
					127	127 Vac
					220	220 Vac
					230	230 Vac
					240	240 Vac
					250	250 Vac
					380	380 Vac
					400	400 Vac
					415	415 Vac
					440	440 Vac
					500	500 Vac

Ordering Codes (Continued)

i400 i4DA Tap Position

i400 i4DA Tap Position	*	*	*	*	*	*	Description
Function	i4DA						i4DA Tap Position
Output		P					Full scale from 1mA to 5mA
		Q					Full scale from 6mA to 20mA
		R					Full scale from 1V to 10V
Auxiliary supply			U				Universal AC/DC supply (40-276 Vac, 24-300 Vdc)
			2				57 Vac
			D				100 Vac
			V				230 Vac
			4				400 Vac
			5				500 Vac
Communications				2			RS232
				4			RS485
Wires					3		
Resistance Range						050	0 ... 100 Ohm to 0 ... 50 kOhm
						500	0 ... 1k Ohm to 0 ... 500 kOhm

i400 i4DB DC Voltage

i400 i4DB DC Voltage	*	*	*	*	*	Description
Function	i4DB					i4DB DC Voltage
Output		P				Full scale from 1mA to 5mA
		Q				Full scale from 6mA to 20mA
		R				Full scale from 1V to 10V
Auxiliary supply			U			Universal AC/DC supply (40-276 Vac, 24-300 Vdc)
			2			57 Vac
			D			100 Vac
			V			230 Vac
			4			400 Vac
			5			500 Vac
Communications				2		RS232
				4		RS485
DC Voltage Range					300	0±50 mV to 0±1 V
					050	0±1 V to 0±50 V
					001	0±50 mV to 0±1 V

i400 i4DC Current

i400 i4DC Current	*	*	*	*	*	Description
Function	i4DC					i4DC DC Current
Output		P				Full scale from 1mA to 5mA
		Q				Full scale from 6mA to 20mA
		R				Full scale from 1V to 10V
Auxiliary supply			U			Universal AC/DC supply (40-276 Vac, 24-300 Vdc)
			2			57 Vac
			D			100 Vac
			V			230 Vac
			4			400 Vac
			5			500 Vac
Communications				2		RS232
				4		RS485
DC Current Range					100	0±10 mA to 0±100 mA
					010	0±1 mA to 0±10 mA

Ordering Codes (Continued)

i400 i4DF Resistance

i400 i4DF Resistance	*	*	*	*	*	*	Description
Function	i4DF						i4DF Resistance
Output		P					Full scale from 1mA to 5mA
		Q					Full scale from 6mA to 20mAw
		R					Full scale from 1V to 10V
Auxiliary supply			U				Universal AC/DC supply (40-276 Vac, 24-300 Vdc)
			2				57 Vac
			D				100 Vac
			V				230 Vac
			4				400 Vac
			5				500 Vac
Communications				2			RS232
				4			RS485
Wires					4		
Resistance Range						050	10 Ohm to 50 kOhm
						500	100 Ohm to 500 kOhm

i400 i4DG Temperature (RTD)

i400 i4DG Temperature (RTD)	*	*	*	*	*	*	Description
Function	i4DG						i4DG Temperature (RTD)
Output		P					Full scale from 1mA to 5mA
		Q					Full scale from 6mA to 20mA
		R					Full scale from 1V to 10V
Auxiliary supply			U				Universal AC/DC supply (40-276 Vac, 24-300 Vdc)
			2				57 Vac
			D				100 Vac
			V				230 Vac
			4				400 Vac
			5				500 Vac
Communications				2			RS232
				4			RS485
Wires					4		
RTD						PT	Pt 100 - From -200° C to 850° C

i400 i4XS Communication Interface

i400 i4XS Communication Interface	*	*	Description
	I4X	S2UE	RS232 to Ethernet RJ45 Converter
		S4UE	RS485 to Ethernet RJ45 Converter
Data Rate			1,200 to 115,200 bits/s
Auxiliary supply			Universal AC/DC supply (40-276 Vac, 24-300 Vdc)

GEGridSolutions.com