iGW

For flexible and powerful protocol conversion.

UCA International Users Group IEC 61850 compliant

Highlights

- From meter data concentration to protocol conversion – full range of protocols (DNP3.0, IEC 61850 (MMS & GOOSE), DLMS, Modbus, IEC 60870-5-101/102/103/104 etc.) to communicate with all devices and control centers involved in any kind of substation or generation plant
- Adaptable and modular communication units suitable for all energy environments
- Internal switch with RSTP/ PRP/ HSR redundancy
- Up to 4 Ethernet ports, 4 serial ports, and optional, internal 4G, 3G and GPRS modems

Overview

This gateway was designed to provide particularly strong protocol conversion, network redundancy and SCADA automation (incl. IEC 61850) functionalities. It is thus the perfect choice to set up, automize or retrofit generation plants, substations and other control networks requiring data conversion between several protocols, as for instance Modbus to Ethernet or IEC 61850 to DNP3.

The data collection from meters, protection relays, and other IEDs can be performed using any protocol, inlcuding IEC 60870-5, IEC 61850 (MMS/GOOSE), DNP3, DLMS, Modbus or Procome, whilst managing a microseconds timestamp resolution via NTP or PTP. Further, the iGW can also process and transfer the data to one or multiple control centers or SCADA master stations using upstream protocols such as IEC 104, IEC 101, TASE2.0/ ICCP (IEC 60870-6), IEC 61850-90-2, DNP3, and Modbus RTU/TCP.

An architecture based on iGWs is open, efficient and scalable, as it allows to integrate coming generations of devices (IEDs, sensors, routers etc.) and adapt to any kind of network changes, saving you lots of time and money.

Communication Ports

The iGW comes with 2 independent 10/100 BaseTX Ethernet ports (two different MAC addresses, RJ45 connector) and an internal Ethernet switch with (2) 10/100BaseTX, (2) fiber optic FX100 sensors with ST, SC o SFP connectors, and RSTP/PRP/HSR redundancy.

Additionally, the iGW carries 4 software configurable serial ports: 1 full RS-232/RS-485/RS-422 + 2 basic RS-232/RS-485/RS-422 and 1 RS-422/RS-485 port (EXP422) to connect iRTUe models. Optionally, one of the serial ports can be replaced with an internal 4G(LTE), 3G and GPRS modem.

Communication Protocols

The iGW was designed to use a high number of protocols and communicate with several control centers at once.

The stack includes newer protocols such as **IEC 61850 MMS or GOOSE** (A level certified by DNV-KEMA), but also older standard and proprietary protocols such as ModbusRTU/TCP, Profibus, SpaBus, Mlink or Procome. Other supported downstream protocols for meters and protection relays are IEC 60870-5-102/-103, IEC 62056-21 and DLMS, whereas upstream protocols for control centers also include IEC 60870-5-101/-104 or DNP3.0 serial/TCP.

Hot-Standby Redundancy

In a hot-standby architecture, the active iGW continuously feeds the recorded data to the redundant standby iGW to ensure that the newly active iGW has all the historical information (no data loss) when the switchover occurs.

If the active RTU detects that any IED is not able to communicate, it tries to access the IED via the hot-standby RTU, which (in the case there was a connection problem) can pass the data to the active RTU, acting as a serial server.

IP Networking

The iGW is equipped with transparent TCP bridging and configurable IP routing to tunnel any serial protocol (such as *Modbus*) over a TCP/IP connection and facilitate the data transfer through complex IP networks.

Its VLAN and VPN support allow to improve the network's performance, simplifying its traffic management, design and deployment and also helping to secure communications through particularly hazardous networks.

IEC61131-3 PLC Automation

Thanks to its internal PLC based on *IEC 61131-3*, the iRTU can provide powerful automation and control functionalities. For example, you can easily reuse programs on different projects, run multiple PLC instances simultaneously or use triggered variables for control commands and set points. It also allows to run hot program updates, stop PLC executions depending on the quality of selected PLC inputs and debug PLCs online, either cycle-by-cycle or step-by-step.

The iRTU has a high execution speed – a 2000 ST line program takes less than 3ms.

Cyber Security – IEC 62351

iGrid enforces several layers of security measures guided by the propositions of the IEC 62531 standard to protect its devices from all kinds of threats.

The iGW is a hardened device featuring Role Based Access Control (RBAC) to avoid intrinsic risks such as security holes and unauthorized actions by authenticated users. In addition to encryptions via TSL/SSL, HTTPS, SSH and standard procedures for VPNs (e.g. OpenVPN), its communication can also be secured with network control methods such as firewalls, IP filters, ACL or TCP port blocks.

Even smaller, but just as smart.

The iGWlite is a special device for protocol conversion and other gateway functionalities. It almost takes no space on a DIN-Rail, but still employs the full iGrid protocol stack. It carries 1 Ethernet & 1 RS485/RS422 port and can be equipped with an optional RS-232 port (copper or fiber) or a 2G/3G/4G modem.

It is the first gateway worldwide to handle TASE 2.0 to directly connect smaller generation plants with transmission control centers.

More specifications on the back

iGW B0 Series

(4) Software configurable serial ports with LEDs:
- (1) Full RS-232/ RS-422/ RS-485 serial port
- (2) Basic RS-232/ RS-422/ RS-485 serial ports
- (1) RS-422/ RS-485 serial port (EXP-422 port)

(2) 10/100BaseTX Ethernet ports (RJ45 connector)
(1) USB port to connect peripheral devices
(1) MGMT port (MiniUSB connector) for local maintenance

iGW S Series

The S Series carries the B0 ports and an embedded Ethernet switch (connected to one of the two independent Ethernet ports), which provides:

S0 – (3) 10/100BaseTX RJ connectors
(2) FX100 ports with HSR/PRP redundancy and SC, ST or SFP connectors

S3 – (2) 10/100BaseTX RJ connectors and (2) FX100 ports with RSTP redundancy and SC, ST or SFP connectors

M Series

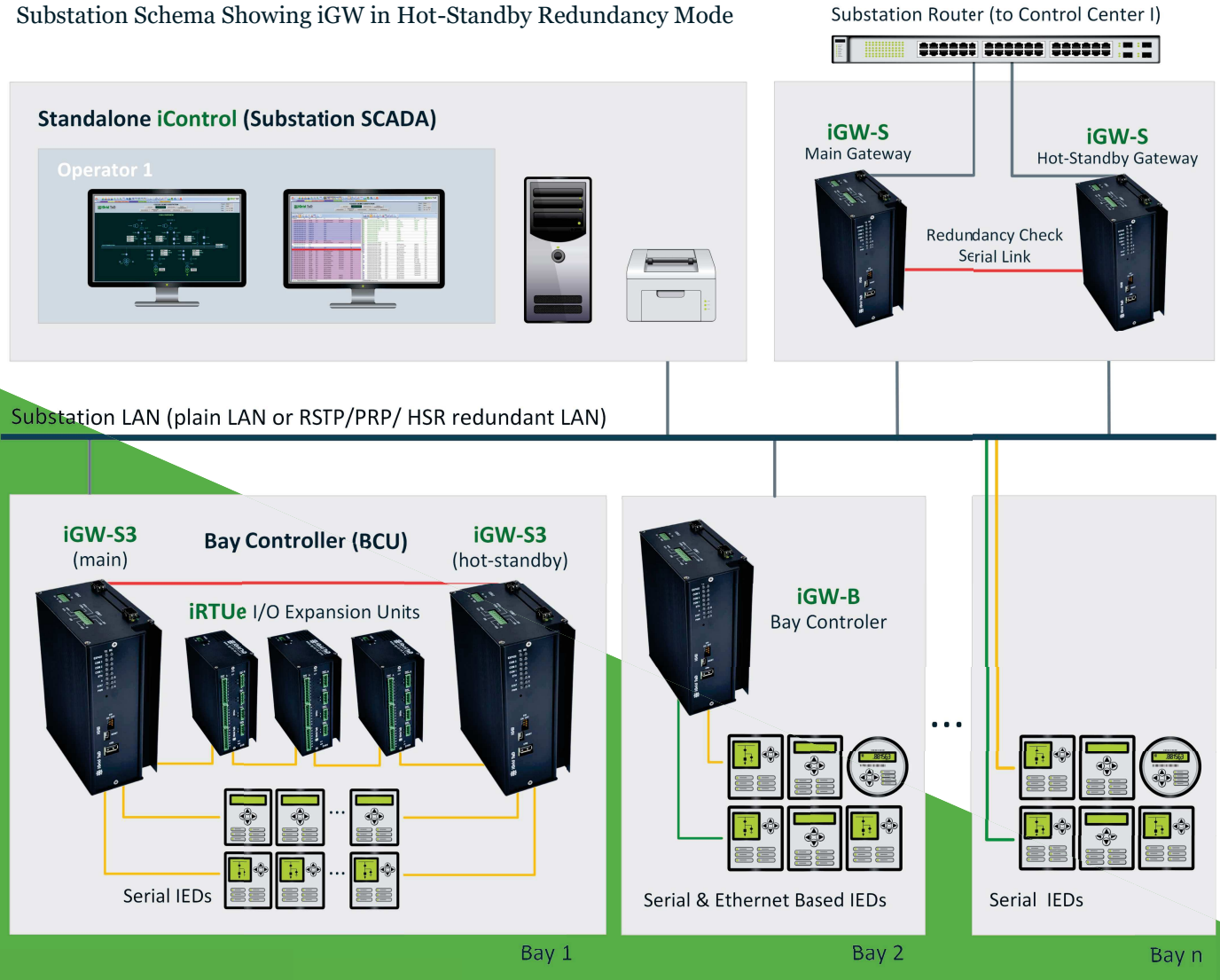
The M series replaces one of the serial ports with an internal modem: **M0** (GPRS), **M1** (3G + GPRS) and **M2** (4G (LTE) + GPRS)

iRTUe – Remote I/O Expansions

The iGWlite can be freely extended with I/Os by connecting several iRTUe.

They are IEC **61850 (GOOSE)** compliant and come in many configurations such as 48 DI, 16 relays, 16 AI, 24 DI + 8 relays, 24 DI + 8 AI or 8 relays + 8 AI.

Substation Schema Showing iGW in Hot-Standby Redundancy Mode



Protocol Stack

Master/Slave IEC 60870-5-101	Master/Slave IEC 60870-5-104
Master/Slave Modbus TCP/UDP and JBUS (master)	Master/Slave ModbusRTU
Master/Slave DNP3.0 (serial, UDP, TCP)	Master IEC 60870-5-103
Master IEC 60870-5-102	Master DLMS
Master Profibus DP	Master Spabus, Mlink, Procome
Master IEC 62056-21	SNMP Agent/Manager
IEC 61850 MMS Client/Server	**IEC 61850 GOOSE Publisher/Subscriber**

iGComms Software Application

Redundancy deployable on a hot-standby configuration, optional redundant power supply

Security IEC 62351-3 and IEC 62351-5 support, including TLS/SSL, SSH and VPN connections

IEC61131-3 automation logic and PLC programming, with LD, FBD, ST and SFC editor

LUA language can be used to create simple and complex logic and mathematical expressions

Communication Ports & CPU

Serial up to 4 software configurable ports with RS232/RS485/RS422

Ethernet (2) 10/100BaseTX ports with independent MAC addresses

Wireless full internal 4G(LTE), 3G and GPRS modem (optional)

Ethernet switch (S series) up to (4) 10/100BaseTX ports with RJ45 connection and (2) FX100

CPU ARM Cortex-A7 @ 528MHz, with 4GBytes Flash and 256MBytes RAM.

EMC Standards

IEC 60950-1, IEC 60255-5:2000, IEC 60255-22:2000, EN 55022, IEC 61000-6-4, IEC 61000-6-5, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-9, IEC 61000-4-10, IEC 61000-4-12, IEC 61000-4-16, IEC 61000-4-17, IEC 61000-4-18, IEC 61000-4-29

General Characteristics

Power supply ***W*** : wide range, 32 - 250Vdc / 80 - 250Vac (2.5kVrms isolation) ***24*** : 19.5-60Vdc (2.5kVrms isolation)

MTBF 177,000h (one hundred seventy seven thousand hours)

Environmental Operating temperature: -25ºC to +70ºC
IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-3, IEC 60068-2-14, IEC 60068-2-30, IEC 60068-2-38

Vibration & shock test IEC 60068-2-6, IEC 60068-2-7

Physical External dimensions: 173 x 78.4 x 137 mm (HxWxD)
IP30 enclosure with DIN Rail mounting

RTC & Time Synchronization

Real-time Clock (RTC) with 1.5 ppm drift and microsecond resolution timestamp

Server NTP, IEC 60870-5-101, IEC 60870-5-104, DNP3.0, PTP

Client IEEE1588(PTP), SNTP, IEC 60870-5-101, IEC 60870-5-102, IEC 60870-5-103, IEC 60870-5-104 DNP3.0, DLMS, Spabus, Mlink, Procome and Profibus DP

Configuration & Maintenance

Easy configuration with iConf tool

Internal web server, allowing real time monitoring of the system and all its internal parameters

Command console with full information on packet exchanges, with all available protocols

Local or remote maintenance via USB or Ethernet port

Simple Configuration with iConf

iConf has been specifically developed for electrical applications, saving you lots of time and money throughout the control system set-up and maintenance tasks, whilst also minimizing your project risks. **Upload** and **download** your configurations, import or scan **SCL files** (**IEC 61850**) and create your own **templates.**

Ordering Information

`iGW-b#bbvvfs`

Main board & communications

B#01	(2) 10/100BaseTX RJ45 Ethernet + (4) serial RS232/RS485/RS422 ports
S#01	PRP/HSR switch with (4) 10/100BaseTX and (2) FX100 Ethernet + (4) serial RS232/RS485/RS422 ports
S#31	RSTP switch with (3) 10/100BaseTX and (2) FX100 Ethernet + (4) serial RS232/RS485/RS422 ports
M#01	2G modem + (2) 10/100BaseTX Ethernet + (3) serial RS232/RS485/RS422 ports
M#11	3G modem + (2) 10/100BaseTX Ethernet + (3) serial RS232/RS485/RS422 ports
M#21	4G modem + (2) 10/100BaseTX Ethernet + (3) serial RS232/RS485/RS422 ports

SD card

S	Internal 8 GB microSD card

Fiber optic interfaces (S models)

T	ST connectors
C	SC connectors
F	SFP interface

Power supply

24	19.2-60 Vdcigital inputs
WV	32-250Vdc // 80-250Vac

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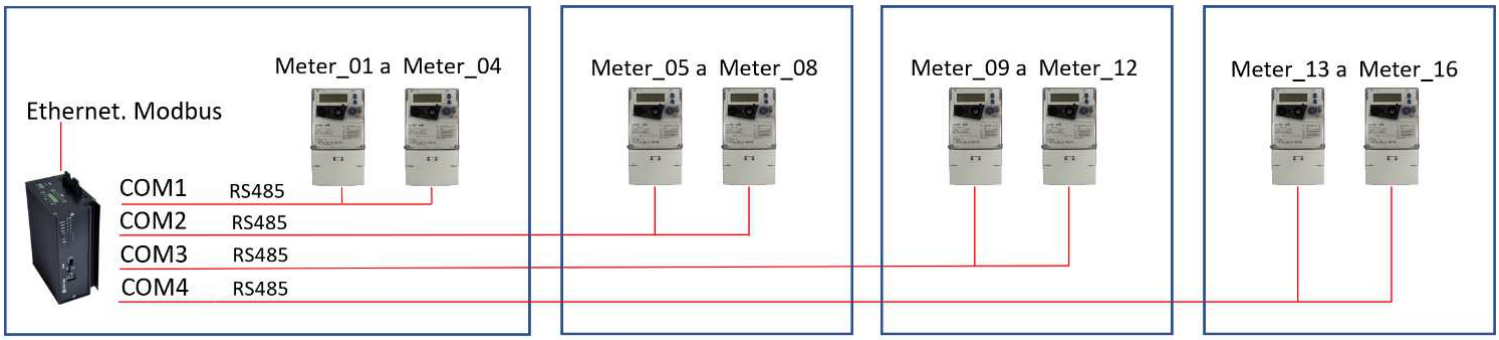
Tabla registros Modbus, remota iGW-B#01WV00



General Information
IP RTU: xxx.xxx.xxx.xxx Port: 502 (Modbus TCP)
Slave ID: 1
Exception codes: True
Mask: 255.255.255.0
GW: xxx.xxx.xxx.xxx
RTU SN: xx.xxx.xxx
Register 32 Format: 0xdcba - Endianness send: [d c b a]
Register 64 Format: 0xhgfedcba - Endianness send: [h g f e d c b a]

METER DATA BASE							
Meter	**COM Port**	**Modbus Register**	**Function Code**	**Description (EN)**	**Format**	**Scale**	**Unit**
METER 01	COM 1 METER XX.XXX.XXX	0	3 or 4	Power_Factor	UINT32	0,001	
		2	3 or 4	Power_Factor L1	UINT32	0,001	
		4	3 or 4	Power_Factor L2	UINT32	0,001	
		6	3 or 4	Power_Factor L3	UINT32	0,001	
		8	3 or 4	L1 Current Inst value	UINT32	0,1	A
		10	3 or 4	L2 Current Inst value	UINT32	0,1	A
		12	3 or 4	L3 Current Inst value	UINT32	0,1	A
		14	3 or 4	Active Power	INT32	0,1	kW
		16	3 or 4	Active Power L1	INT32	0,1	kW
		18	3 or 4	Active Power L2	INT32	0,1	kW
		20	3 or 4	Active Power L3	INT32	0,1	kW
		22	3 or 4	Reactive Power	INT32	0,1	kvar
		24	3 or 4	L1 Voltage Inst value	UINT32	1	V
		26	3 or 4	L2 Voltage Inst value	UINT32	1	V
		28	3 or 4	L3 Voltage Inst value	UINT32	1	V
		30	3 or 4	Active energy consumed	UINT64	1	KWh
		34	3 or 4	Active energy generated	UINT64	1	KWh
		38	3 or 4	Reactive energy 1 quadrant	UINT64	1	Kvarh
		42	3 or 4	Reactive energy 2 quadrant	UINT64	1	Kvarh
		46	3 or 4	Reactive energy 3 quadrant	UINT64	1	Kvarh
		50	3 or 4	Reactive energy 4 quadrant	UINT64	1	Kvarh
METER 02	COM1 METER XX.XXX.XXX	54	3 or 4	Power_Factor	UINT32	0,001	
		56	3 or 4	Power_Factor L1	UINT32	0,001	
		58	3 or 4	Power_Factor L2	UINT32	0,001	
		60	3 or 4	Power_Factor L3	UINT32	0,001	
		62	3 or 4	L1 Current Inst value	UINT32	0,1	A
		64	3 or 4	L2 Current Inst value	UINT32	0,1	A

		66	3 or 4	L3 Current Inst value	UINT32	0,1	A
		68	3 or 4	Active Power	INT32	0,1	kW
		70	3 or 4	Active Power L1	INT32	0,1	kW
		72	3 or 4	Active Power L2	INT32	0,1	kW
		74	3 or 4	Active Power L3	INT32	0,1	kW
		76	3 or 4	Reactive Power	INT32	0,1	kvar
		78	3 or 4	L1 Voltage Inst value	UINT32	1	V
		80	3 or 4	L2 Voltage Inst value	UINT32	1	V
		82	3 or 4	L3 Voltage Inst value	UINT32	1	V
		84	3 or 4	Active energy consumed	UINT64	1	KWh
		88	3 or 4	Active energy generated	UINT64	1	KWh
		92	3 or 4	Reactive energy 1 quadrant	UINT64	1	Kvarh
		96	3 or 4	Reactive energy 2 quadrant	UINT64	1	Kvarh
		100	3 or 4	Reactive energy 3 quadrant	UINT64	1	Kvarh
		104	3 or 4	Reactive energy 4 quadrant	UINT64	1	Kvarh
METER 03	COM1 METER XX.XXX.XXX	108	3 or 4	Power_Factor	UINT32	0,001	
		110	3 or 4	Power_Factor L1	UINT32	0,001	
		112	3 or 4	Power_Factor L2	UINT32	0,001	
		114	3 or 4	Power_Factor L3	UINT32	0,001	
		116	3 or 4	L1 Current Inst value	UINT32	0,1	A
		118	3 or 4	L2 Current Inst value	UINT32	0,1	A
		120	3 or 4	L3 Current Inst value	UINT32	0,1	A
		122	3 or 4	Active Power	INT32	0,1	kW
		124	3 or 4	Active Power L1	INT32	0,1	kW
		126	3 or 4	Active Power L2	INT32	0,1	kW
		128	3 or 4	Active Power L3	INT32	0,1	kW
		130	3 or 4	Reactive Power	INT32	0,1	kvar
		132	3 or 4	L1 Voltage Inst value	UINT32	1	V
		134	3 or 4	L2 Voltage Inst value	UINT32	1	V
		136	3 or 4	L3 Voltage Inst value	UINT32	1	V
		138	3 or 4	Active energy consumed	UINT64	1	KWh
		142	3 or 4	Active energy generated	UINT64	1	KWh
		146	3 or 4	Reactive energy 1 quadrant	UINT64	1	Kvarh
		150	3 or 4	Reactive energy 2 quadrant	UINT64	1	Kvarh
		154	3 or 4	Reactive energy 3 quadrant	UINT64	1	Kvarh
		158	3 or 4	Reactive energy 4 quadrant	UINT64	1	Kvarh
METER 04	COM1 METER XX.XXX.XXX	162	3 or 4	Power_Factor	UINT32	0,001	
		164	3 or 4	Power_Factor L1	UINT32	0,001	
		166	3 or 4	Power_Factor L2	UINT32	0,001	
		168	3 or 4	Power_Factor L3	UINT32	0,001	
		170	3 or 4	L1 Current Inst value	UINT32	0,1	A
		172	3 or 4	L2 Current Inst value	UINT32	0,1	A
		174	3 or 4	L3 Current Inst value	UINT32	0,1	A
		176	3 or 4	Active Power	INT32	0,1	kW
		178	3 or 4	Active Power L1	INT32	0,1	kW
		180	3 or 4	Active Power L2	INT32	0,1	kW
		182	3 or 4	Active Power L3	INT32	0,1	kW
		184	3 or 4	Reactive Power	INT32	0,1	kvar
		186	3 or 4	L1 Voltage Inst value	UINT32	1	V
		188	3 or 4	L2 Voltage Inst value	UINT32	1	V
		190	3 or 4	L3 Voltage Inst value	UINT32	1	V
		192	3 or 4	Active energy consumed	UINT64	1	KWh

		196	3 or 4	Active energy generated	UINT64	1	KWh
		200	3 or 4	Reactive energy 1 quadrant	UINT64	1	Kvarh
		204	3 or 4	Reactive energy 2 quadrant	UINT64	1	Kvarh
		208	3 or 4	Reactive energy 3 quadrant	UINT64	1	Kvarh
		212	3 or 4	Reactive energy 4 quadrant	UINT64	1	Kvarh
METER 05	COM2 METER XX.XXX.XXX	216	3 or 4	Power_Factor	UINT32	0,001	
		218	3 or 4	Power_Factor L1	UINT32	0,001	
		220	3 or 4	Power_Factor L2	UINT32	0,001	
		222	3 or 4	Power_Factor L3	UINT32	0,001	
		224	3 or 4	L1 Current Inst value	UINT32	0,1	A
		226	3 or 4	L2 Current Inst value	UINT32	0,1	A
		228	3 or 4	L3 Current Inst value	UINT32	0,1	A
		230	3 or 4	Active Power	INT32	0,1	kW
		232	3 or 4	Active Power L1	INT32	0,1	kW
		234	3 or 4	Active Power L2	INT32	0,1	kW
		236	3 or 4	Active Power L3	INT32	0,1	kW
		238	3 or 4	Reactive Power	INT32	0,1	kvar
		240	3 or 4	L1 Voltage Inst value	UINT32	1	V
		242	3 or 4	L2 Voltage Inst value	UINT32	1	V
		244	3 or 4	L3 Voltage Inst value	UINT32	1	V
		246	3 or 4	Active energy consumed	UINT64	1	KWh
		250	3 or 4	Active energy generated	UINT64	1	KWh
		254	3 or 4	Reactive energy 1 quadrant	UINT64	1	Kvarh
		258	3 or 4	Reactive energy 2 quadrant	UINT64	1	Kvarh
		262	3 or 4	Reactive energy 3 quadrant	UINT64	1	Kvarh
		266	3 or 4	Reactive energy 4 quadrant	UINT64	1	Kvarh
METER 06	COM2 METER XX.XXX.XXX	270	3 or 4	Power_Factor	UINT32	0,001	
		272	3 or 4	Power_Factor L1	UINT32	0,001	
		274	3 or 4	Power_Factor L2	UINT32	0,001	
		276	3 or 4	Power_Factor L3	UINT32	0,001	
		278	3 or 4	L1 Current Inst value	UINT32	0,1	A
		280	3 or 4	L2 Current Inst value	UINT32	0,1	A
		282	3 or 4	L3 Current Inst value	UINT32	0,1	A
		284	3 or 4	Active Power	INT32	0,1	kW
		286	3 or 4	Active Power L1	INT32	0,1	kW
		288	3 or 4	Active Power L2	INT32	0,1	kW
		290	3 or 4	Active Power L3	INT32	0,1	kW
		292	3 or 4	Reactive Power	INT32	0,1	kvar
		294	3 or 4	L1 Voltage Inst value	UINT32	1	V
		296	3 or 4	L2 Voltage Inst value	UINT32	1	V
		298	3 or 4	L3 Voltage Inst value	UINT32	1	V
		300	3 or 4	Active energy consumed	UINT64	1	KWh
		304	3 or 4	Active energy generated	UINT64	1	KWh
		308	3 or 4	Reactive energy 1 quadrant	UINT64	1	Kvarh
		312	3 or 4	Reactive energy 2 quadrant	UINT64	1	Kvarh
		316	3 or 4	Reactive energy 3 quadrant	UINT64	1	Kvarh
		320	3 or 4	Reactive energy 4 quadrant	UINT64	1	Kvarh
METER 07	COM2 METER XX.XXX.XXX	324	3 or 4	Power_Factor	UINT32	0,001	
		326	3 or 4	Power_Factor L1	UINT32	0,001	
		328	3 or 4	Power_Factor L2	UINT32	0,001	
		330	3 or 4	Power_Factor L3	UINT32	0,001	
		332	3 or 4	L1 Current Inst value	UINT32	0,1	A

		334	3 or 4	L2 Current Inst value	UINT32	0,1	A
		336	3 or 4	L3 Current Inst value	UINT32	0,1	A
		338	3 or 4	Active Power	INT32	0,1	kW
		340	3 or 4	Active Power L1	INT32	0,1	kW
		342	3 or 4	Active Power L2	INT32	0,1	kW
		344	3 or 4	Active Power L3	INT32	0,1	kW
		346	3 or 4	Reactive Power	INT32	0,1	kvar
		348	3 or 4	L1 Voltage Inst value	UINT32	1	V
		350	3 or 4	L2 Voltage Inst value	UINT32	1	V
		352	3 or 4	L3 Voltage Inst value	UINT32	1	V
		354	3 or 4	Active energy consumed	UINT64	1	KWh
		358	3 or 4	Active energy generated	UINT64	1	KWh
		362	3 or 4	Reactive energy 1 quadrant	UINT64	1	Kvarh
		366	3 or 4	Reactive energy 2 quadrant	UINT64	1	Kvarh
		370	3 or 4	Reactive energy 3 quadrant	UINT64	1	Kvarh
		374	3 or 4	Reactive energy 4 quadrant	UINT64	1	Kvarh
METER 08	COM2 METER XX.XXX.XXX	378	3 or 4	Power_Factor	UINT32	0,001	
		380	3 or 4	Power_Factor L1	UINT32	0,001	
		382	3 or 4	Power_Factor L2	UINT32	0,001	
		384	3 or 4	Power_Factor L3	UINT32	0,001	
		386	3 or 4	L1 Current Inst value	UINT32	0,1	A
		388	3 or 4	L2 Current Inst value	UINT32	0,1	A
		390	3 or 4	L3 Current Inst value	UINT32	0,1	A
		392	3 or 4	Active Power	INT32	0,1	kW
		394	3 or 4	Active Power L1	INT32	0,1	kW
		396	3 or 4	Active Power L2	INT32	0,1	kW
		398	3 or 4	Active Power L3	INT32	0,1	kW
		400	3 or 4	Reactive Power	INT32	0,1	kvar
		402	3 or 4	L1 Voltage Inst value	UINT32	1	V
		404	3 or 4	L2 Voltage Inst value	UINT32	1	V
		406	3 or 4	L3 Voltage Inst value	UINT32	1	V
		408	3 or 4	Active energy consumed	UINT64	1	KWh
		412	3 or 4	Active energy generated	UINT64	1	KWh
		416	3 or 4	Reactive energy 1 quadrant	UINT64	1	Kvarh
		420	3 or 4	Reactive energy 2 quadrant	UINT64	1	Kvarh
		424	3 or 4	Reactive energy 3 quadrant	UINT64	1	Kvarh
		428	3 or 4	Reactive energy 4 quadrant	UINT64	1	Kvarh
METER 09	COM3 METER XX.XXX.XXX	432	3 or 4	Power_Factor	UINT32	0,001	
		434	3 or 4	Power_Factor L1	UINT32	0,001	
		436	3 or 4	Power_Factor L2	UINT32	0,001	
		438	3 or 4	Power_Factor L3	UINT32	0,001	
		440	3 or 4	L1 Current Inst value	UINT32	0,1	A
		442	3 or 4	L2 Current Inst value	UINT32	0,1	A
		444	3 or 4	L3 Current Inst value	UINT32	0,1	A
		446	3 or 4	Active Power	INT32	0,1	kW
		448	3 or 4	Active Power L1	INT32	0,1	kW
		450	3 or 4	Active Power L2	INT32	0,1	kW
		452	3 or 4	Active Power L3	INT32	0,1	kW
		454	3 or 4	Reactive Power	INT32	0,1	kvar
		456	3 or 4	L1 Voltage Inst value	UINT32	1	V
		458	3 or 4	L2 Voltage Inst value	UINT32	1	V
		460	3 or 4	L3 Voltage Inst value	UINT32	1	V

		462	3 or 4	Active energy consumed	UINT64	1	KWh
		466	3 or 4	Active energy generated	UINT64	1	KWh
		470	3 or 4	Reactive energy 1 quadrant	UINT64	1	Kvarh
		474	3 or 4	Reactive energy 2 quadrant	UINT64	1	Kvarh
		478	3 or 4	Reactive energy 3 quadrant	UINT64	1	Kvarh
		482	3 or 4	Reactive energy 4 quadrant	UINT64	1	Kvarh
METER 10	COM3 METER XX.XXX.XXX	486	3 or 4	Power_Factor	UINT32	0,001	
		488	3 or 4	Power_Factor L1	UINT32	0,001	
		490	3 or 4	Power_Factor L2	UINT32	0,001	
		492	3 or 4	Power_Factor L3	UINT32	0,001	
		494	3 or 4	L1 Current Inst value	UINT32	0,1	A
		496	3 or 4	L2 Current Inst value	UINT32	0,1	A
		498	3 or 4	L3 Current Inst value	UINT32	0,1	A
		500	3 or 4	Active Power	INT32	0,1	kW
		502	3 or 4	Active Power L1	INT32	0,1	kW
		504	3 or 4	Active Power L2	INT32	0,1	kW
		506	3 or 4	Active Power L3	INT32	0,1	kW
		508	3 or 4	Reactive Power	INT32	0,1	kvar
		510	3 or 4	L1 Voltage Inst value	UINT32	1	V
		512	3 or 4	L2 Voltage Inst value	UINT32	1	V
		514	3 or 4	L3 Voltage Inst value	UINT32	1	V
		516	3 or 4	Active energy consumed	UINT64	1	KWh
		520	3 or 4	Active energy generated	UINT64	1	KWh
		524	3 or 4	Reactive energy 1 quadrant	UINT64	1	Kvarh
		528	3 or 4	Reactive energy 2 quadrant	UINT64	1	Kvarh
		532	3 or 4	Reactive energy 3 quadrant	UINT64	1	Kvarh
		536	3 or 4	Reactive energy 4 quadrant	UINT64	1	Kvarh
METER 11	COM3 METER XX.XXX.XXX	540	3 or 4	Power_Factor	UINT32	0,001	
		542	3 or 4	Power_Factor L1	UINT32	0,001	
		544	3 or 4	Power_Factor L2	UINT32	0,001	
		546	3 or 4	Power_Factor L3	UINT32	0,001	
		548	3 or 4	L1 Current Inst value	UINT32	0,1	A
		550	3 or 4	L2 Current Inst value	UINT32	0,1	A
		552	3 or 4	L3 Current Inst value	UINT32	0,1	A
		554	3 or 4	Active Power	INT32	0,1	kW
		556	3 or 4	Active Power L1	INT32	0,1	kW
		558	3 or 4	Active Power L2	INT32	0,1	kW
		560	3 or 4	Active Power L3	INT32	0,1	kW
		562	3 or 4	Reactive Power	INT32	0,1	kvar
		564	3 or 4	L1 Voltage Inst value	UINT32	1	V
		566	3 or 4	L2 Voltage Inst value	UINT32	1	V
		568	3 or 4	L3 Voltage Inst value	UINT32	1	V
		570	3 or 4	Active energy consumed	UINT64	1	KWh
		574	3 or 4	Active energy generated	UINT64	1	KWh
		578	3 or 4	Reactive energy 1 quadrant	UINT64	1	Kvarh
		582	3 or 4	Reactive energy 2 quadrant	UINT64	1	Kvarh
		586	3 or 4	Reactive energy 3 quadrant	UINT64	1	Kvarh
		590	3 or 4	Reactive energy 4 quadrant	UINT64	1	Kvarh
METER 12	COM3 METER XX.XXX.XX	594	3 or 4	Power_Factor	UINT32	0,001	
		596	3 or 4	Power_Factor L1	UINT32	0,001	
		598	3 or 4	Power_Factor L2	UINT32	0,001	
		600	3 or 4	Power_Factor L3	UINT32	0,001	

		602	3 or 4	L1 Current Inst value	UINT32	0,1	A
		604	3 or 4	L2 Current Inst value	UINT32	0,1	A
		606	3 or 4	L3 Current Inst value	UINT32	0,1	A
		608	3 or 4	Active Power	INT32	0,1	kW
		610	3 or 4	Active Power L1	INT32	0,1	kW
		612	3 or 4	Active Power L2	INT32	0,1	kW
		614	3 or 4	Active Power L3	INT32	0,1	kW
		616	3 or 4	Reactive Power	INT32	0,1	kvar
		618	3 or 4	L1 Voltage Inst value	UINT32	1	V
		620	3 or 4	L2 Voltage Inst value	UINT32	1	V
		622	3 or 4	L3 Voltage Inst value	UINT32	1	V
		624	3 or 4	Active energy consumed	UINT64	1	KWh
		628	3 or 4	Active energy generated	UINT64	1	KWh
		632	3 or 4	Reactive energy 1 quadrant	UINT64	1	Kvarh
		636	3 or 4	Reactive energy 2 quadrant	UINT64	1	Kvarh
		640	3 or 4	Reactive energy 3 quadrant	UINT64	1	Kvarh
		644	3 or 4	Reactive energy 4 quadrant	UINT64	1	Kvarh
METER 13	COM4 METER XX.XXX.XXX	648	3 or 4	Power_Factor	UINT32	0,001	
		650	3 or 4	Power_Factor L1	UINT32	0,001	
		652	3 or 4	Power_Factor L2	UINT32	0,001	
		654	3 or 4	Power_Factor L3	UINT32	0,001	
		656	3 or 4	L1 Current Inst value	UINT32	0,1	A
		658	3 or 4	L2 Current Inst value	UINT32	0,1	A
		660	3 or 4	L3 Current Inst value	UINT32	0,1	A
		662	3 or 4	Active Power	INT32	0,1	kW
		664	3 or 4	Active Power L1	INT32	0,1	kW
		666	3 or 4	Active Power L2	INT32	0,1	kW
		668	3 or 4	Active Power L3	INT32	0,1	kW
		670	3 or 4	Reactive Power	INT32	0,1	kvar
		672	3 or 4	L1 Voltage Inst value	UINT32	1	V
		674	3 or 4	L2 Voltage Inst value	UINT32	1	V
		676	3 or 4	L3 Voltage Inst value	UINT32	1	V
		678	3 or 4	Active energy consumed	UINT64	1	KWh
		682	3 or 4	Active energy generated	UINT64	1	KWh
		686	3 or 4	Reactive energy 1 quadrant	UINT64	1	Kvarh
		690	3 or 4	Reactive energy 2 quadrant	UINT64	1	Kvarh
		694	3 or 4	Reactive energy 3 quadrant	UINT64	1	Kvarh
		698	3 or 4	Reactive energy 4 quadrant	UINT64	1	Kvarh
METER 14	COM4 METER XX.XXX.XXX	702	3 or 4	Power_Factor	UINT32	0,001	
		704	3 or 4	Power_Factor L1	UINT32	0,001	
		706	3 or 4	Power_Factor L2	UINT32	0,001	
		708	3 or 4	Power_Factor L3	UINT32	0,001	
		710	3 or 4	L1 Current Inst value	UINT32	0,1	A
		712	3 or 4	L2 Current Inst value	UINT32	0,1	A
		714	3 or 4	L3 Current Inst value	UINT32	0,1	A
		716	3 or 4	Active Power	INT32	0,1	kW
		718	3 or 4	Active Power L1	INT32	0,1	kW
		720	3 or 4	Active Power L2	INT32	0,1	kW
		722	3 or 4	Active Power L3	INT32	0,1	kW
		724	3 or 4	Reactive Power	INT32	0,1	kvar
		726	3 or 4	L1 Voltage Inst value	UINT32	1	V
		728	3 or 4	L2 Voltage Inst value	UINT32	1	V

		730	3 or 4	L3 Voltage Inst value	UINT32	1	V
		732	3 or 4	Active energy consumed	UINT64	1	KWh
		736	3 or 4	Active energy generated	UINT64	1	KWh
		740	3 or 4	Reactive energy 1 quadrant	UINT64	1	Kvarh
		744	3 or 4	Reactive energy 2 quadrant	UINT64	1	Kvarh
		748	3 or 4	Reactive energy 3 quadrant	UINT64	1	Kvarh
		752	3 or 4	Reactive energy 4 quadrant	UINT64	1	Kvarh
METER 15	COM4 METER XX.XXX.XXX	756	3 or 4	Power_Factor	UINT32	0,001	
		758	3 or 4	Power_Factor L1	UINT32	0,001	
		760	3 or 4	Power_Factor L2	UINT32	0,001	
		762	3 or 4	Power_Factor L3	UINT32	0,001	
		764	3 or 4	L1 Current Inst value	UINT32	0,1	A
		766	3 or 4	L2 Current Inst value	UINT32	0,1	A
		768	3 or 4	L3 Current Inst value	UINT32	0,1	A
		770	3 or 4	Active Power	INT32	0,1	kW
		772	3 or 4	Active Power L1	INT32	0,1	kW
		774	3 or 4	Active Power L2	INT32	0,1	kW
		776	3 or 4	Active Power L3	INT32	0,1	kW
		778	3 or 4	Reactive Power	INT32	0,1	kvar
		780	3 or 4	L1 Voltage Inst value	UINT32	1	V
		782	3 or 4	L2 Voltage Inst value	UINT32	1	V
		784	3 or 4	L3 Voltage Inst value	UINT32	1	V
		786	3 or 4	Active energy consumed	UINT64	1	KWh
		790	3 or 4	Active energy generated	UINT64	1	KWh
		794	3 or 4	Reactive energy 1 quadrant	UINT64	1	Kvarh
		798	3 or 4	Reactive energy 2 quadrant	UINT64	1	Kvarh
		802	3 or 4	Reactive energy 3 quadrant	UINT64	1	Kvarh
		806	3 or 4	Reactive energy 4 quadrant	UINT64	1	Kvarh
METER 16	COM4 METER XX.XXX.XXX	810	3 or 4	Power_Factor	UINT32	0,001	
		812	3 or 4	Power_Factor L1	UINT32	0,001	
		814	3 or 4	Power_Factor L2	UINT32	0,001	
		816	3 or 4	Power_Factor L3	UINT32	0,001	
		818	3 or 4	L1 Current Inst value	UINT32	0,1	A
		820	3 or 4	L2 Current Inst value	UINT32	0,1	A
		822	3 or 4	L3 Current Inst value	UINT32	0,1	A
		824	3 or 4	Active Power	INT32	0,1	kW
		826	3 or 4	Active Power L1	INT32	0,1	kW
		828	3 or 4	Active Power L2	INT32	0,1	kW
		830	3 or 4	Active Power L3	INT32	0,1	kW
		832	3 or 4	Reactive Power	INT32	0,1	kvar
		834	3 or 4	L1 Voltage Inst value	UINT32	1	V
		836	3 or 4	L2 Voltage Inst value	UINT32	1	V
		838	3 or 4	L3 Voltage Inst value	UINT32	1	V
		840	3 or 4	Active energy consumed	UINT64	1	KWh
		844	3 or 4	Active energy generated	UINT64	1	KWh
		848	3 or 4	Reactive energy 1 quadrant	UINT64	1	Kvarh
		852	3 or 4	Reactive energy 2 quadrant	UINT64	1	Kvarh
		856	3 or 4	Reactive energy 3 quadrant	UINT64	1	Kvarh
		860	3 or 4	Reactive energy 4 quadrant	UINT64	1	Kvarh