

BLUE<sup>2</sup> meter

MCS301

Polyphase Modular Meter







# BLUE SQUARE CONCEPT



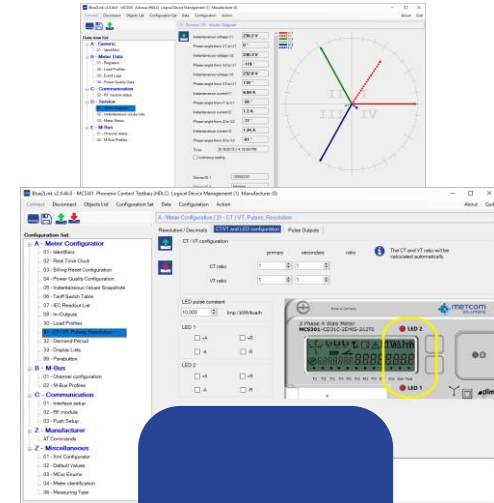
meter

+



comm

+



LINK

BLUE<sup>2</sup> meter

BLUE<sup>2</sup> comm

BLUE<sup>2</sup> LINK

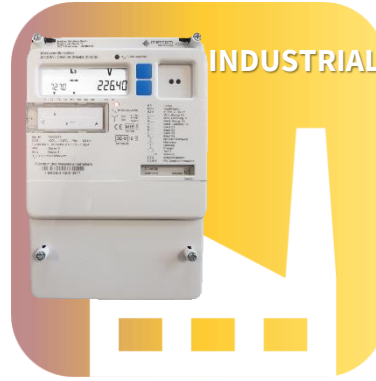


# MCS301 - Meter Portfolio



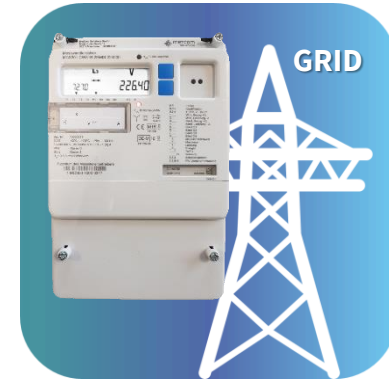
## DC meter type

- Class 1
- 3x230/400V
- 5(100)A
- Multiple load profiles
- Modular communication
- Wired M-Bus interface
- Load control option
- Basic PQ measurement
- DLMS and EN62056-21 protocol



## CT meter type

- Class 0,5S
- 3x230/400V, 3x57,7/100V
- 1(10)A, 5(10)A, etc
- Up to 10 load profiles
- Modular communication
- Simultaneous communication
- Load control option
- Advanced PQ measurement
- DLMS and EN62056-21 protocol



## Wide range CT meter type

- Class 0,2S
- 3x58/100 ... 3x277/480V
- 1(10)A, 5(10)A, etc
- Up to 10 load profiles
- Auxiliary Power Supply option
- Modular communication
- Simultaneous communication
- Advanced PQ measurement
- DLMS and EN62056-21 protocol

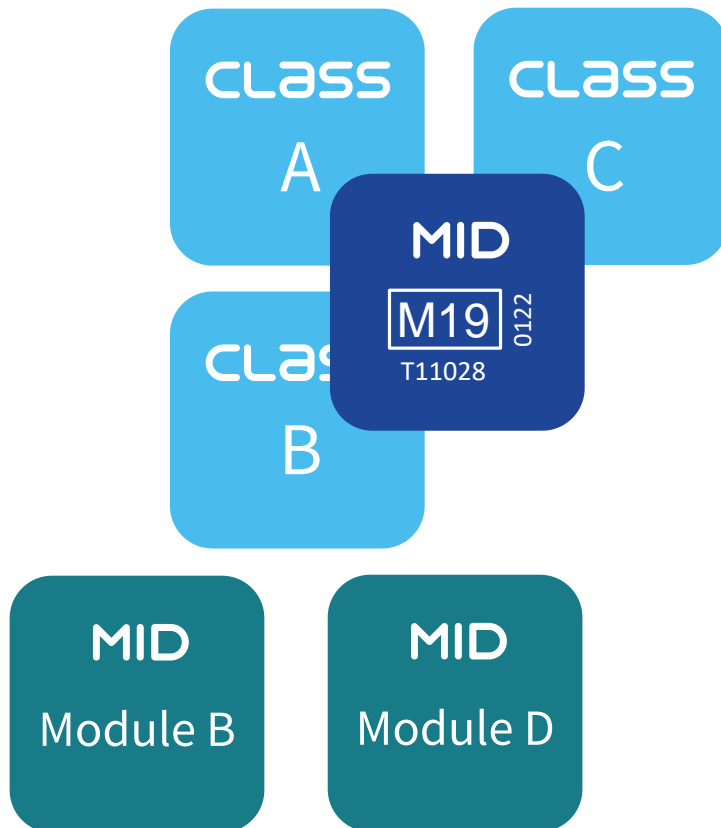


# MCS301 - Meter Portfolio

Segment	Residential	Industry	Grid
<b>Meter type</b>	<b>DC meter</b>	<b>CT and CT/VT meter</b>	<b>CT &amp; CT/VT meter (wide range)</b>
Accuracy class	1	1 / 0.5S/ 0.2S	0.5S / 0.2S
Voltage	3x230/400V	3x230/400V or 3x58/100V	3x58/100 ... 3x277/480V
Current	5(100)A	1(6)A, 1(10)A, 1(15)A	1(6)A, 1(10)A, 1(15)A
Energy & demand tariffs	8 energy, 4 demand tariff	8 energy, 4 demand tariff	8 energy, 4 demand tariff
Auxiliary power supply			48-230V AV or DC
Load profile	6+4 profiles	6+4 profiles	6+4 profiles
Per phase measurement	yes	yes	Yes
RS485 interface	yes	yes	Yes
Modular comms support	yes	yes	yes
Outputs (230V or SO)	1	Up to 6	Up to 6
Mech. Relay output, 10A	Up to 1	Up to 2	Up to 2
Inputs, 230V	0	Up to 2	Up to 2
Power Quality measurement	Yes	Yes	Yes
Wired M-Bus interface	Yes	Yes	Yes
IDIS compliant	Yes	Yes	Yes
DLMS/COSEM protocol	Yes	Yes	Yes
EN62056-21 protocol	Yes	Yes	Yes
NMI certification (MID & IEC)	Yes	Yes	Yes



# MCS301 – MID Certificates



## EU-type examination certificate

Number **T11028** revision 2  
Project number 1901561  
Page 1 of 1

Issued by	NMi Certin B.V., designated and notified by the Netherlands to perform tasks with respect to conformity modules mentioned in article 17 of Directive 2014/32/EU, after having established that the Measuring instrument meets the applicable requirements of Directive 2014/32/EU, to:
Manufacturer	MetCom Systems GmbH Marie-Curie-Strasse 19 D-68219 Mannheim Germany
Measuring instrument	A static <b>Active Electrical Energy Meter</b>
Type	: MCS301
Manufacturer's mark or name	: MetCom
Reference voltage	: 1x/3x/100 V, 1x/2/3x/400 V or 1x/3x/100 V .... 1x/2/3x/400 V
Reference current	: 1 A or 5 A (CT version) 5 A or 10 A (DC version)
Destined for the measurement of	: electrical energy, in a - three-phase four-wire network
Accuracy class	: A or B (DC version) B or C (CT version)
Environment classes	: M1 / E2
Temperature range	: -40 °C / +70 °C
Further properties are described in the annexes:	
- Description	T11028 revision 2;
- Documentation	folder T11028-3.
Valid until	16 October 2027
Remark	This revision replaces the earlier version, including its documentation folder.

Issuing Authority **NMi Certin B.V., Notified Body number 0122**  
26 March 2018

C. Oosterman  
Head Certification Board

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This document is issued under the provision that no liability is accepted and that the manufacturer shall indemnify third party liability.

The registration of NMI Certin B.V. as notified body can be verified at <http://ec.europa.eu/euipo/notifyaprocedure/index/>

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# MCS301 – IEC/EN Certificates



## Certificate of Conformity

No. CoC-1901561-01

<b>Applicant</b>	: MelCom Systems GmbH Marie-Curie-Strasse 19 D-68219 Mannheim Germany	<b>Issued by</b>	: NMI Certin B.V. Hugo de Grootplein 1 3314 EG DORDRECHT The Netherlands
<b>Submitted</b>	: <b>Static electrical energy meter</b>		
<b>Manufacturer</b>	: <b>Melcom</b>		
<b>Type</b>	: <b>MCS301</b>		
<b>Characteristics</b>	: reference voltage : 3x58/100 V, 3x230/400 V, 3x58/100 ... 3x240/415 V reference current : 1 A or 5 A (CT) 5 A or 10 A (DC) maximum current : 2 A, 5 A, 6 A or 10 A (CT) 80 A or 100 A (DC) class : 0,5S or 0,2S for active energy (CT) (IEC 62053-21) C or B for active energy (CT) (EN50470-3) 1 or 2 for reactive energy (CT) (IEC 62053-24) 1 or 2 for active energy (DC) (IEC 62053-21) B or A for active energy (DC) (EN50470-3) 2 for reactive energy (DC) (IEC 62053-23)		
<b>destined for the measurement of</b>	: electrical energy, in a - three-phase four-wire system		
<b>In accordance with</b>	: - IEC 62052-11 "Electricity metering equipment (AC) - General requirements, tests and test conditions - Part 11: Metering equipment" - IEC 62053-22 "Electricity metering equipment (AC) - Particular requirements - Part 22: Static meters for active energy (classes 0.2 S and 0.5 S)" - IEC 62053-23 "Electricity metering equipment (AC) - Particular requirements - Part 23: Static meters for reactive energy at fundamental frequency (classes 2 and 4)" - IEC 62053-24 "Electricity metering equipment (AC) - Particular requirements - Part 24: Static meters for reactive energy at fundamental frequency (classes 0.5 S, 1 S and 1)" - EN 50470-1 "Electricity metering equipment (a.c.) - General requirements, tests and test conditions - Part 1: Metering equipment (class indexes A, B and C)" - EN 50470-3 "Electricity metering equipment (a.c.) - Particular requirements - Part 3: Static meters for active energy (class indexes A, B and C)" - CENELEC TR 50579 "Electricity metering equipment - Severity levels, immunity requirements and test methods for conducted disturbances in the frequency range 2 - 150 kHz"		

The described products are tested according to the above mentioned product standards and meet the essential requirements, based on a non-recurrent examination. The appertaining test data is presented in type evaluation report no. NMI-1900620-01, NMI-1901561-01 and NMI-1901561-02 granted by NMI and test report no. 713125582, issued by TUV SUD.  
26 March 2018  
NMI Certin B.V.

C. Oosterman  
Head Certification Board

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Parties concerned can lodge objection against this decision, within six weeks after the date of submission, to the general manager of NMI (see "Regulation objection and appeal against decisions of NMI").

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IEC/EN  
62052-11

IEC/EN  
62053-23

IEC/EN  
62053-24

IEC/EN  
62053-21

CLASS  
1

IEC/EN  
62053-22

CLASS  
0.2S

CLASS  
0.5S



# MCS301 – Main Features

- ✓ High accuracy and measurement capabilities
- ✓ DLMS and EN62056-21 protocol support
- ✓ Security concept with HLS or LLS
- ✓ Advanced load profile & log files
- ✓ Advanced Power Quality functionality
- ✓ Real time monitoring
- ✓ Flexible modular communication
- ✓ Remote FW download possibility
- ✓ M-Bus interface, supporting up to 4 slave meters
- ✓ User-friendly reading and configuration tool
- ✓ Made in Germany product





# MCS301 – Main Features



## Measurement

- ✓ Higher accuracy and stability
- ✓ Available as class 0.5S and 0.2S
- ✓ Power supply
- ✓ Dedicated power supply or
- ✓ Wide range power supply 3x58/100 ... 3x277/480V
- ✓ Active, reactive and apparent energy measurement
- ✓ Advanced PQ measurement incl. harmonics & THD
- ✓ Measurement, total and per phase
- ✓ Optional auxiliary power supply 48-230V AC/DC

## DLMS protocol and IDIS package 2 application

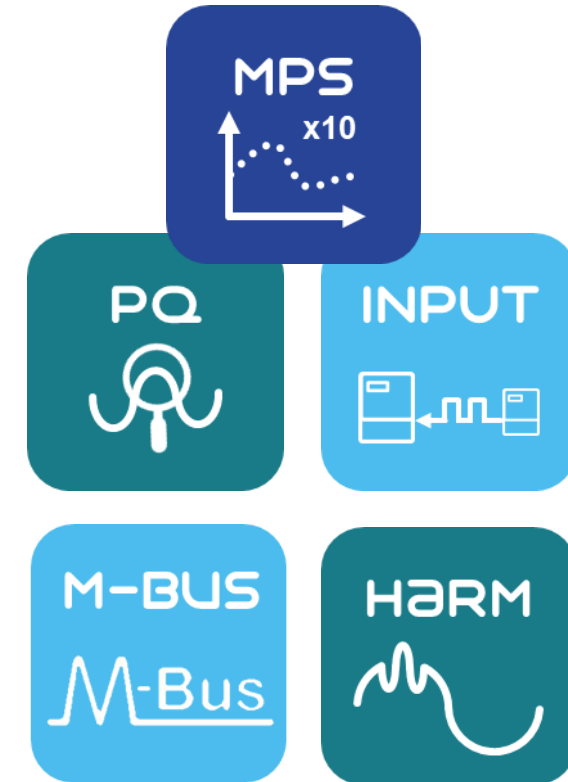
- ✓ DLMS implementation acc. the newest Green and Blue book
- ✓ Additional support of EN62056-21 protocol
- ✓ Supporting LLS (low level security) and HLS (High level security)
- ✓ FW upgrade of the meter application by optical, electrical or remote interface



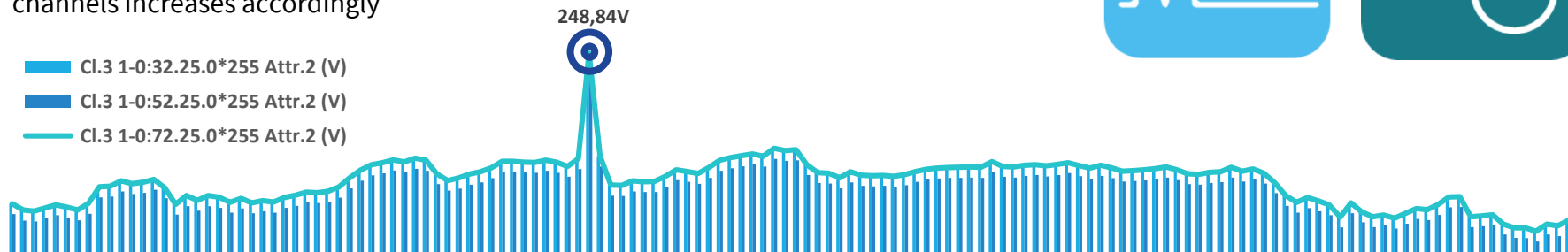
# MCS301 –Multiple Profile Sets

Measurement of max. 10 Sets Profiles Sets with a total of 154 Channels distributed for: Load, Instrumentation, Power Quality, Harmonics and M-Bus Profiles

Profile Type	Description	Max. channels*	Capture Time	Storing Time
<b>Load Profile 1</b>	Energy values	12	15 min	94 Days
<b>Load Profile 2</b>	Daily Billing Data	42	24 hours	180 Days
<b>Avg. PQ Profile</b>	Power Quality	14	10 min	31 Days
<b>Min. PQ Profile</b>	Power Quality	14	10 min	31 Days
<b>Max. PQ Profile</b>	Power Quality	14	10 min	31 Days
<b>Harmonics Profile</b>	Harmonics	42	10 min	31 Days
<b>M-bus or Pulse Input 1</b>	External device 1	4	24 hours	62 Days
<b>M-bus or Pulse Input 2</b>	External device 2	4	24 hours	62 Days
<b>M-bus or Pulse Input 3</b>	External device 3	4	24 hours	62 Days
<b>M-bus or Pulse Input 4</b>	External device 4	4	24 hours	62 Days



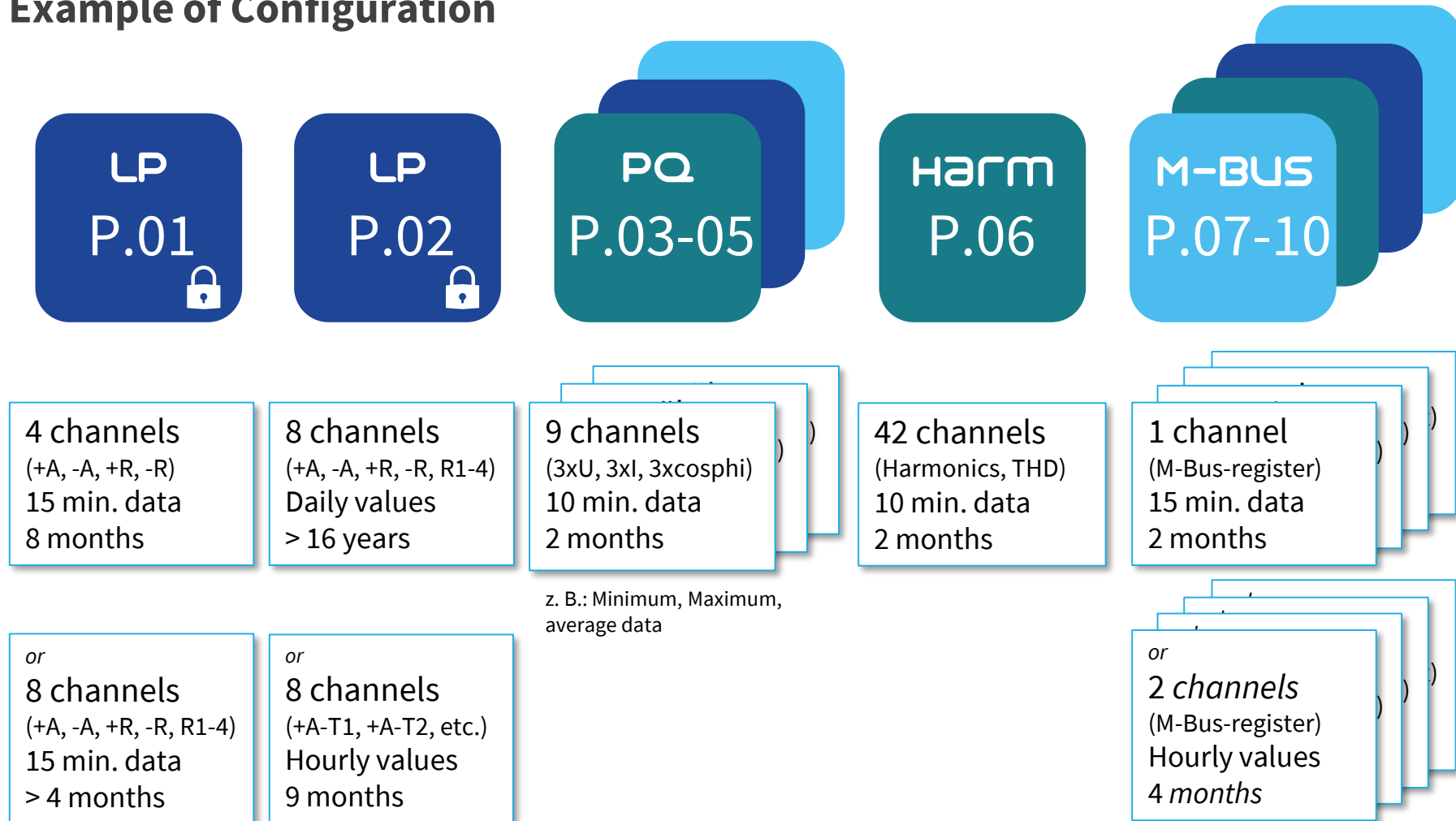
**\*Remark:** In case the number of channels is decreased the size for the remaining channels increases accordingly





# MCS301 –Multiple Profile Sets

## Example of Configuration



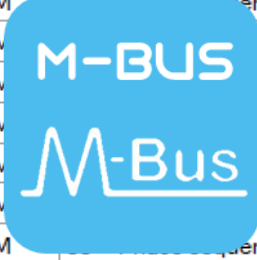





# MCS301 –Advance Log Books

## 9 Independent Logs for every Event type

- ✓ Standard Event log Up to 580 events
- ✓ Fraud Detection log Up to 580 events
- ✓ Communication log Up to 580 events
- ✓ Power Failure log Up to 400 events
- ✓ Power Quality log Up to 580 events
- ✓ Disconnecter Control log Up to 580 events
- ✓ M-Bus log Up to 580 events
- ✓ Active Energy Event log Customizable
- ✓ Custom Message log Customizable

	0-0:96.11.0*255, 2 (Event Object -Standard Event Log)
	255 -- Event log cleared
	216 -- Factory reset
	11 -- Alarm Register Cleared
	11 -- Alarm Register Cleared
	10 -- Error Register Cleared ...
	1/9/2019 4:20:32 PM Error Register Cleared ...
	1/9/2019 4:20:32 PM Alarm Register Cleared
	1/9/2019 4:20:32 PM Alarm Register Cleared
	1/9/2019 4:20:32 PM Error Register Cleared ...
	1/9/2019 4:20:32 PM Alarm Register Cleared
	1/9/2019 4:20:32 PM Alarm Register Cleared
	1/9/2019 4:20:32 PM Error Register Cleared ...
	1/11/2019 4:20:32 PM Phase sequence reversal
	1/16/2019 4:20:32 PM Phase sequence reversal
	1/21/2019 4:57:12 PM Phase sequence reversal
	1/21/2019 4:58:41 PM Phase sequence reversal
	1/21/2019 4:59:17 PM Phase sequence reversal
	1/21/2019 4:59:25 PM Phase sequence reversal
	1/21/2019 5:02:28 PM Phase sequence reversal
	1/21/2019 5:05:42 PM Phase sequence reversal
	1/21/2019 5:05:59 PM Phase sequence reversal
	1/21/2019 5:06:04 PM 88 -- Ph
	1/21/2019 5:06:06 PM 88 -- Ph
	1/21/2019 5:08:05 PM 88 -- Ph
	1/21/2019 5:08:53 PM 1 -- Por
	1/21/2019 5:09:02 PM 2 -- Por
	1/21/2019 5:09:03 PM 88 -- Ph



# MCS301 – Power Quality – PQ (1/2)

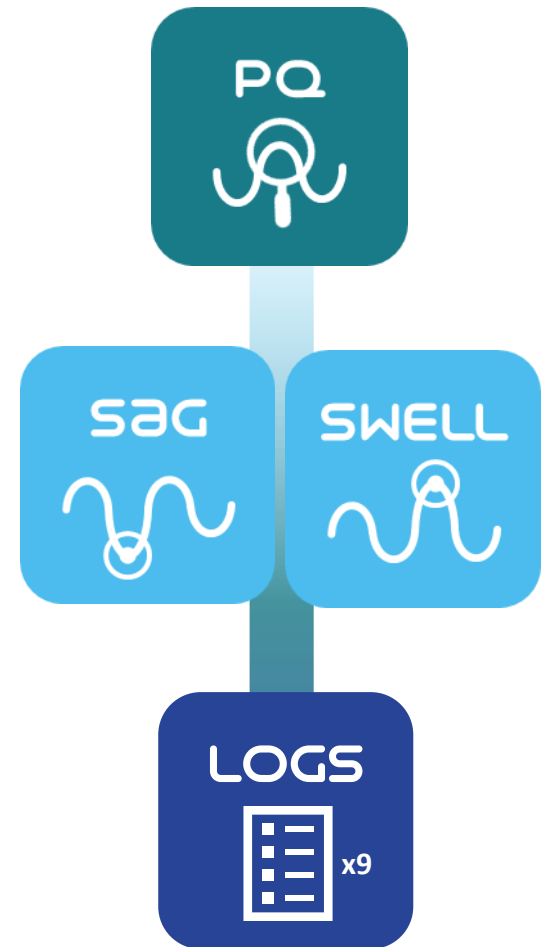
## Advanced PQ measurement

### Under / Over voltage (sags / swells) parameter

- Threshold for Under Voltage (-5% ...-20%)
- Threshold for Over Voltage (+5% ...+15%)
- Time Threshold for Over Voltage (1 ... 60s)
- Time Threshold for Under Voltage (1...180s)

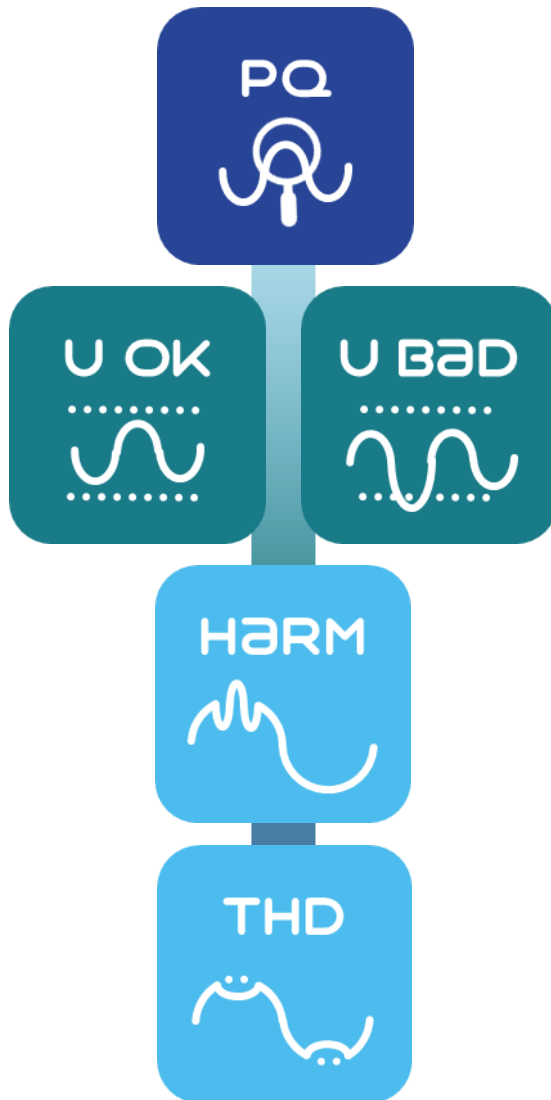
If any “**Under voltage**” or “**Over Voltage**” happens, an event will be logged in the power quality event log with time and date

- Number of Under Voltage in Phase L1, L2, L3
- Duration of Last Under Voltage in Phase L1, L2, L3
- Magnitude of Last Under Voltage in Phase L1, L2, L3
- Number of Over Voltage in Phase L1, L2, L3
- Duration of Last Over Voltage in Phase L1, L2, L3
- Magnitude of Last Over Voltage in Phase L1, L2, L3





# MCS301 – Power Quality – PQ (2/2)



## Voltage level monitoring (see EN50160)

### ◦ ULx Normal:

During each period of 1 week 95 % of ULx average (10min interval) shall be within the range of  $U_n \pm 10\%$ ; and all ULx average shall be within the range of  $U_n$  as defined in EN50160.

### ◦ ULx Bad: Any other cases

◦ In case of “ULx Bad” voltage, an event will be generated regarding each phase.

- Event for Bad Voltage Quality L1
- Event for Bad Voltage Quality L2
- Event for Bad Voltage Quality L3

◦ Remark: the calculations are based on the average voltage values (10min values)

## Harmonic measurement

◦ The meter provides harmonic measurement up to the 15<sup>th</sup> harmonic

- Voltage per phase (L1, L2, L3) for 3./5./7./9./11./13./15. harmonic
- Current per phase (L1, L2, L3) for 3./5./7./9./11./13./15. harmonic

## THD measurement

◦ The meter provides a THD measurement up to the 32<sup>th</sup> harmonic

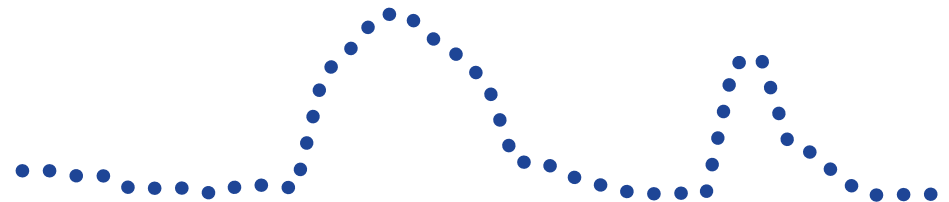
- Voltage per phase (L1, L2, L3)
- Current per phase (L1, L2, L3)

$$\frac{\sqrt{(V_{rms\_total}^2 - V_{rms\_fundamental}^2)}}{V_{rms\_fundamental}}$$



# MCS301 – Real Time Monitoring

Support of reading data every 1s (Snapshots) in 2 sets:



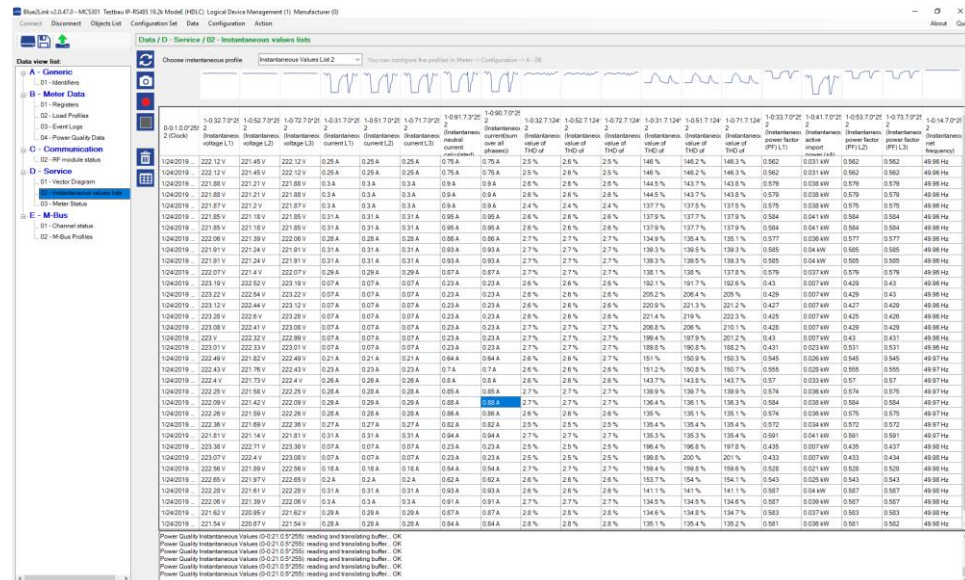
## 1. Power of Quality data (up to 42)

- Voltage, current
- Harmonics, THD
- Others

## 2. Instantaneous consumption data (up to 42)

- Active demand
- Reactive demand,
- Others

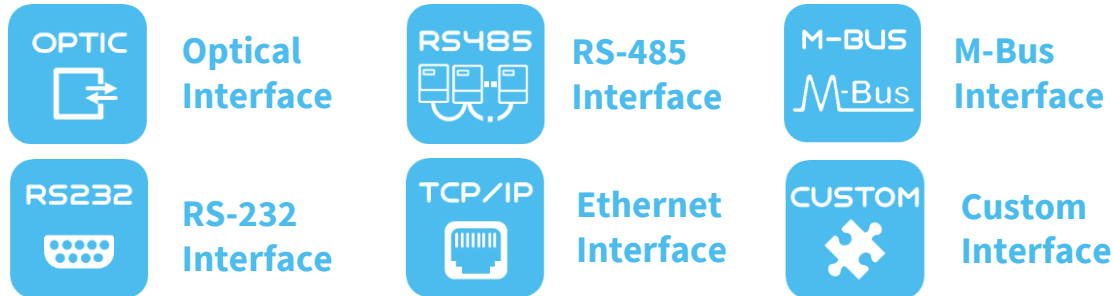
to analyze the connected devices and to be able to detect high consumption devices





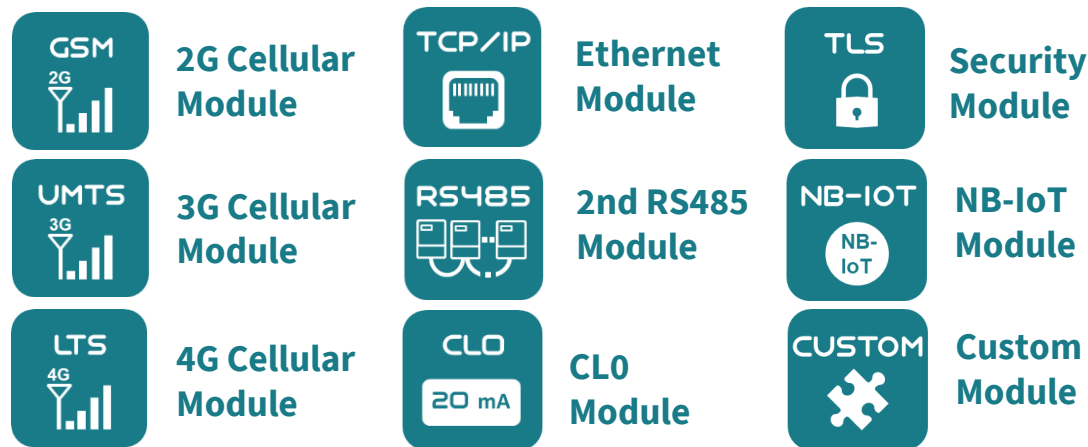
# MCS301 - Flexible Communication

## On-board Communication Interfaces:



BLUE<sup>2</sup> comm

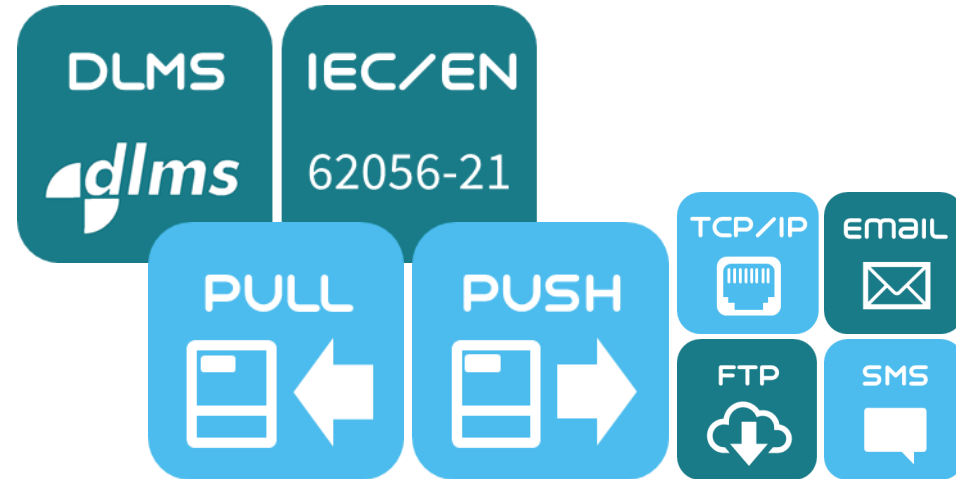
## Exchangeable Communication Modules:





# MCS301 - Flexible Communication

## Parallel and Multiple Communication Protocols:

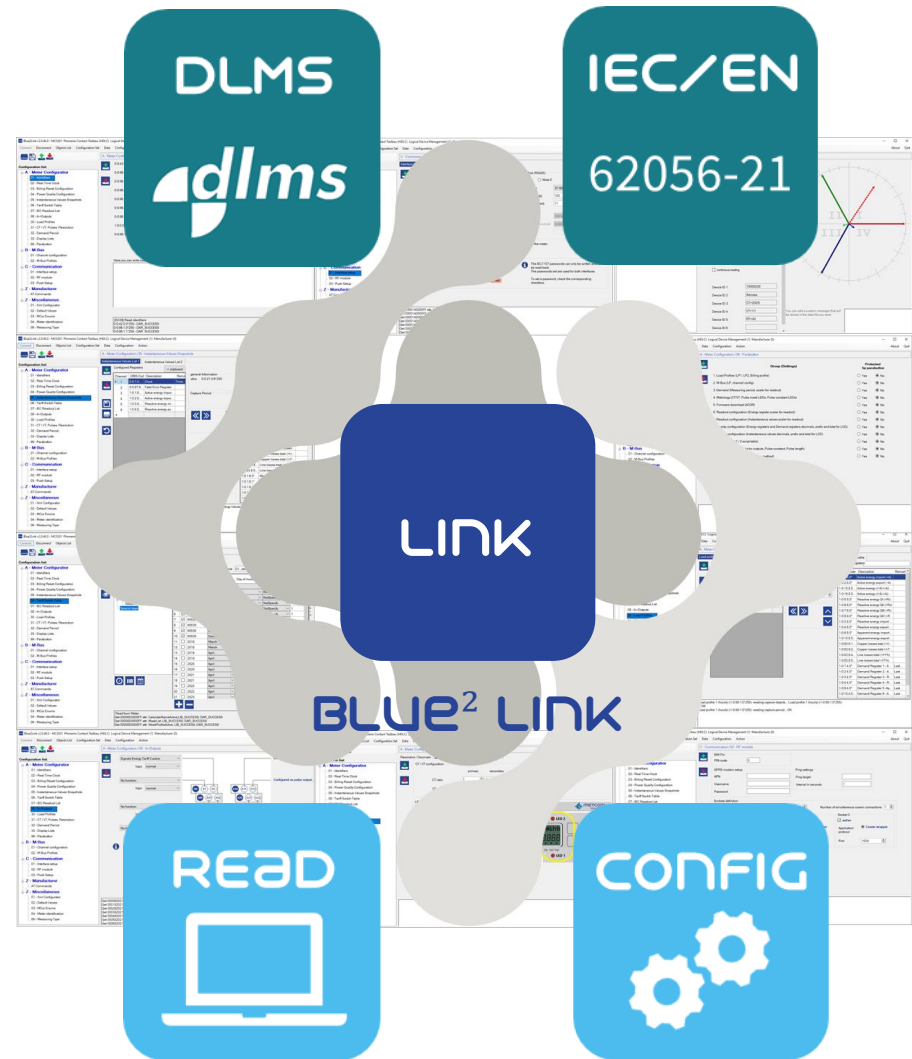


- ✓ Reading “Pull“ up to 3 Sockets in paralel
- ✓ “Push” data to 5 different targets (FTP, TCP, UDP, Mail or SMS)
- ✓ Push format (DLMS or EN62056-21)
- ✓ Push trigger: Time or event controlled
- ✓ Push content individual configurable



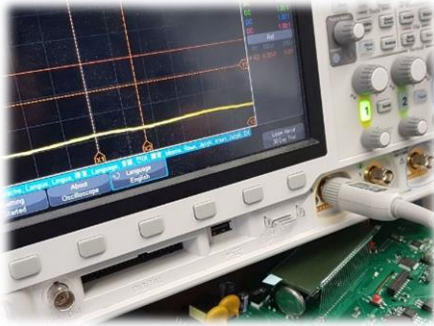
# MCS301 – Configuration Tool

- user-friendly tool
- support of communication via
  - optical interface
  - electrical interface
  - any IP based communication
- support of LLS and HLS communication
- Reading of all configuration parameters
- Reading of
  - any register data
  - up to 10 different load profiles
  - up to 7 different log files
- monitoring PQ data (U, I, harmonics, THD, ..)
- Change of meter configuration
- Communication settings
- Exporting all reading data in csv Format
- FW download of application part of the meter





# MCS301 – Made in Germany



■ **MADE**  
■ **IN**  
■ **GERMANY**



Development  
Quality  
Production



# Questions?

We are based in Mannheim,  
Germany about 85km south  
of Frankfurt, close to  
Highway A6.



Marie-Curie-Str. 19  
68219 Mannheim Germany



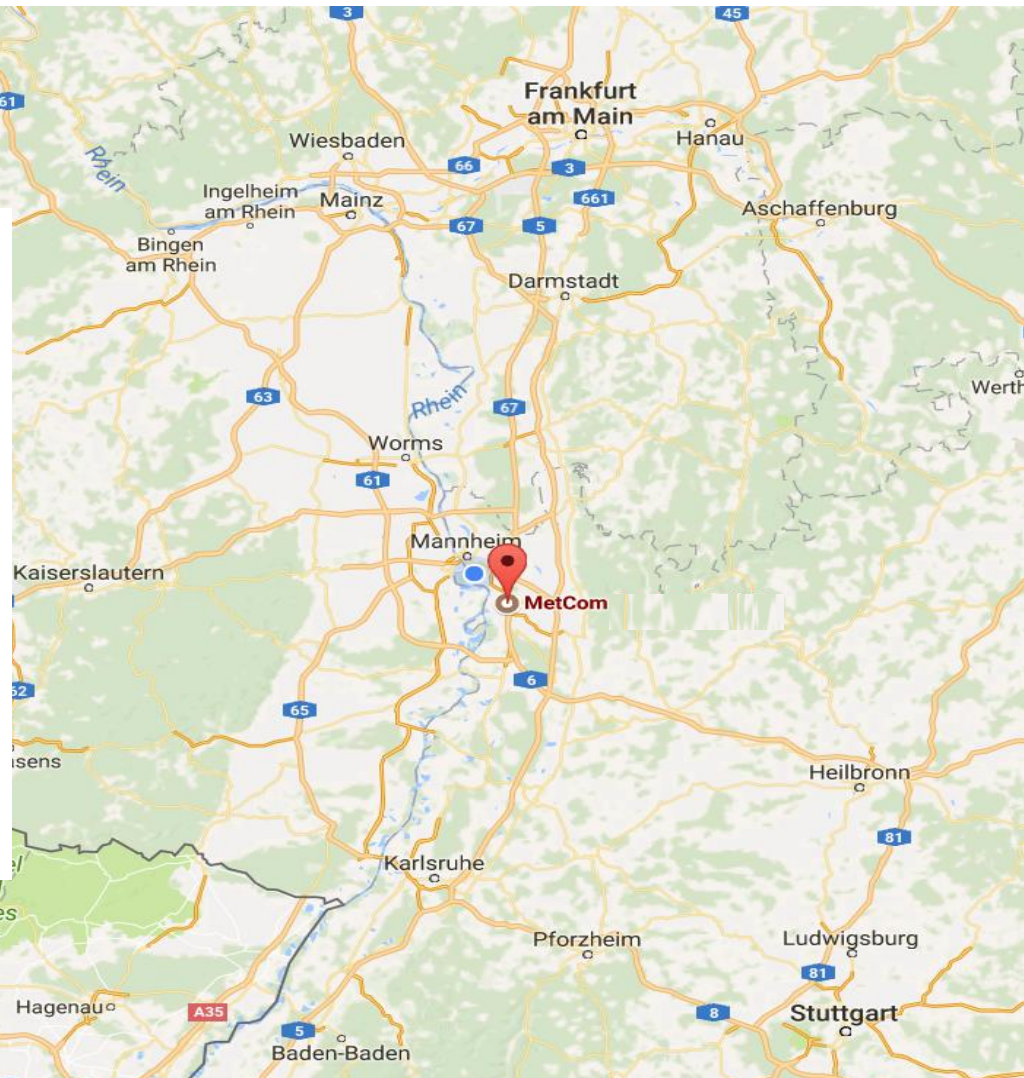
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Thank You!

