

PRODUCT FAMILY

MCM INTELLI-X

MODULAR I/O SYSTEM – SCALABLE, SUITABLE FOR DECENTRALISED DEPLOYMENT, HIGHLY ROBUST
– OPTIMISED FOR TESTING BATTERIES AND FUEL CELLS



BE SMARTER

The measurement and simulation modules in the MCM Intelli-X product family are suitable for a wide range of applications, including laboratories, test benches and mobile testing applications. They share a number of common features:

- ▶ **High-voltage insulation:** Galvanically isolated signal channels ensure safe and interference-free operation even at high system voltages (> 1000 V DC).
- ▶ **Synchronised and HiL-compatible:** All channels are precisely synchronised, and the modules can be integrated into real-time environments.
- ▶ **Modular & scalable:** measurement and simulation modules can be flexibly combined, from just a few channels up to several hundred.
- ▶ **Fail-safe:** Integrated signal conditioning ensures short-circuit-proof I/O.
- ▶ **Universal:** A wide-range power supply, extended temperature range (< -20 to +85 °C, optionally -40 to 105 °C) and mobile operation enable both fixed and portable systems.
- ▶ **Integration-friendly:** Hardware interfaces including CAN, USB, Ethernet and EtherCAT, as well as an open Python-based software interface, enable easy integration.

MCM INTELLI-X: A MODULAR SYSTEM WITH COUNTLESS POSSIBILITIES

The MCM Intelli-X I/O product family offers unlimited flexibility in the smallest of spaces. And all at extremely competitive prices.

MEASURE

Measurement of cell voltages, sensor signals and electrical parameters – precise, synchronised and galvanically isolated.

SIMULATE

Simulation of cell voltages, sensor signals and control variables for reproducible test scenarios.

COMBINE

Measurement and simulation in a single system – flexibly configured to meet changing requirements.

FIELDS OF APPLICATION



Batteries

Our Intelli-X modules are used, amongst other things, in the testing of battery management systems. Here, the systems stand out for their scalability, which allows for a very large number of measurement channels.



Test benches for E-components

The measurement and simulation modules feature galvanic signal isolation, cascading capability and a range of interfaces. As a result, they can be easily adapted to meet all typical test bench requirements.



Fuel cells

These measurement modules have now proven their worth thousands of times over in monitoring individual cell voltages in fuel cell stacks and deliver reliable results even under harsh environmental conditions.

BUILD YOUR OWN MIXED SIGNAL MEASUREMENT AND SIMULATION STACK!

#1 Initial module



#2 Customised fit-out



#3 Configured stack



THE INTELLI-X MODULES IN DETAIL

Measurement module MCM IntelliProbe U10AII

Ten voltage measurement inputs for serially connected cell voltages (fuel cells, electrolyzers, etc.).

Measurement module MCM IntelliProbe U02AII

Two individually galvanically isolated voltage measurement inputs with active low-pass filters, each with three measurement ranges, for general signal acquisition (sensor signals, current measurement via shunt, etc.).

Measurement module MCM IntelliProbe U02AII-AC

Two individually galvanically isolated AC measurement inputs with bandpass filters, each with five measurement ranges, for the time-synchronous measurement of current and AC voltage in high-voltage fuel cell stacks for impedance determination.

Options

- ▶ All modules are available in both a sealed IP65 enclosure and a light-frame enclosure for improved ventilation.



Initial module MCM IntelliProbe Link V3 / V4

The Link module is the first module in an Intelli-X module stack and provides the connectors for bus communication and the supply voltage, as well as protection against over-voltage and reverse polarity.

Version V3, featuring ODU connectors, offers an IP65-rated variant for installing modules in damp environments.

V4 is equipped with standard industrial connectors for easy assembly of the connection cables and reduced space requirements.

Option MCM IntelliProbe InterLink

- ▶ The Interlink module allows the cables at the end of one stack of modules to be connected to the next stack, for example when several module packs are to be positioned in separate locations.

Simulation module MCM IntelliSim U06AOI

Six individually galvanically isolated voltage outputs for a wide range of applications, such as cell voltage simulation for electrochemical cells (e.g. batteries, fuel cells), signal simulation for sensors (e.g. NTC, physical sensors with voltage output), and control of power supplies with analogue inputs.

Options

- ▶ Shunt simulation: Use of one channel of the module for an output voltage range to simulate shunt voltage (typically ± 100 mV; other ranges are possible).
- ▶ Current loop: Application of one channel of the module for a constant-current-controlled bidirectional control output for current loops up to 30 mA.



Process modules MCM Master / SlimMaster:

Master modules are required when operating module stacks with a higher number of channels and higher clock rates. They enable high-speed data transmission to a PC/host via Ethernet or EtherCAT. When operating with a master module, the modules switch their data stream from the CAN bus to a fast local bus and operate in synchronisation with the master via the master clock.

The difference between the module variants lies in the IP65-rated sealing and EtherCAT capability of the MCM Master. The SlimMaster, on the other hand, is more cost-effective and smaller. It is designed for laboratory and test bench applications.

Booster module MCM U06ABI

The 6-channel power driver can, for example, be used to supplement the balancing currents for cell voltage simulation. Thanks to the four-quadrant operation of the booster module, the channels can also be used as small, adjustable power supplies with fast response times, for example to simulate voltage ramps or rapid interruptions.



MCM Intelli-X Pre-assembled cable harnesses

Given the wide range of possible applications, we offer a comprehensive selection of high-voltage-rated measurement signal cables and communication/power cables for the link modules. We can produce customised assemblies in consultation with our customers. Please feel free to seek advice from our specialists.

BE SMARTER
And call us.

SMART TESTSOLUTIONS GmbH
Stuttgart office

Rötestrasse 17
70197 Stuttgart

T: +49 711 25521-10
F: +49 711 25521-12
M: info@smart-ts.de

www.smart-testsolutions.de

