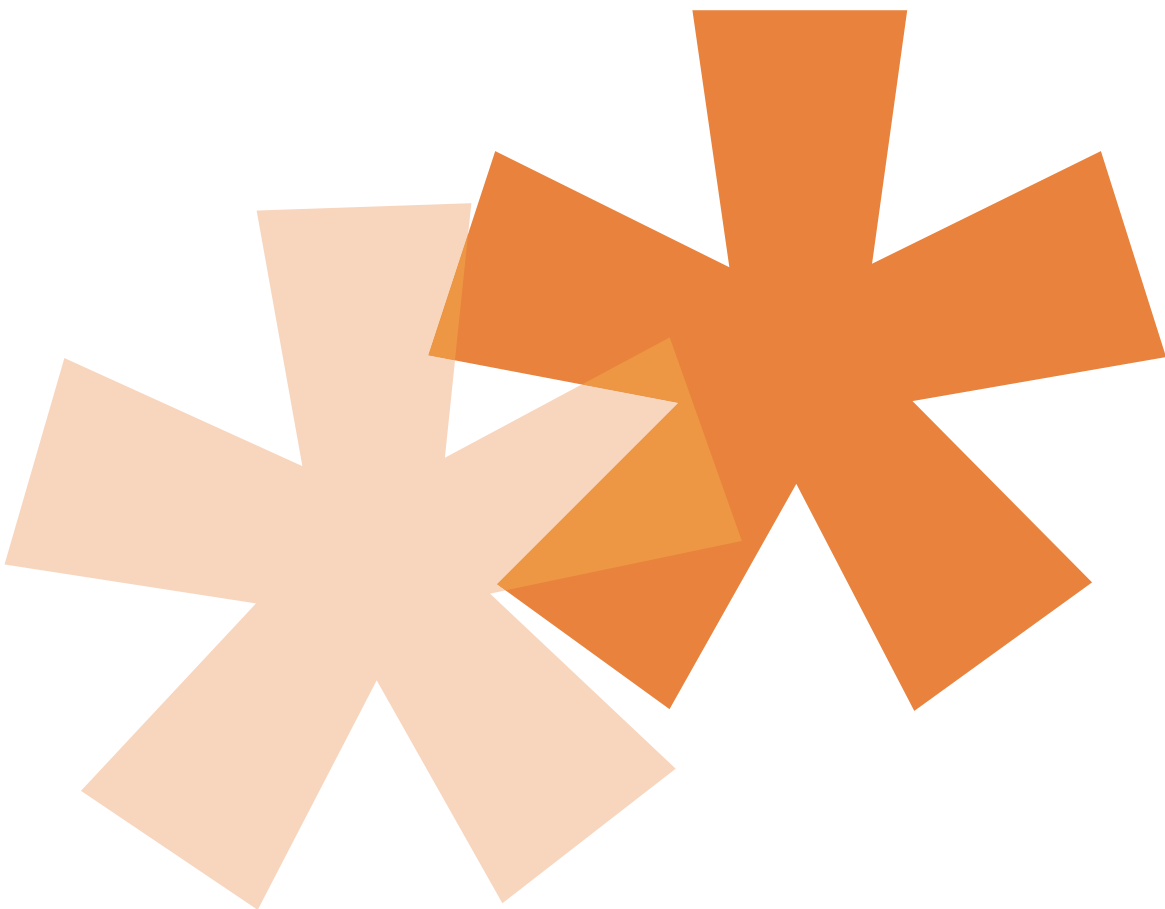




# **Microelectrode Array Systems System Suggestions**



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## About MEA-Systems

Multi Channel Systems MCS GmbH provides complete solutions for stimulation, recording, data acquisition and analysis. The MEA product line is perfect for *in vitro* applications, that is, acute slices, cultured tissues, and cells on microelectrode arrays (MEAs).

This guide gives you an overview over the various products and possible combinations. The illustrations show how the devices are connected in a setup. These setups are to be understood as suggestions; you can define your custom setup as well. This documentation also does not show all possible setups and complete systems. Please refer to the separate documentation to obtain more detailed information about single components, installation, or operating issues. Do not hesitate to contact MCS or your local retailer if you are interested in a particular setup or if you have other questions.

## Data Acquisition and Analysis

The MEA60-System is a complete system for *in vitro* recording from microelectrode arrays (MEAs), MEA perfusion, and data acquisition from up to 64 channels. Raw data from up to 60 MEA electrodes is amplified by a MEA1060 amplifier, and then acquired by the MC\_Card of the connected computer. Recorded data is graphed, analyzed, reviewed, and exported with powerful and easy-to-use MC\_Rack.

The temperature controller TC01/02 regulates the MEA temperature. MEA60-System-E is an alternative version of the system with an extended perfusion system, featuring a perfusion cannula PH01 with programmable fluid temperature and a two-channel temperature controller TC02. The computer supplies power via the IPS10W for all devices of the setup, except the temperature controller and the stimulus generator. MCS standard cables C68x3M (3 meters), C68x1M (1 meter), or C68x0.5M (0.5 meter) are used for connecting the channels.

The ME120-System has a MC\_Card extension that allows recording from two MEAs with 120 electrodes in total. Combined with a MEAS4/2, you can even record from four MEAs simultaneously. Choose any of the up to 120 recording channels conveniently by mouse-click with the MEA\_Switch software. Or use a MEAS2/1 to select up to 60 channels from two MEAs with a standard MEA60-2-System or MEA60-2-System-E. Please note that the power for those systems that use a MEA Switch is provided by the external power supply PS40W, not the IPS10W.

All systems are available either for inverted microscopes or for upright microscopes, MEA60-Inv-System and MEA60-Up-System, respectively.

The optional signal divider SD-MEA allows to select any channel and view it with an external oscilloscope.

## Stimulation and Triggering

The flexible MC\_Stimulus software enables complex stimulus waveforms (both current and voltage). waveforms designed in the program or imported from an external file are converted by a stimulus generator into pulses, which are sent to stimulating electrodes.

If you prefer the MEA1060-BC amplifier, software controls allow you to select any electrode on a MEA for stimulation and recording. A blanking (TTL) signal switches off stimulating electrodes during stimulation and thus suppresses stimulus artifacts.

Stimulation and recording can be synchronized with a digital trigger signal (TTL) sent from the digital Sync Out output of the STG to the MC\_Card via the 3 digital BNC inputs of the data acquisition computer. For more advanced trigger setups, you can obtain the digital in/out (Di/o) extension as an accessory. It provides the access to all 16 digital input and output bits via BNC.

## Setups in this Guide — Overview

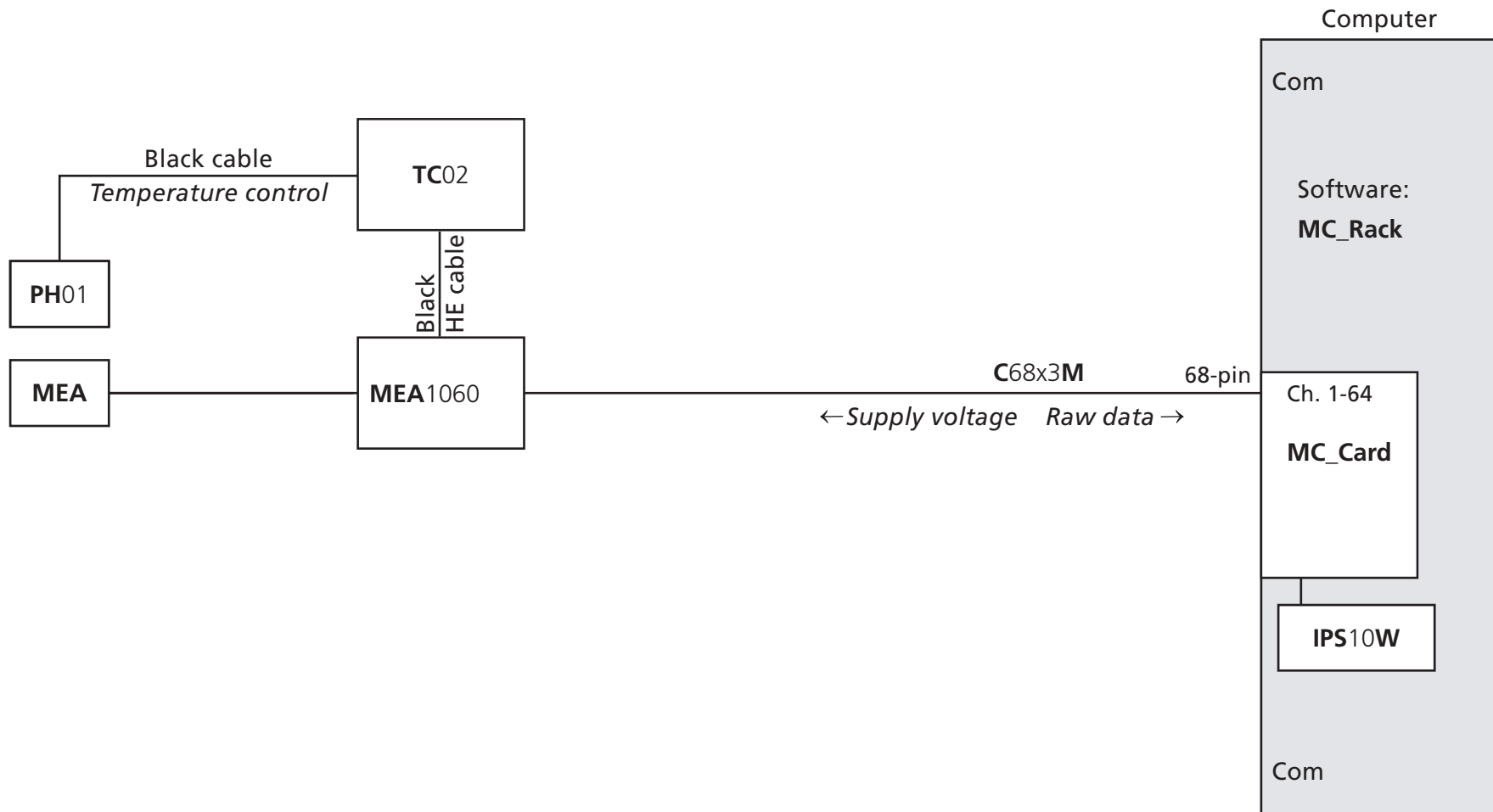
### MEA-Systems with data transfer via serial port to the MC\_Card installed in the data acquisition computer

\* = Not included in the MEA-System, has to be ordered separately

	<b>MEA</b> <i>Microelectrode array</i>	<b>TC01/02</b> <i>1- or 2-channel temperature controller</i>	<b>PH01</b> <i>Perfusion cannula with programmable temperature</i>	<b>MEA1060- Inv/Up</b> <i>60-Channel amplifier</i>	<b>MEA1060- Inv/Up-BC</b> <i>60-Channel amplifier stimulus artifact suppression</i>	<b>MEA Switch</b> <i>Switching channels of amplifier pairs</i>	<b>Channel No.</b> <i>Data acquisition analog channels</i>	<b>STG*</b> <i>Stimulation</i>
<b>MEA60-System</b>	5 x	1 x TC01		1 x			64	
<b>MEA60-System-E</b>	5 x	1 x TC02	1 x	1 x			64	
<b>MEA60-2-System</b>	5 x	1 x TC02		2 x		MEAS2/1	64	
<b>MEA60-2-System-E</b>	5 x	1 x TC02	2 x	2 x		MEAS2/1	64	
<b>MEA120-2-System</b>	5 x	1 x TC02		2 x			128	
<b>MEA120-2-System-E</b>	5 x	1 x TC02	2 x	2 x			128	
<b>MEA120-4-System</b>	5 x	1 x TC02			4 x	MEAS4/2	128	
<b>MEA120-4-BC-System</b>	5 x	1 x TC02			4 x	MEAS4/2	128	
<b>MEA60-BC-System + STG</b>	5 x	1 x TC01			1 x		64	X
<b>MEA60-BC-System-E + STG</b>	5 x	1 x TC02	1 x		1 x		64	X

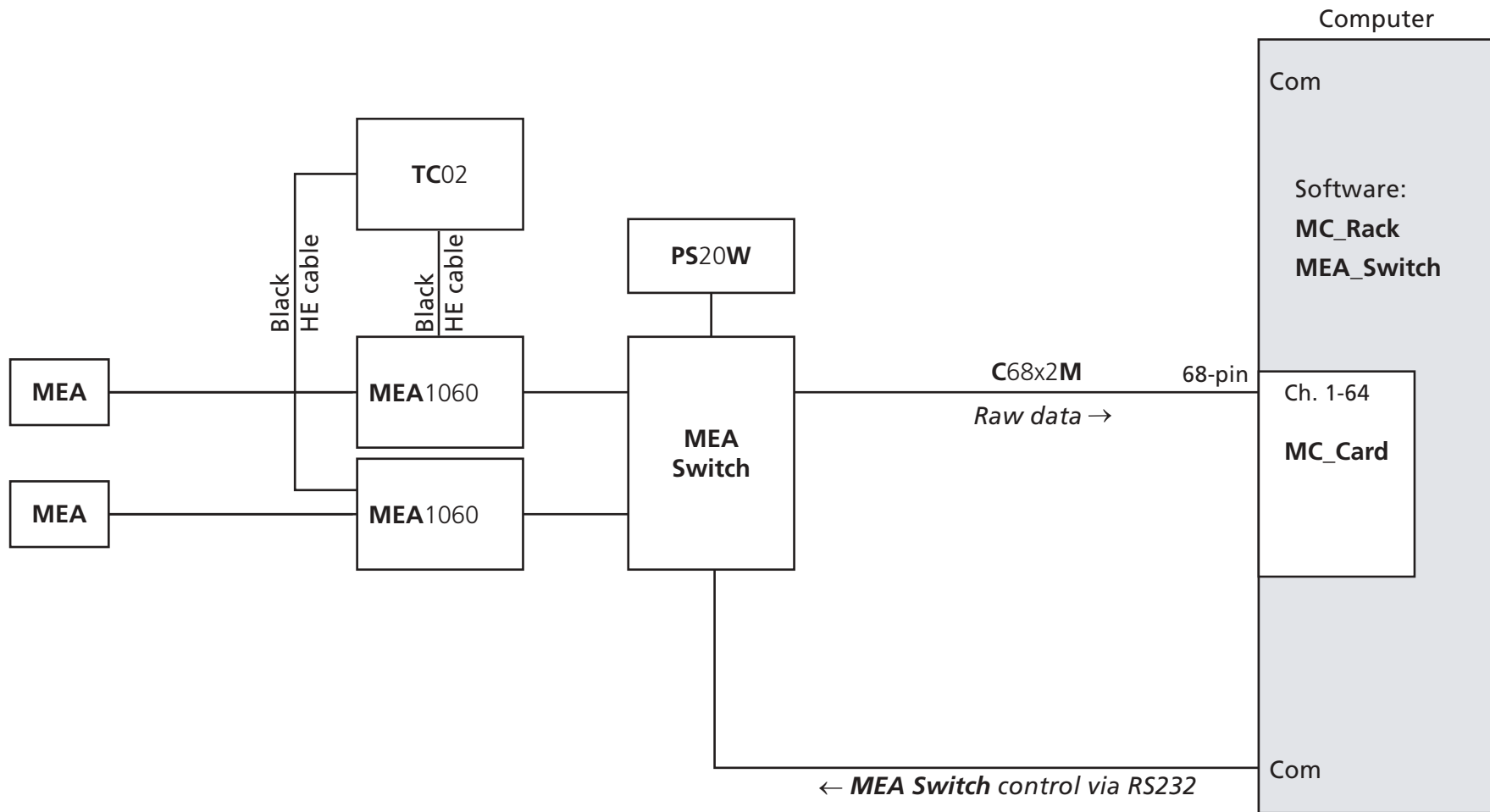
**MEA60-System-E**

64 Channel data acquisition system with **MEA1060** amplifier, temperature controller **TC02**, and **PH01** perfusion cannula



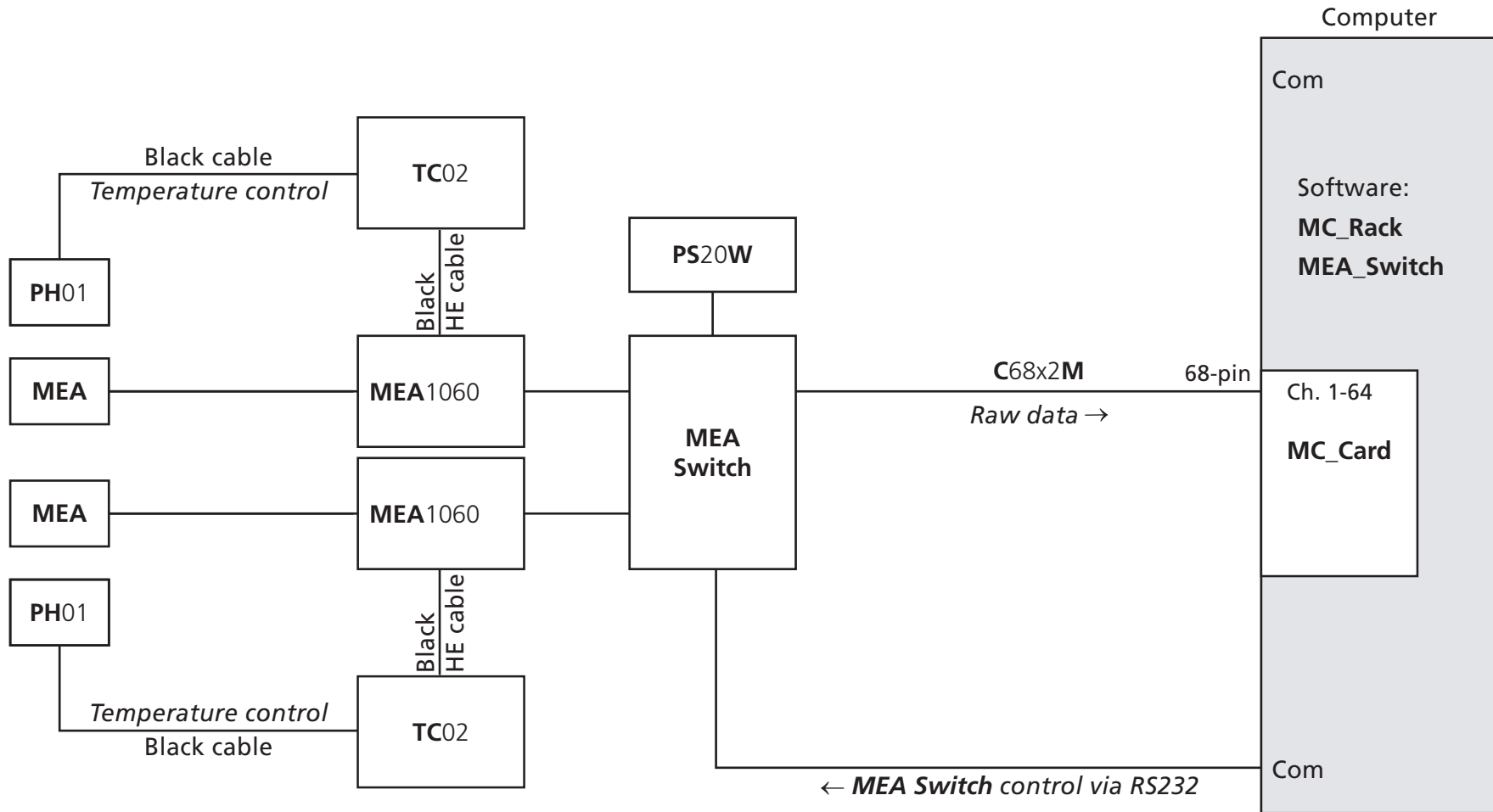
## MEA60-2-System

64 Channel data acquisition system with 2 x **MEA1060** amplifier, temperature controller **TC02**, MEA Switch **MEAS2/1**, external power supply **PS20W**



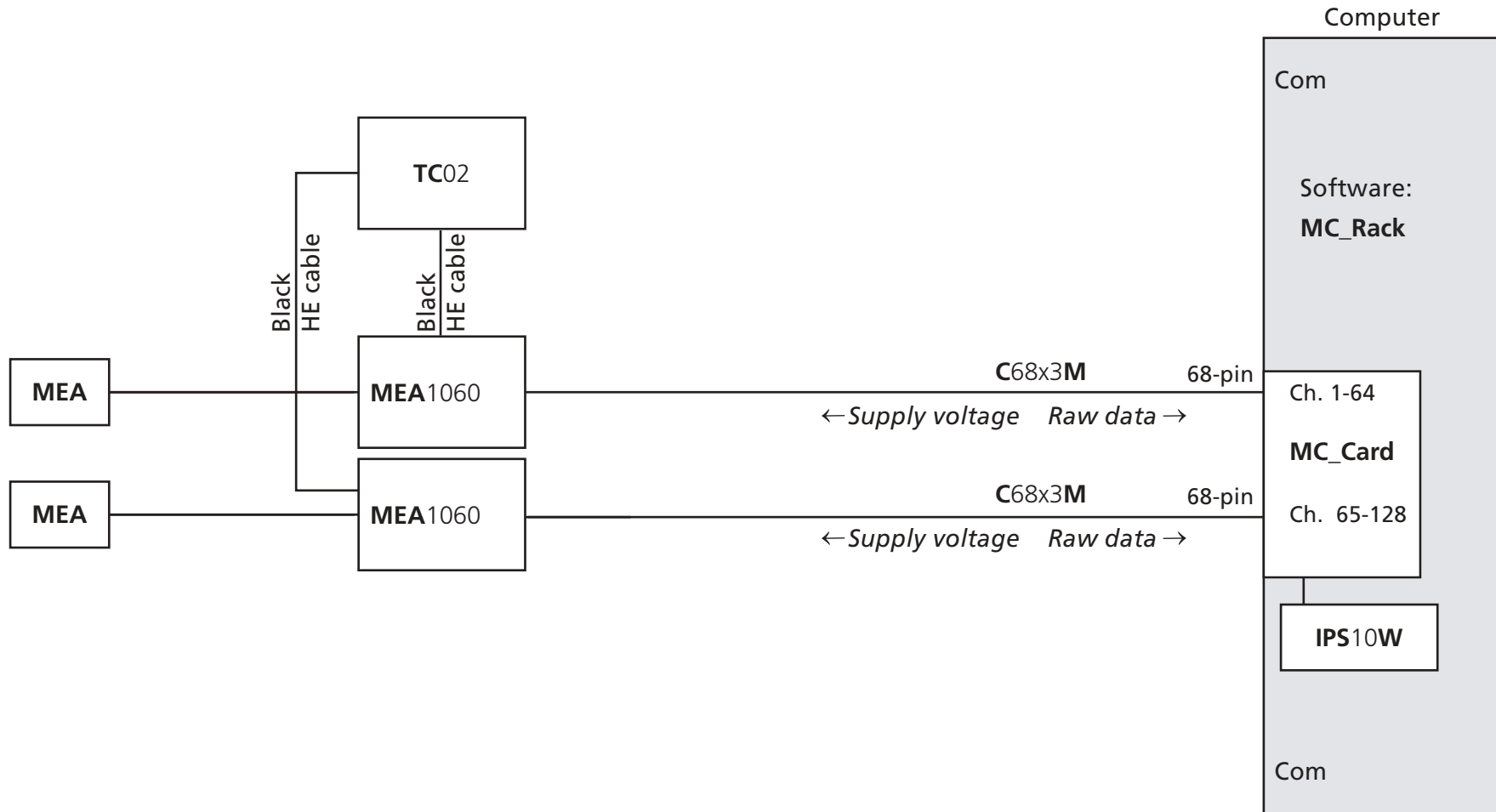
**MEA60-2-System-E**

64 Channel data acquisition system with 2 x **MEA1060** amplifier, 2 x temperature controller **TC02**, 2 x **PH01** perfusion cannula, MEA Switch **MEAS2/1**, external power supply **PS20W**



## MEA120-2-System

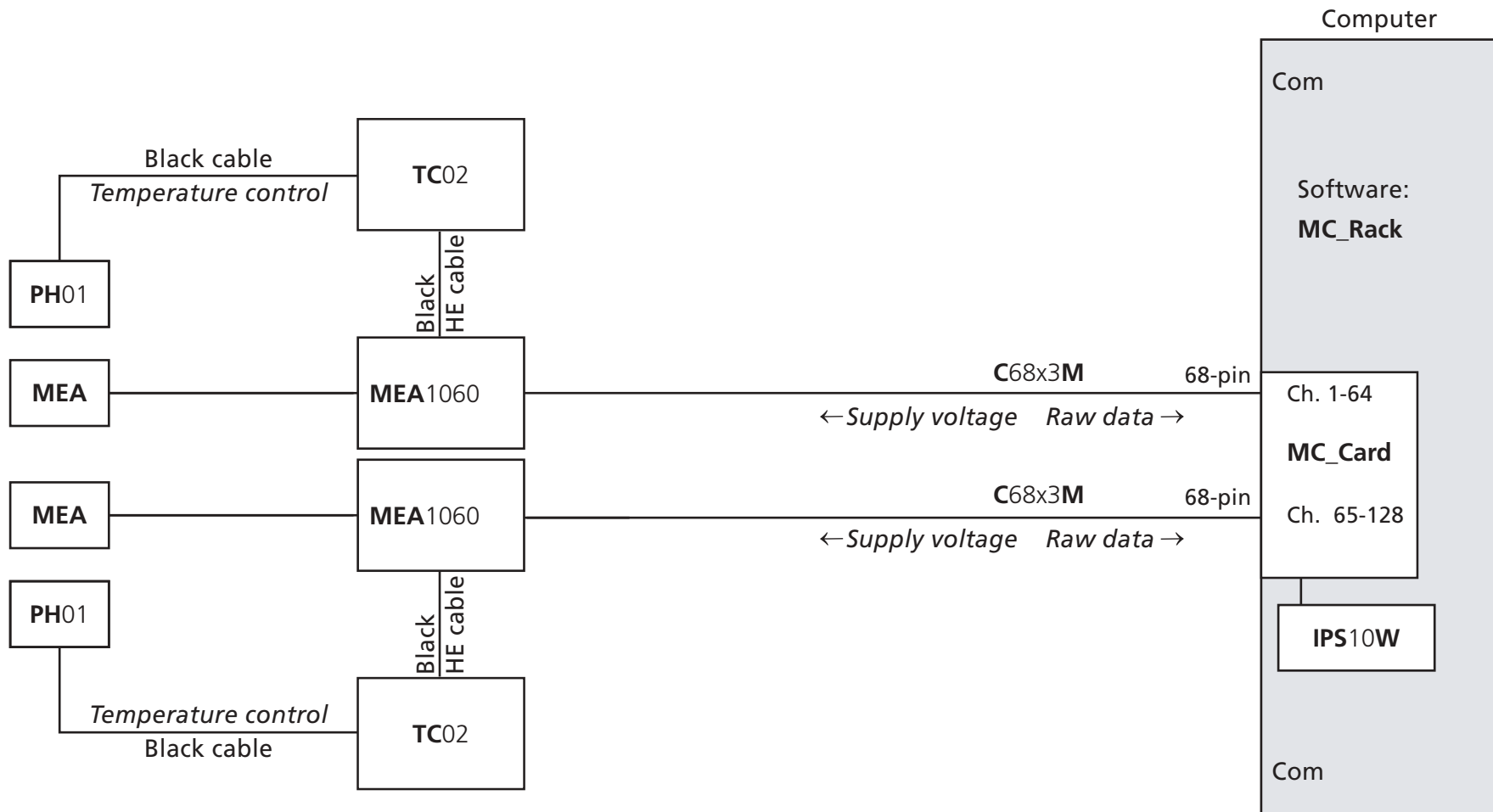
128 Channel data acquisition system with 2 x MEA1060 amplifier, and temperature controller TC02





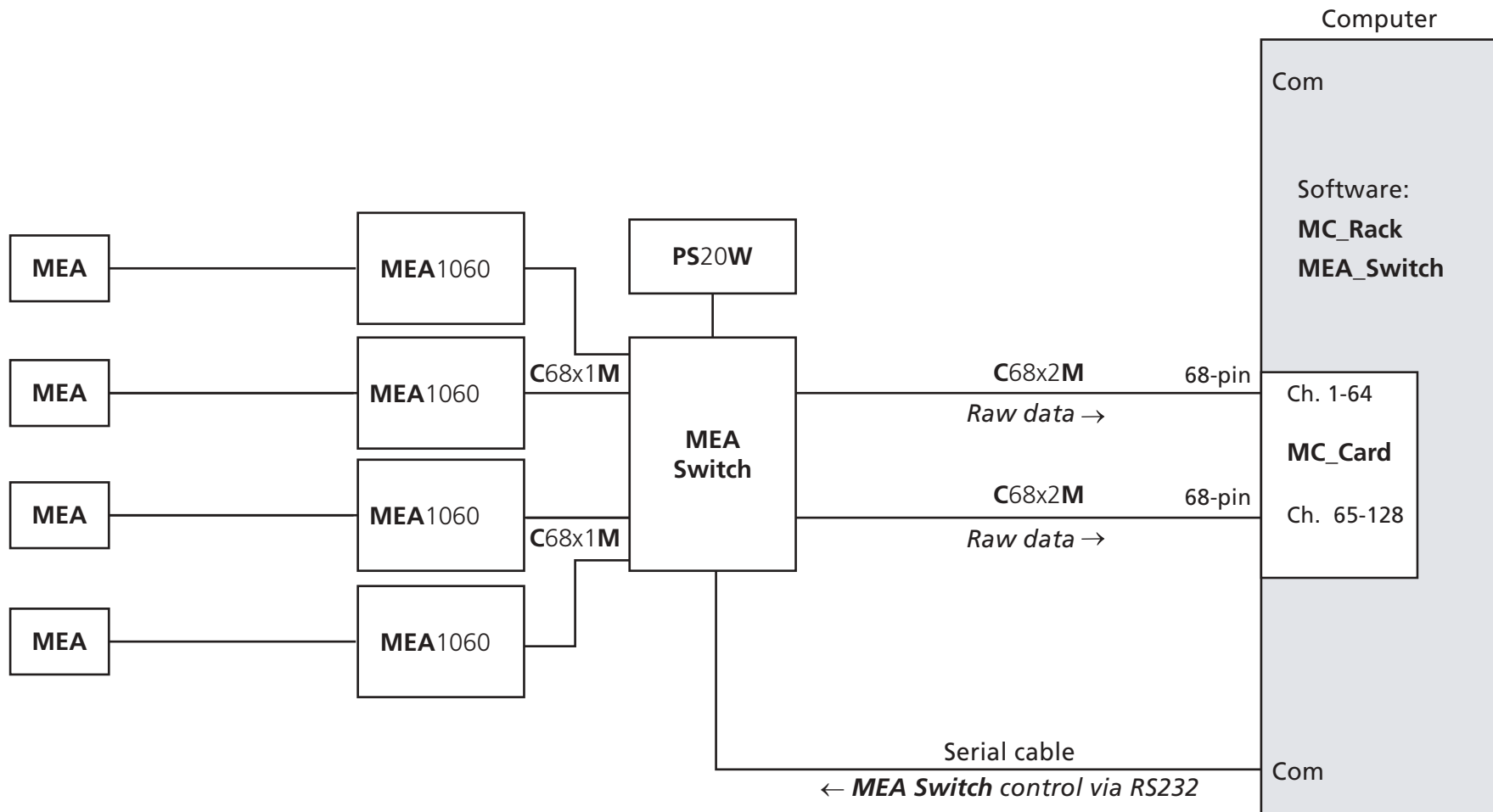
**MEA120-2-System-E**

128 Channel data acquisition system with 2 x **MEA1060** amplifier, 2 x temperature controller **TC02**, 2 x **PH01** perfusion cannula



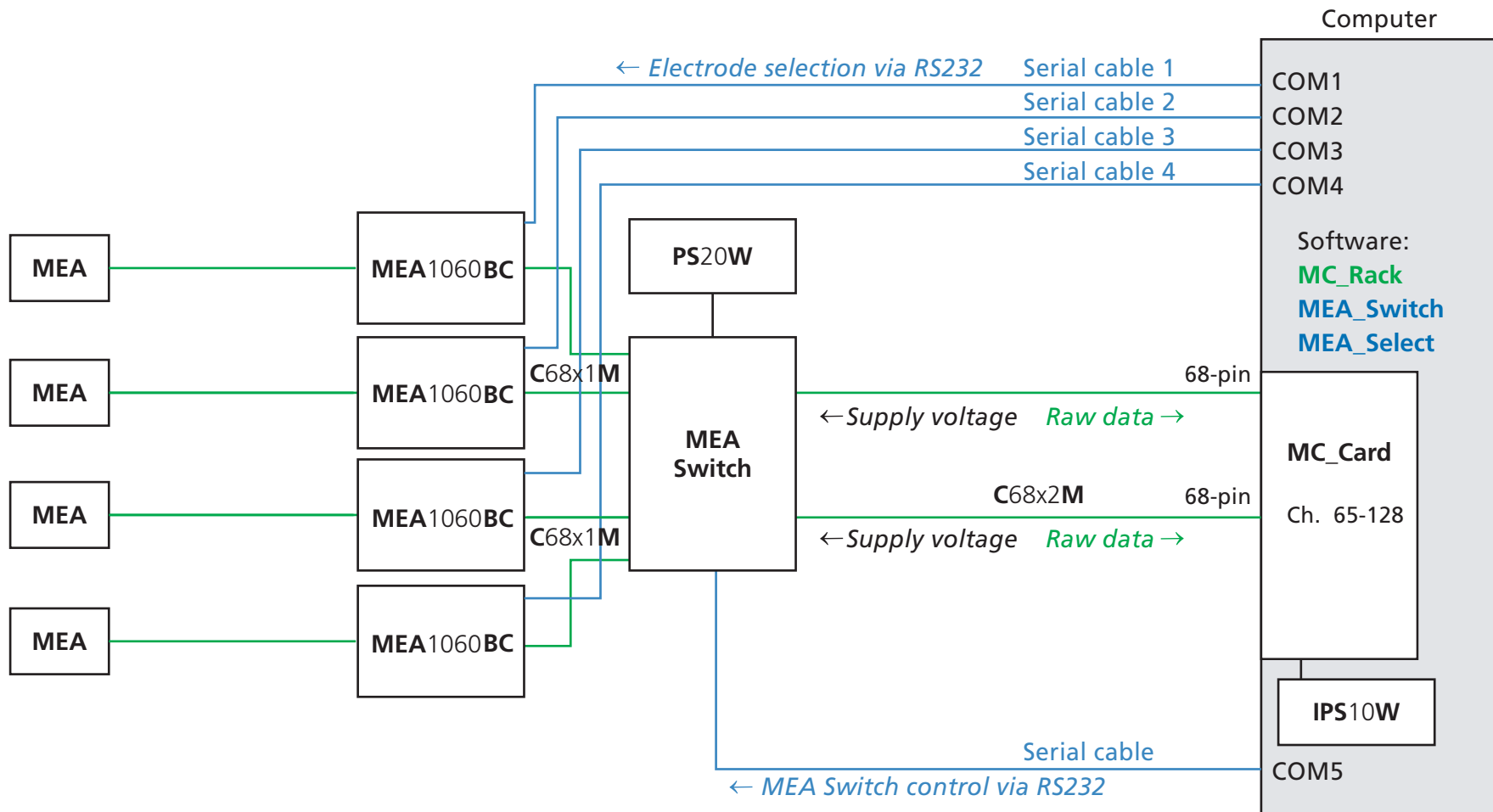
## MEA120-4-System

120 Channel data acquisition system with 4 x **MEA1060** amplifier, 2 x temperature controller **TC02** (not shown), MEA Switch **MEAS4/2**, external power supply **PS20W**



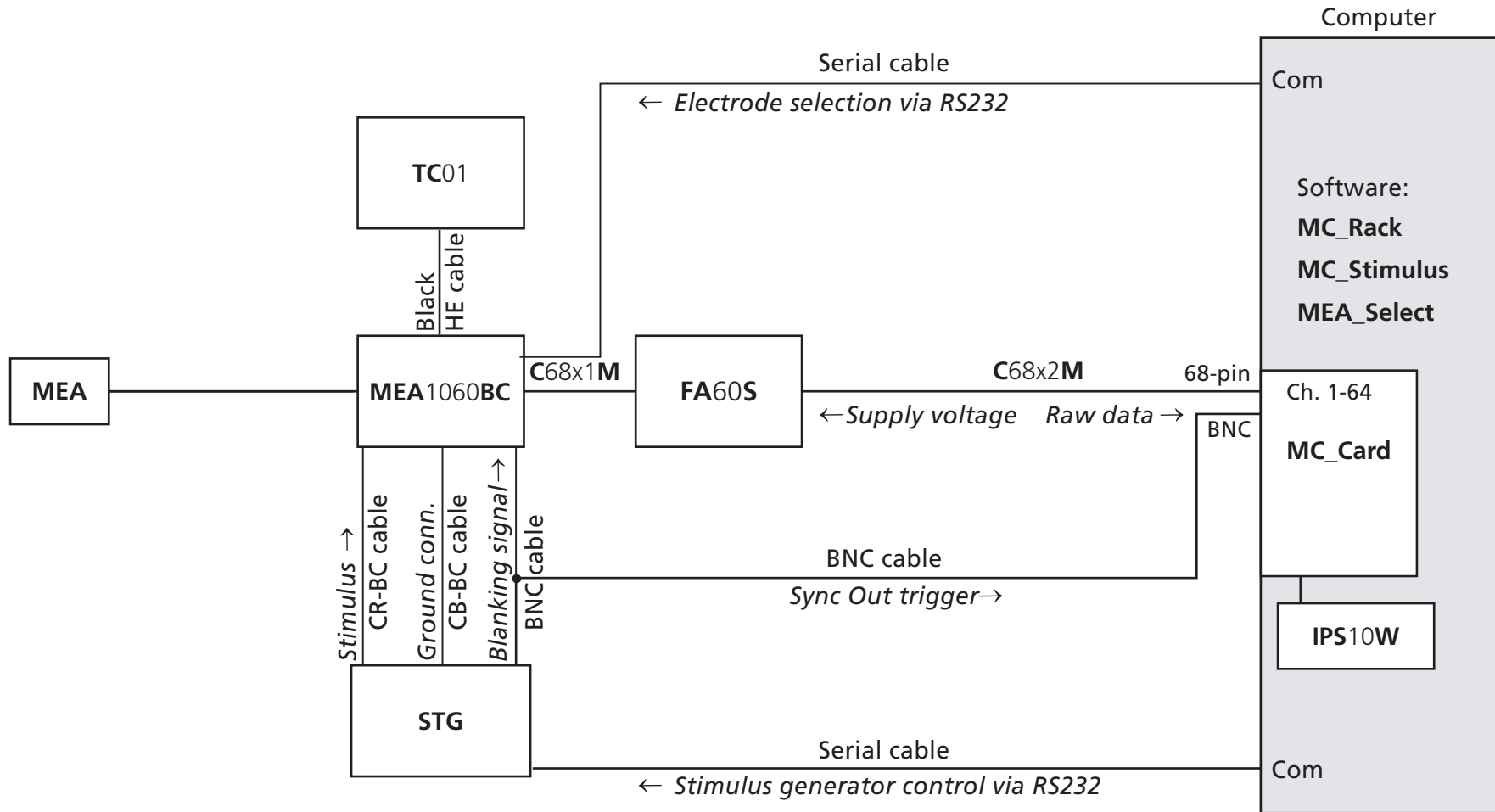
## MEA120-4-BC-System

120 Channel data acquisition system with 4 x **MEA1060BC** amplifier, 2 x temperature controller **TC02** (not shown), MEA Switch **MEAS4/2**, external power supply **PS20W**. Connection to stimulus generator not shown.



**MEA60-BC-System + STG**

64 Channel data acquisition system with **MEA1060-BC** amplifier with blanking circuit, temperature controller **TC01**, and stimulus generator **STG**



**MEA60-BC-System-E + STG**

64 Channel data acquisition system with **MEA1060** amplifier, temperature controller **TC02**, **PH01** perfusion cannula, and stimulus generator **STG**

