# 2-channel Transient Recorder

## Analog recording to 2 Ms/s with up to 16 megasample memory — 4020/54

## Features

- Selectable ten or twelve-bit resolution with excellent dynamic accuracy
- Sample rates to two megasamples per second (with one active channel at 10-bit resolution)
- Two input channels
- Differential input for common-mode rejection
- Gain of 1, 10, or 100 for each channel (strap-selectable)
- Memory expandable to sixteen megasamples (using four 4054 modules)
- Active memory size programmable down to two kilosamples
- Memory readout at full Dataway speed
- Direct readout for present-value monitoring
- Programmable pre-trigger and post-trigger intervals
- Programmable selection of internal or external clock

## General Description

The 4020 and 5054 are each single-width CAMAC modules. The 4020 is a 2-channel transient digitizer containing two 12-bit ADCs and two track-and-hold amplifiers for simultaneous sampling.

| Active Channels | Resolution | Maximum Sample Rate |
|---|---|---|
| 1 | 10-bit | 2 MHz |
| 1 | 12-bit | 1 MHz |
| 2 | 10-bit | 1 MHz |
| 2 | 12-bit | 500 KHz |

The 4054 has memory size options of one, two, or four megasamples. Up to four 4054s can be connected to one transient recorder, giving a total memory capacity of sixteen megasamples. When more than one 4054 memory module is used, each must have four megasample capacity. The available memory per channel is the total memory divided by the number of active channels. The active memory is programmably selectable in power-of-2 increments from two kilosamples to the maximum available memory. The ratio of active memory used for pretrigger is programmable from 0/8 to 8/8 in 1/8 increments.

The input signal for each channel is received on a two-contact LEMO connector. The sample rate is controlled by a programmable clock, selectable from 50 hertz to 2 megahertz, or by an external TTL-level clock connected to a front-panel LEMO connector. A clock-out LEMO connector is provided.

Pre-trigger and post-trigger sample sizes are programmable. The Stop (event trigger) LEMO accepts a TTL-level signal. When an event trigger pulse is received, the recorder continues sampling until the end of the post-trigger period is reached. A LAM can be set at that time.

The amount of active memory (which is the size of the recording "loop") is programmable down to two kilosamples. Samples for each channel can be read out contiguously by an F(2)·A(0) command preceded by an F(17)·A(0) channel select command. The readout can also occur in a streaming fashion (channel data interleaved) by using the F(2)·A(1) command. Both single-channel and streaming readout can be at full Dataway speed.

As an aid in system setup, Read commands for present-value monitoring are included. Each 4020 contains a two-word memory, readable from the Dataway with F(1)·A(0) or F(1)·A(1). This feature is usable in both the sample and nonsample states. The data is controlled by the internal or external clock. This feature can also be used without the 4054 module.