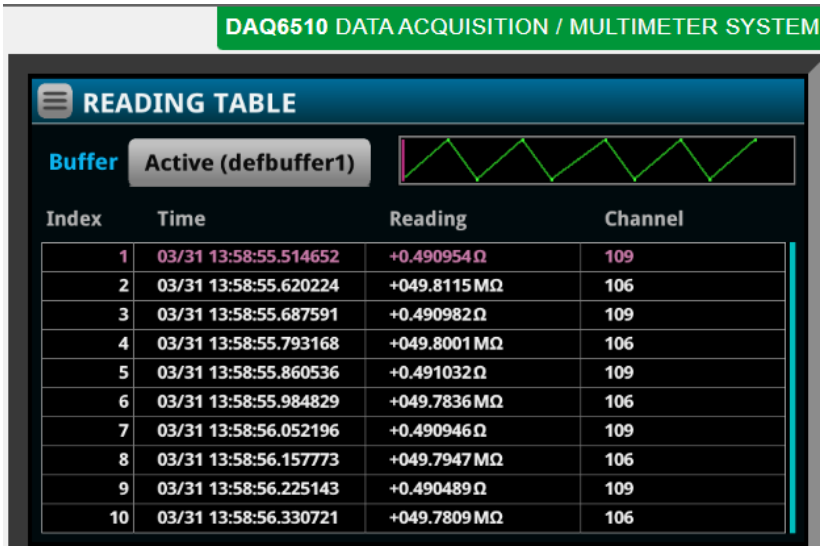
DAQ6510 – High Ohms Scan Rate/Settling Time

Channel 109 = 0.5Ω and Channel 106 = 50MΩ

Successful scan using mixed measure functions of 2W and 4W Ohms

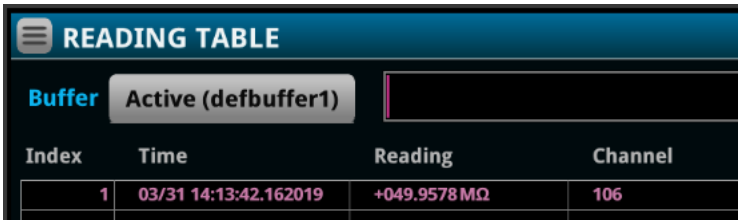


Index	Time	Reading	Channel
1	03/31 13:58:55.514652	+0.490954Ω	109
2	03/31 13:58:55.620224	+049.8115MΩ	106
3	03/31 13:58:55.687591	+0.490982Ω	109
4	03/31 13:58:55.793168	+049.8001MΩ	106
5	03/31 13:58:55.860536	+0.491032Ω	109
6	03/31 13:58:55.984829	+049.7836MΩ	106
7	03/31 13:58:56.052196	+0.490946Ω	109
8	03/31 13:58:56.157773	+049.7947MΩ	106
9	03/31 13:58:56.225143	+0.490489Ω	109
10	03/31 13:58:56.330721	+049.7809MΩ	106

IVI Driver Code for a Scan:

```
'use 4W for 0.5Ohm.
DAQ6510.ChannelFunction("109") = KeithleyDMM6500FunctionEnum.KeithleyDMM6500Function4WireResistance

'if use two wire for this known to be high ohms channel
DAQ6510.ChannelFunction("106") = KeithleyDMM6500FunctionEnum.KeithleyDMM6500Function2WireResistance

'Set up Scan
Dim scan As IKeithleyDMM6500RouteScan = DAQ6510.Route.Scan
scan.Create("109,106")

'Set the scan count
scan.Count = 5
'Set the time between scans
scan.Interval = 0.1
'Enable scan retart after power failure
scan.Restart = True

'Clear buffer
DAQ6510.Buffer.Clear("defbuffer1")

'Trigger to start the scan...
DAQ6510.Trigger.Initiate()

'Wait for scan completion
DAQ6510.Trigger.Wait()

System.Threading.Thread.Sleep(5000)
Try
    'Query the readings from the instrument
    Dim NumBufferReadings As Integer = scan.Count * 2  ' count * number of channels in scan
    Debug.Print(DAQ6510.Buffer.FetchData(1, NumBufferReadings, "defbuffer1", "READ, CHAN"))
Catch ex As Exception
    Debug.Print("Whoops'")
End Try
```

For a Single Reading from a channel, the use of 4W Ohms on the 50MΩ DUT requires more settling time.



Two aspects to address it:

Set a high measure range and re-enable auto range so that the measurement starts on high range.

Send a SCPI command to apply extra channel delay, 250msec: ":ROUT:DEL 0.25, (@106)"

```
Dim bufferName As String = "defbuffer1"
Dim buffElements As String = "READ"

'chan106 = 50M-Ohm,  chan 109 = 0.5 ohm
Dim chanStr As String = "106"

DAQ6510.Measurement.Configuration.NPLC(KeithleyDMM6500FunctionEnum.KeithleyDMM6500Function4WireResistance) = 1

DAQ6510.Measurement.Configuration.LineSync(KeithleyDMM6500FunctionEnum.KeithleyDMM6500Function4WireResistance) = True

DAQ6510.Measurement.Configuration.AutoZeroEnabled(KeithleyDMM6500FunctionEnum.KeithleyDMM6500Function4WireResistance) = True


'hint by setting starting range to use
DAQ6510.Measurement.Configuration.Range(KeithleyDMM6500FunctionsWithRangeEnum.KeithleyDMM6500FunctionsWithRange4WireResistance) = 100000000.0

'restore auto range, so it can change range if needed
DAQ6510.Measurement.Configuration.AutoRange(KeithleyDMM6500FunctionsWithRangeEnum.KeithleyDMM6500FunctionsWithRange4WireResistance) = True

DAQ6510.ChannelFunction(chanStr) = KeithleyDMM6500FunctionEnum.KeithleyDMM6500Function4WireResistance

' set extra delay for this channel
DAQ6510.System.WriteString(":ROUT:DEL 0.25, (@106)")

DAQ6510.Route.ChannelConfiguration.Close(chanStr)

DAQ6510.System.WriteString(":DISP:WATC:CHAN (@" + chanStr + ")")   'set desired watch channel

lblResult.Text = DAQ6510.Measurement.Measure(KeithleyDMM6500FunctionEnum.KeithleyDMM6500Function4WireResistance,
                            bufferName,
                            buffElements)
```