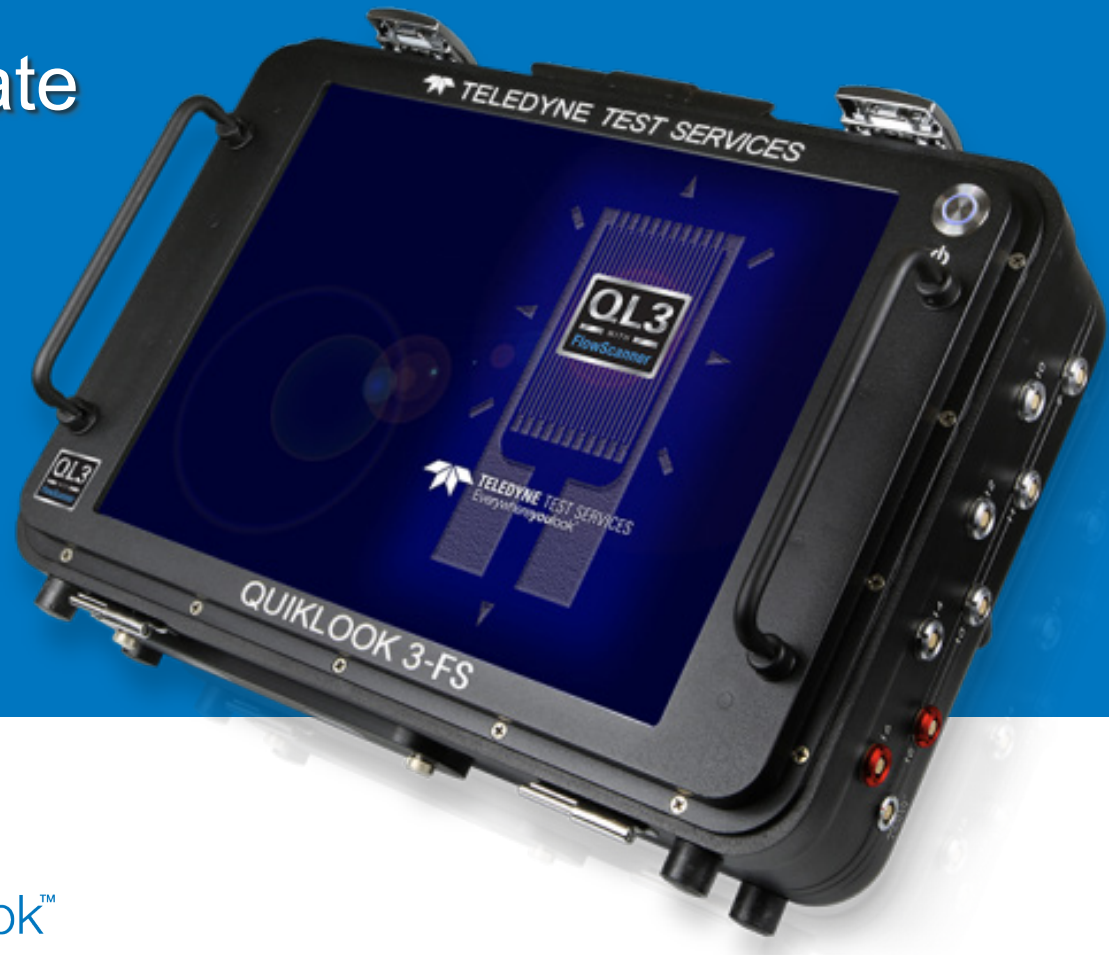


QL3-FS Features & Update

Presented by:

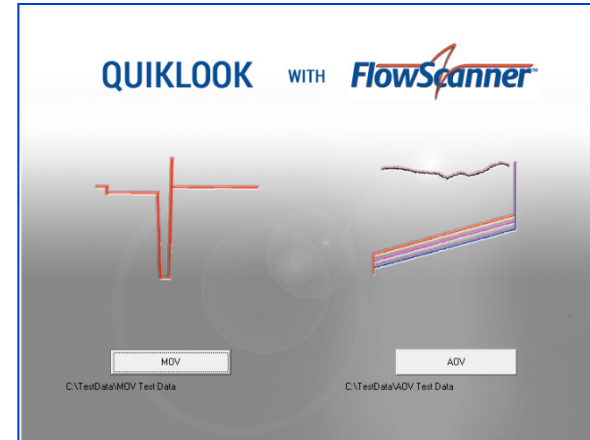
R. Michael Sullivan

Eric A. Solla

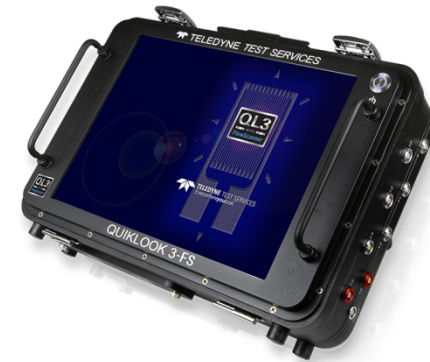


TELEDYNE
TEST SERVICES
Everywhere you look™

- ✓ Merging Flowscanner and QUIKLOOK Software



- ✓ Jointly offered Test Platform – **QL3-FS**



World Class Hardware

- + Right Information
- + In the Right Place
- + At the Right Time

= ALARA + Savings



QL3-FS Guiding Principles



The screenshot displays the QUIKLOOK AOV software interface for a valve test. On the left, a vertical list of sensors is shown with their current readings and units:

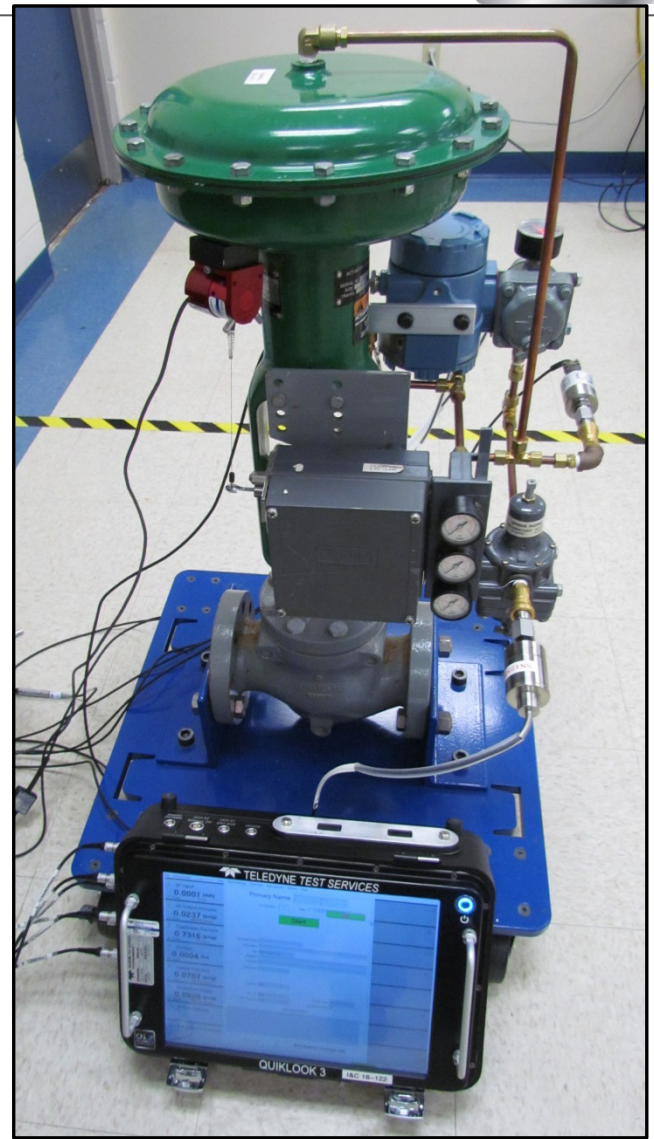
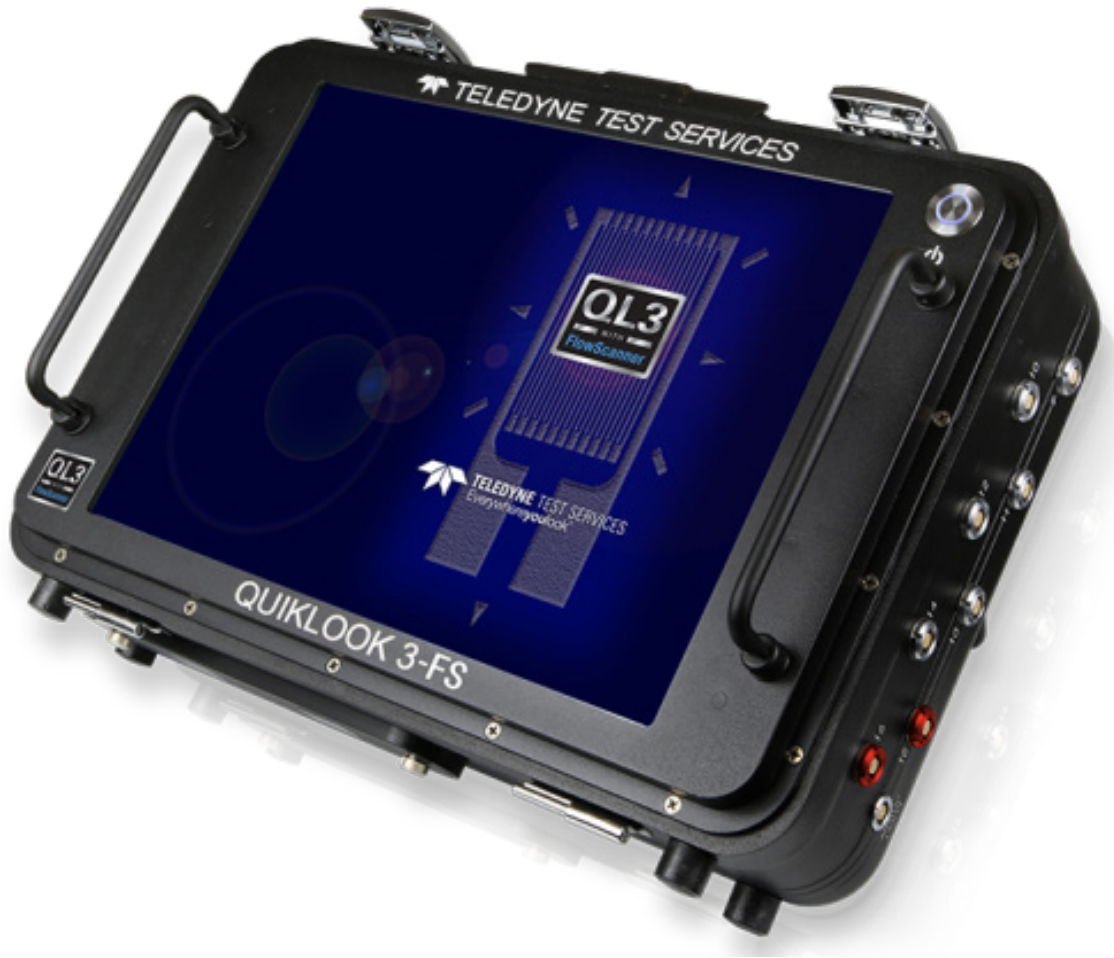
- 1 I/P Input
- 2 I/P Output Pressure: 10.62 (psig) (30 PSI)
- 3 Diaphragm Pressure: 4.364 (psig) (100 PSI)
- 4 Position: 1.147 (In) (SPMD)
- 5 Thrust: 42.65 (Lbs) (QSS Thrust)
- 6 Regulated Supply: 24.09 (psig) (30 PSI)

The main control panel on the right includes:

- Primary Name: TEST VALVE
- Test Number: 1
- Date: 2/18/2014 10:18:46 AM
- A prominent green **Start** button.
- Secondary Name, Description, Title (Slow Ramp Test), Comment, and Technician fields.
- Direction: N/A
- AF / AL: N/A
- Max Seconds: 15
- Display Time: 50
- Acquisition Rate: 10
- Additional Comments: Normal Stroke, Reverse actuating positioner, Direct actuating Valve. String Pot mounted to bottom plate.
- Buttons for Show Control and Excitation Voltage OK.

The bottom status bar shows "No failures", the date "2/18/2014", and the time "10:24 AM".

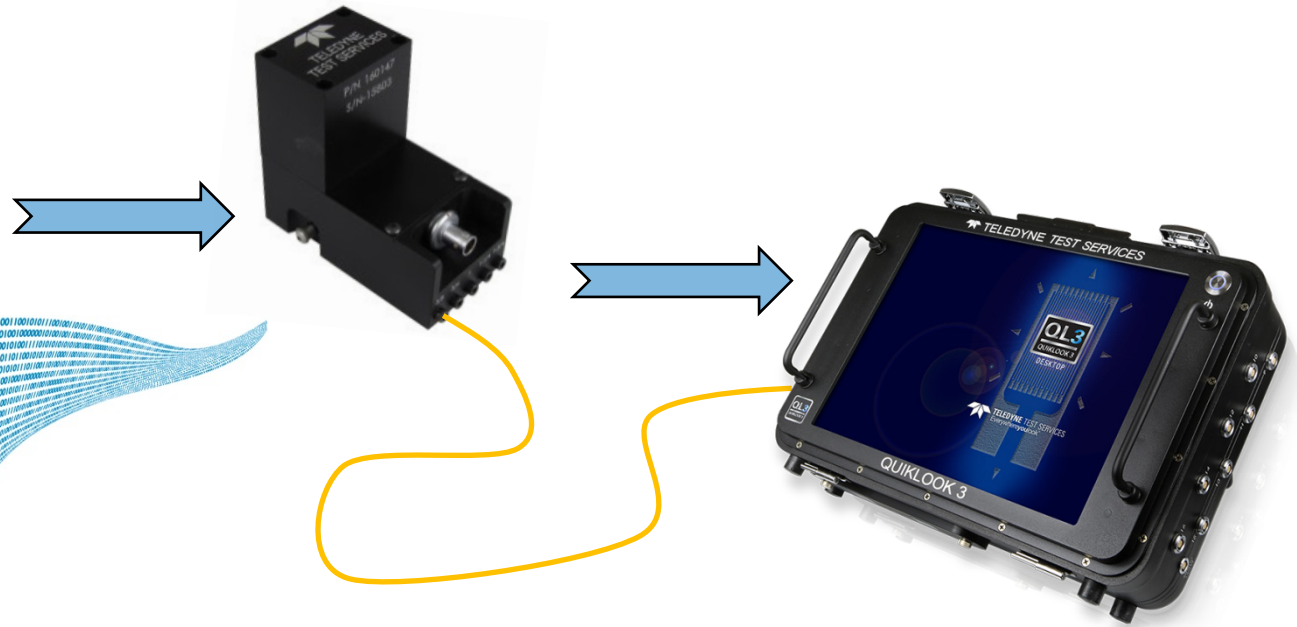
QL3-FS Valve Diagnostic Test System



Plug and Play Sensor Recognition

- Open Source Industry Standard (TEDS) - IEEE P1451.4/2.0
- TEDS (Transducer Electronic Data Sheet)
- All calibration and setup data is electronically stored on the sensor
- Transferred to QUIKLOOK when the sensor is plugged in

CERTIFICATE OF CALIBRATION				
Client: Dominion North Area	Date: 12/12/13			
Purchase Order No: 12112341, Sub: 071013	OTS Project No: 130801			
QUIKLOOK HARDWARE				
Computer ID: 2054	Manufacturer: Teledyne	Model: 380228	S/N: 11981	
ACQUISITION CARDS				
Manufacturer: Kistler	Model No: KFC-3107	Serial No: 0112481		
Manufacturer: Kistler	Model No: KFC-3107	Serial No: 0112484		
ANALOG OUTPUT CARD				
Manufacturer: Kistler	Model No: KUS-3100	Serial No: KUS-11801		
CALIBRATION SOFTWARE				
Name: CalQR	Rev: 2012.008	Build: 1.1.00		
EXCITATION VOLTAGE				
Board: 4.907	Volt: Board 2: 4.907	Units:		
CALIBRATION STANDARDS				
Manufacturer:	Model No:	Serial No:	Calibration Date:	Calibration Due:
Pulse	1500A	4830	1402/2013	11/22/2015
Pulse	1400A	581100	1302/2013	11/22/2013
Comment: As Found / As Left Calibration				
Specification: Voltage Load = 1% Reading Current Output = 1% Reading Voltage Output = 2% Reading				
CERTIFIED BY: QA Engineer: [Signature] Date: 12/12/13				
TELEDYNE TEST SERVICES A Teledyne Technologies Company				
171 Mill Road, Weston, Massachusetts 02793-1000, Telephone: 508-748-0100, Fax: 508-748-0020				
Page 1 of 22				
P.O. 170807-AP, AL, CA, OH, MI, CA				
88974MPC04 4/26/14				
13080101 11-21-13 AM				



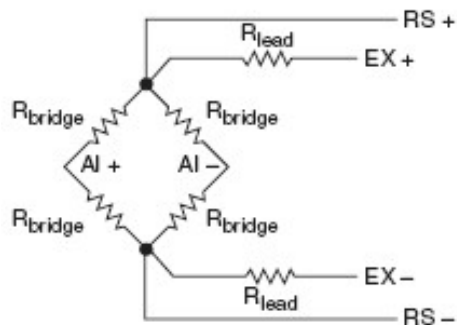
Battery Operation

- Hot swappable batteries
- Up to 5 hours operating on a charge
- In system charging



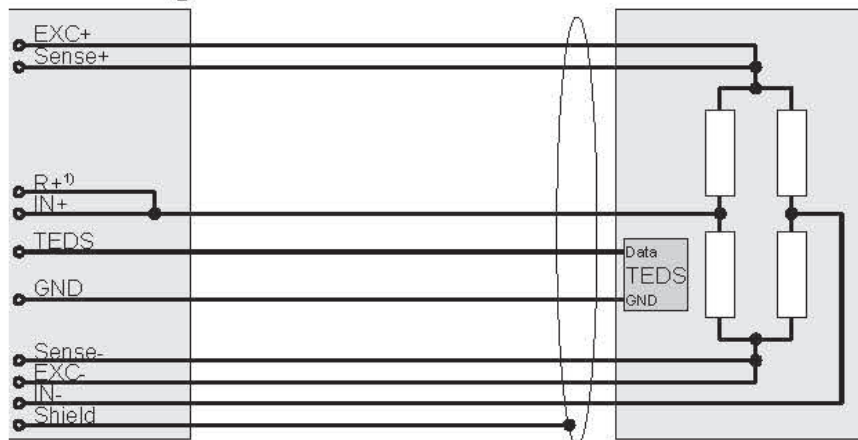
Voltage Sense

- Eliminate the need for a Voltage Drop Box



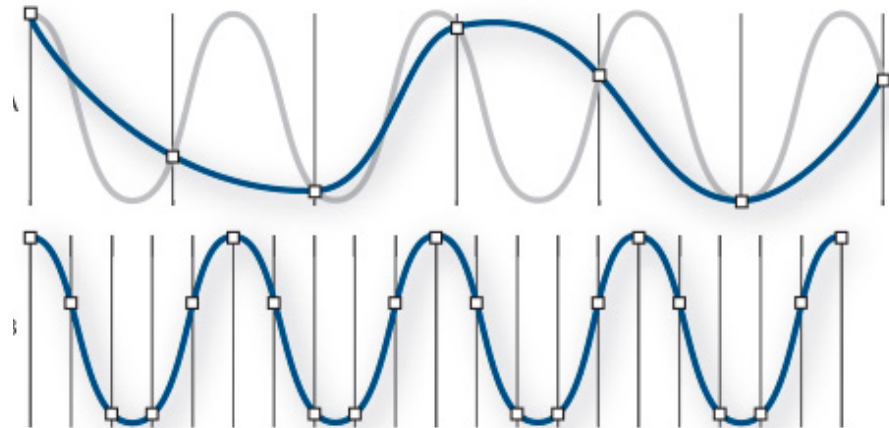
Signal connection

Full bridge 6 wire sensor connection



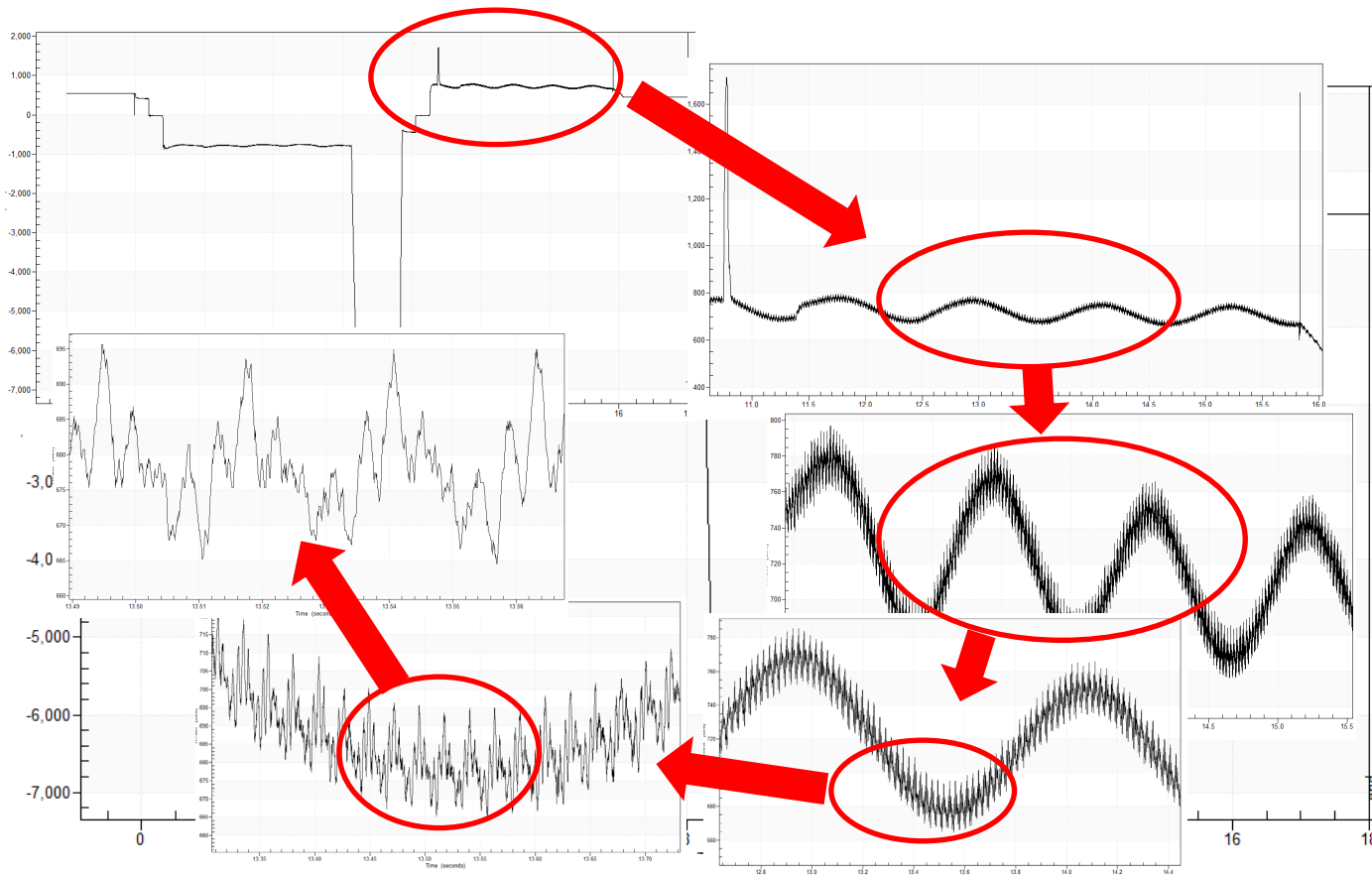
Increased Maximum Acquisition Rate (up to 200,000 s/s)

- Sample Rate 10 to 50,000 s/s, 16CH's simultaneously acquired
- Hardware capable of 200,000 s/s
- Check Valve Testing Requires (10k-50k s/s)

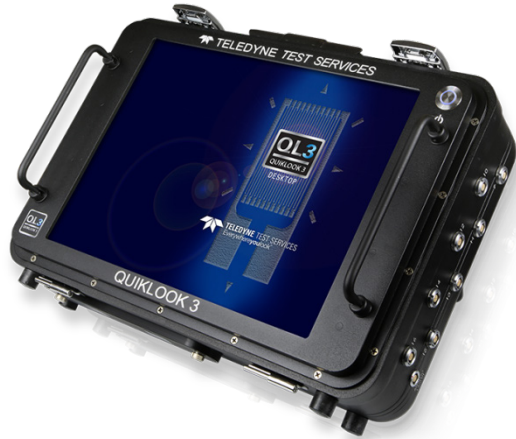


High End Data Acquisition Technology

- 16 Individual Op Amp with independent Excitation Sources
- Signal to noise ratio reduction – Trace Quality



Encoder option to add 2 digital channels



QL3-FS
part no. 160600

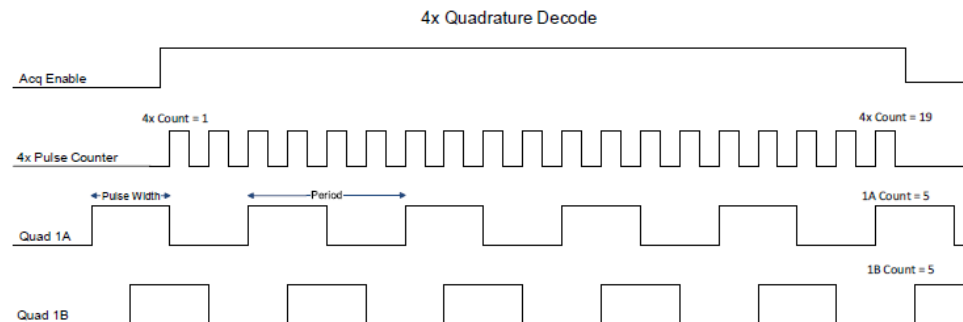
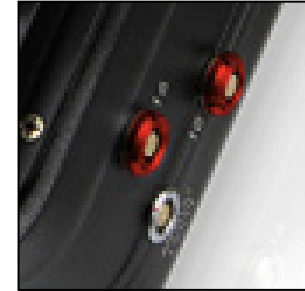


QL3-FS
part no. 160600E

“E” Option

Digital Inputs - Channel 15 & 16

- ✓ Quadrature
- ✓ Resolution – 32 Bit
- ✓ Max Decode Count +/- 2,147,483,648
- ✓ Max rate – 500k counts/second
- ✓ Translates into
 - > 400 inches/second
 - 1260 counts/inch

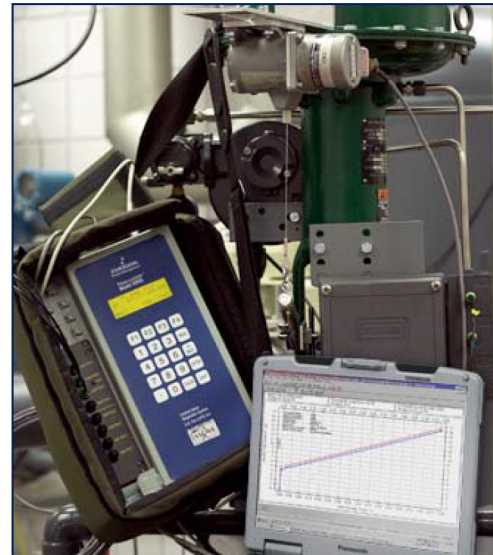


New TTS Digital Encoders

- ✓ Resolution: 1260 counts/inch (0.0008 inch)
- ✓ Accuracy: 0.12% FS (0.036 inch)
- ✓ Look for change to % reading



Conversion and Compatibility with Existing Emerson Linear & Rotary Encoders



New Cal-QL Software for “E” units

- ✓ Report and procedure modified to accommodate digital channels 15 & 16
- ✓ Separate procedure and report for digital channels – to be combined soon.

Channels 1-14

CERTIFICATE OF CALIBRATION					
Client: Duke Energy		TTS Project No: 32116		Cal Date: 7/25/2015	
PO No: 0019853		Cal Due Date: 7/25/2016			
QUIKLOOK HARDWARE					
Computer: QL3-0054	Manufacturer: Teledyne	Model: 160600E	S/N: 17172		
ACQUISITION CARDS					
Manufacturer: Teledyne	Model No: QL3	Serial No: A01500AB			
Manufacturer: Teledyne	Model No: QL3	Serial No: A01500AA			
ANALOG OUTPUT CARD					
Manufacturer: Data Translation	Model No: DTUSB-9812	Serial No: 00704927			
Manufacturer: Circuit Technology	Rev 5	0115			
SOFTWARE					
Program Name: CalQL Pro Encoder	Rev: 2015.76	Build: 1.1.10			
Quiklook: Program Name: QUIKLOOK 3	Rev: 2014.197	Build: 3.2.15			
EXCITATION VOLTAGE					
See Next Page for Excitation Results					
CALIBRATION STANDARDS					
Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due	
Fluke	5508A	46580	8/26/2014	8/26/2015	
Fluke	5522A	1811902	8/15/2014	8/15/2015	
Comment: Initial calibration					
For analog channels 1 thru 14 only. See separate Certificate of Calibration for digital channels 15 & 16.					
Specification: Voltage Input +/- 1% Reading Current Output +/- 1% Reading Voltage Output +/- 2% Reading					
CERTIFIED BY: Technician: _____		Date: 7/25/2015			
Engineer: _____		Date: _____			
 513 Mill Street, Marlon, Massachusetts 02738-1549 Telephone: 508-748-0103 Fax: 508-748-2029					

P:\32000 - All In-House Jobs\ UNIT QL3-0054 Cal
 CalQL Pro Encoder 2015.76
 MRNENPC60 agreed Page 1 of 22
 8/16/2015 1:52:12 PM

Channels 15-16

CERTIFICATE OF CALIBRATION					
Client: Duke Energy		TTS Project No: 32116		Cal Date: 7/27/2015	
PO No: 0019853		Cal Due Date: 7/27/2016			
QUIKLOOK HARDWARE					
Computer: QL3-0054	Manufacturer: Teledyne	Model: 160600E	S/N: 17172		
ACQUISITION CARD					
Manufacturer: Teledyne	Model No: QL3 Digital CH 15 & 16	Serial No: 17205			
SOFTWARE					
Program Name: QUIKLOOK 3	Rev: 2014.197	Build: 3.2.15			
CALIBRATION STANDARDS					
Manufacturer	Model No	Serial No	Calibration Date	Calibration Due	
Yabor Electronics	WW2074	207913	09/16/15	03/16/16	
Comments: Initial Calibration					
Digital Input CH 15 & 16 ONLY. See separate C of C for CH1-14 Analog Inputs					
Specification: Accuracy: +/- 2 counts					
CERTIFIED BY: Technician: _____		Date: _____			
Engineer: _____		Date: _____			
 513 Mill Street, Marlon, Massachusetts 02738-1549 Telephone: 508-748-0103 Fax: 508-748-2029					

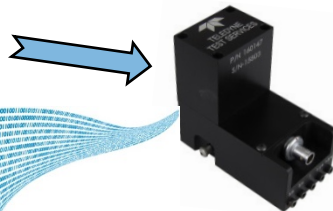
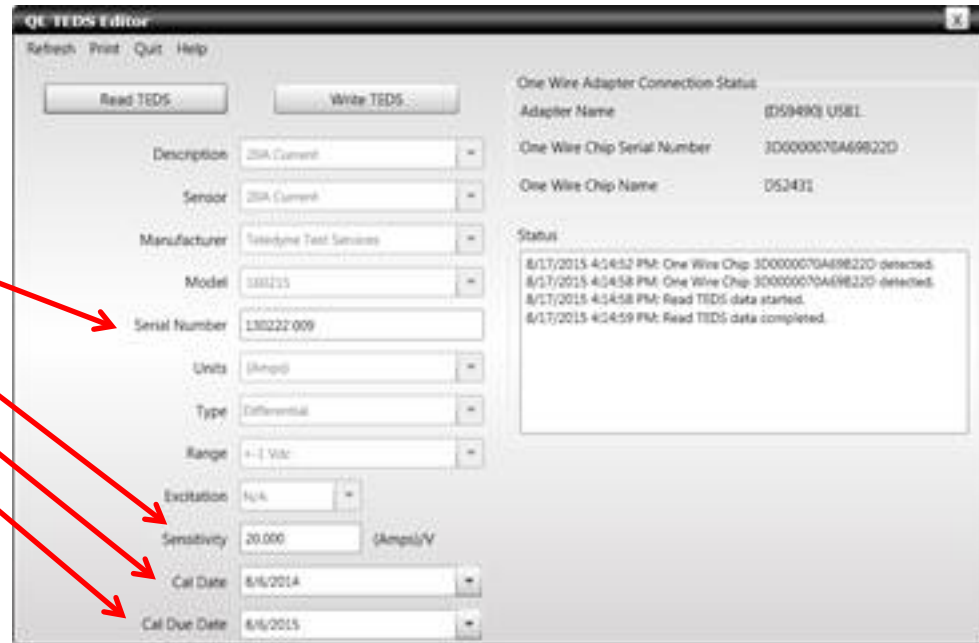
Page 1 of 3

New TEDS Writing Software

Allows customers to perform calibrations “in-house” and write pertinent data to the TEDS chips.

Fields available for customer write;

- ✓ Serial Number
- ✓ Sensitivity
- ✓ Calibration date
- ✓ Recalibration date



Any Questions?

THANK YOU



TELEDYNE
TEST SERVICES
Everywhere you look™