INTALOGIX™ TECHNOLOGY

- Fairbanks Scales approach to digital technology for scales.
- Digital signal from cells to Instument common in various forms.

INTALOGIX™ TECHNOLOGY

What is it ?

An advanced digital technology for weighing equipment, providing outstanding resolution, accuracy and performance !

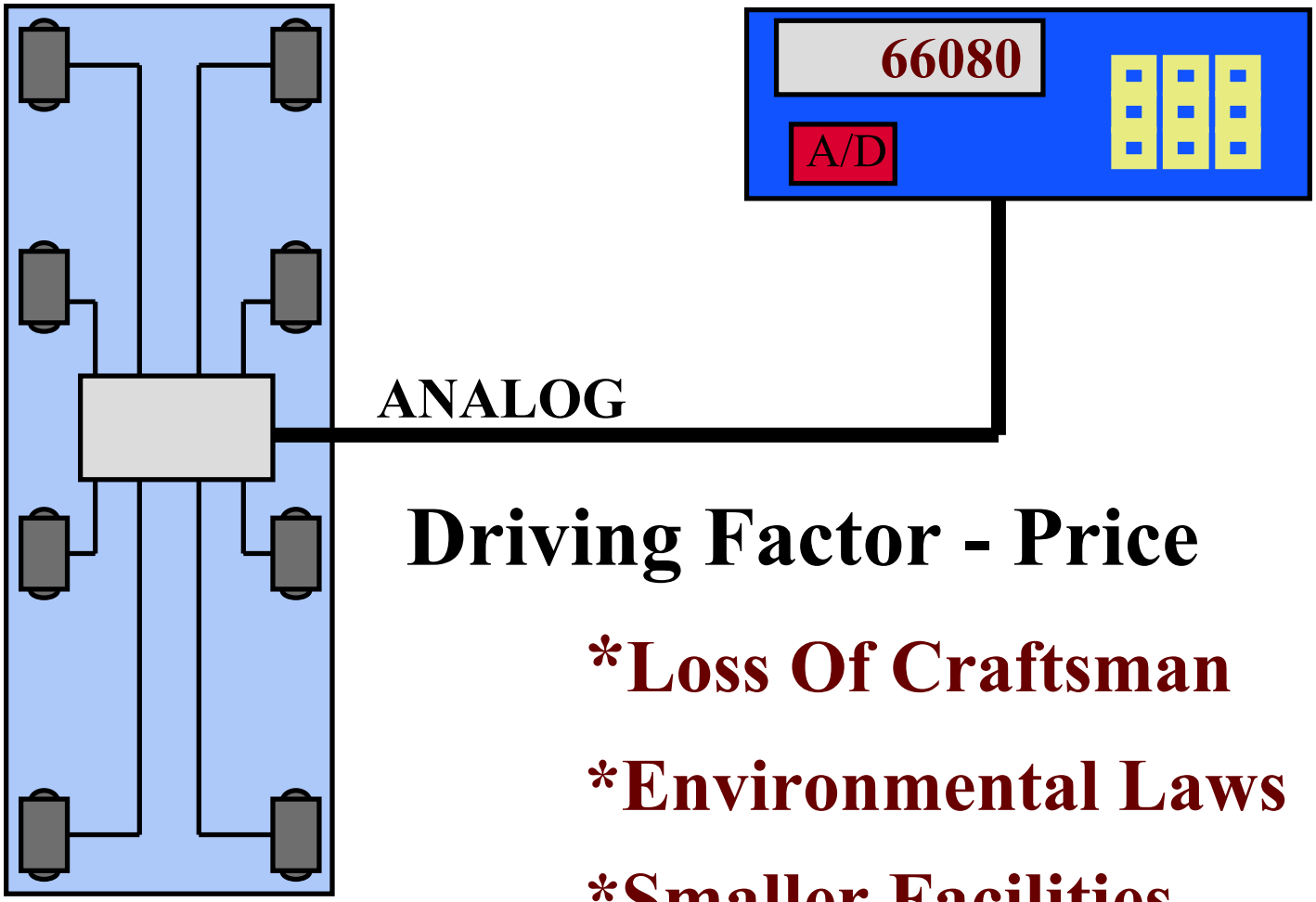
INTALOGIX™ TECHNOLOGY

Digital Technology !

1970's Digital Instruments

Cells analog, converter in instrument

1970's Digital Weighing Systems



Driving Factor - Price

*Loss Of Craftsman

*Environmental Laws

*Smaller Facilities

INTALOGIX™ TECHNOLOGY

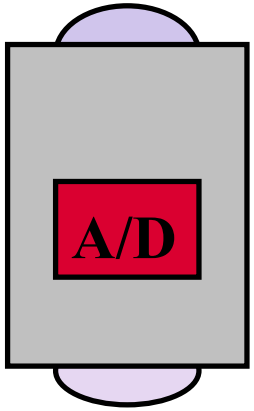
Digital Technology !

1970's Digital Instruments

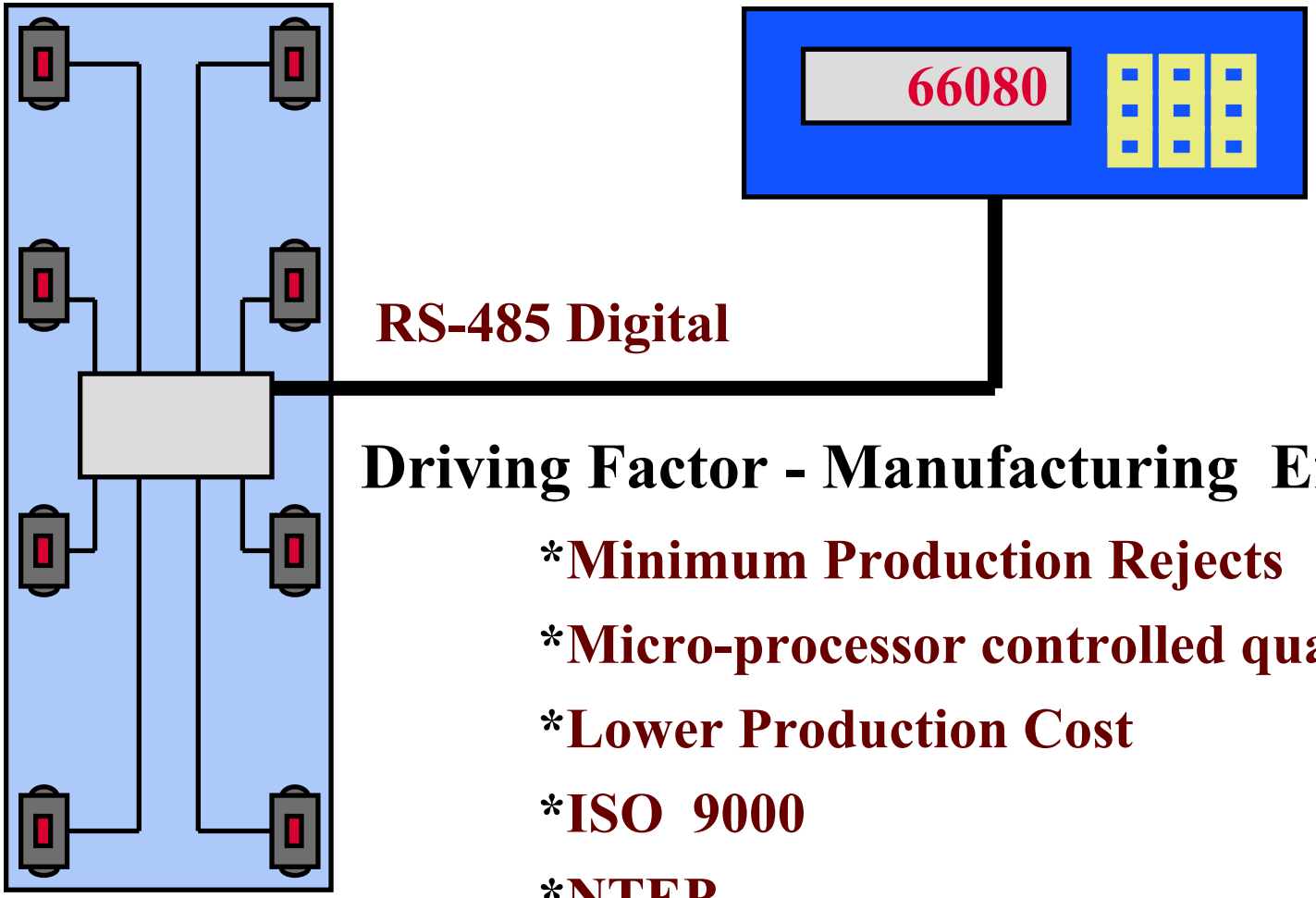
Cells analog, converter in instrument

1990 Digital output cells, converter

in cells lower manufacturing cost



Early 90's Digital Load Cell Systems



Driving Factor - Manufacturing Efficiency

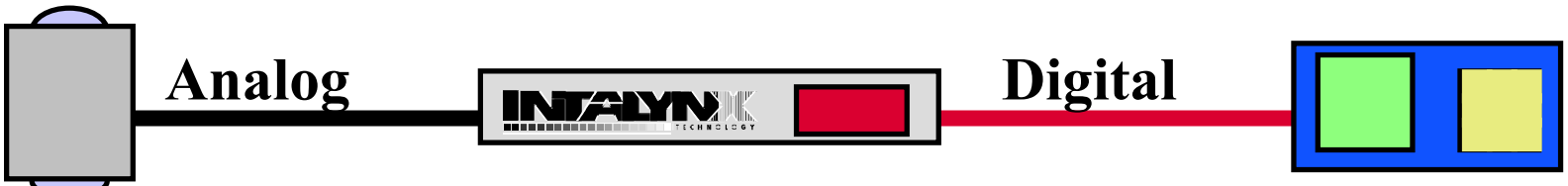
- *Minimum Production Rejects
- *Micro-processor controlled quality
- *Lower Production Cost
- *ISO 9000
- *NTEP

INTALOGIX™ TECHNOLOGY

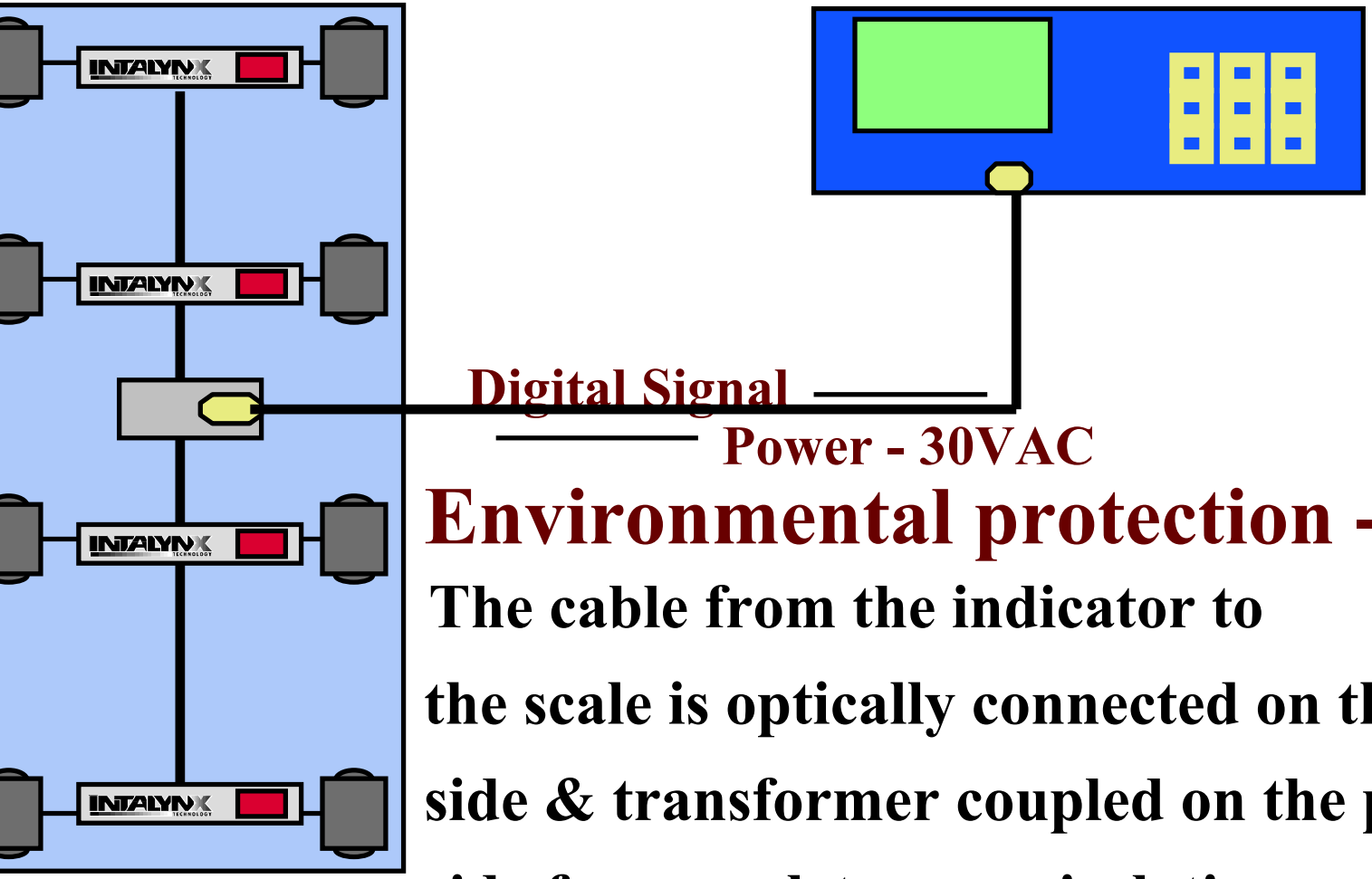
Advanced digital technology ?

1995 INTALOGIX Technology:

Converter is separate component. Analog load cells are isolated from power surges. "Instrument" is micro-processor only. The result is a high resolution, high accuracy, environmentally protected system !



INTALOGIX™ TECHNOLOGY

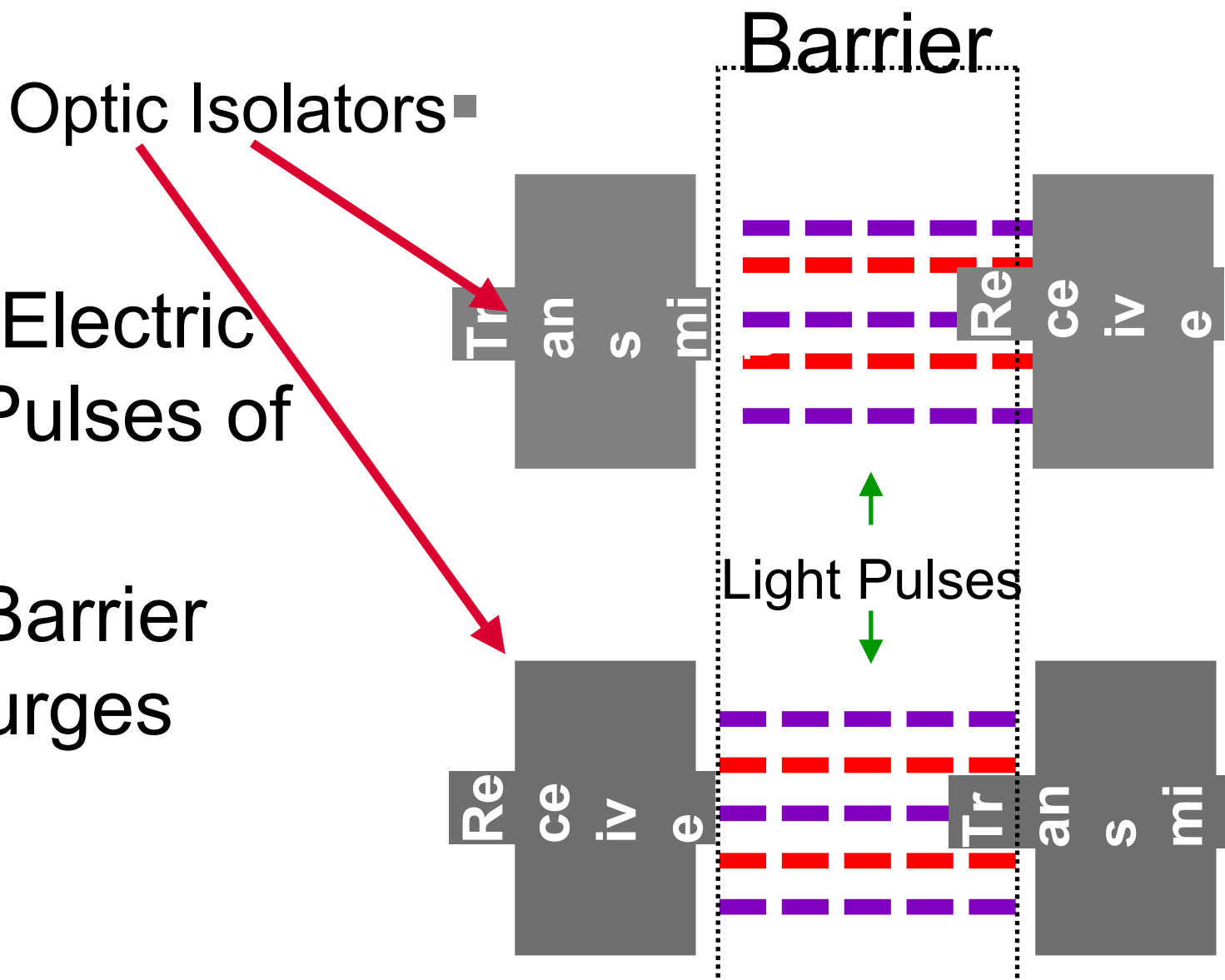


Environmental protection -

The cable from the indicator to the scale is optically connected on the signal side & transformer coupled on the power side for complete surge isolation.

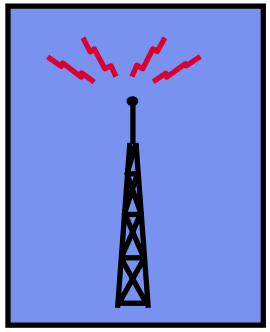
Optic Isolation

- Transfers Electric Signal to Pulses of Light
- Provides Barrier Against Surges



INTALOGIX™ TECHNOLOGY

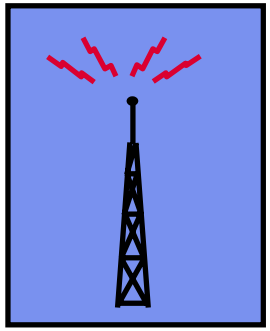
Environmental Protection Benefits



RFI Immune - Critical components in enclosures located under scale. Signal to indicator is high. Cable to & from scale is optically isolated.

INTALOGIX™ TECHNOLOGY

Environmental Protection Benefits



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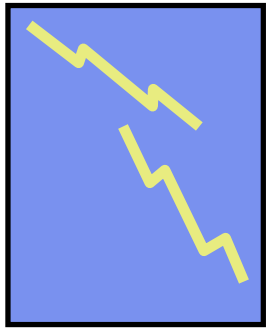
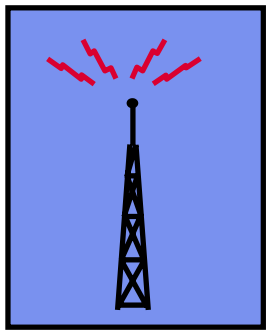


Surge Voltage Protection - The power supply and load cells are isolated providing Surge protection 8 times greater than previous technologies.

INTALOGIX™ TECHNOLOGY

Environmental Protection Benefits



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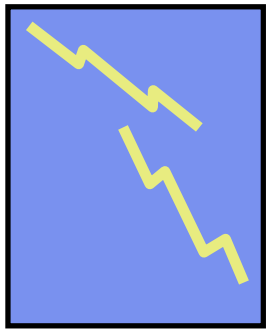
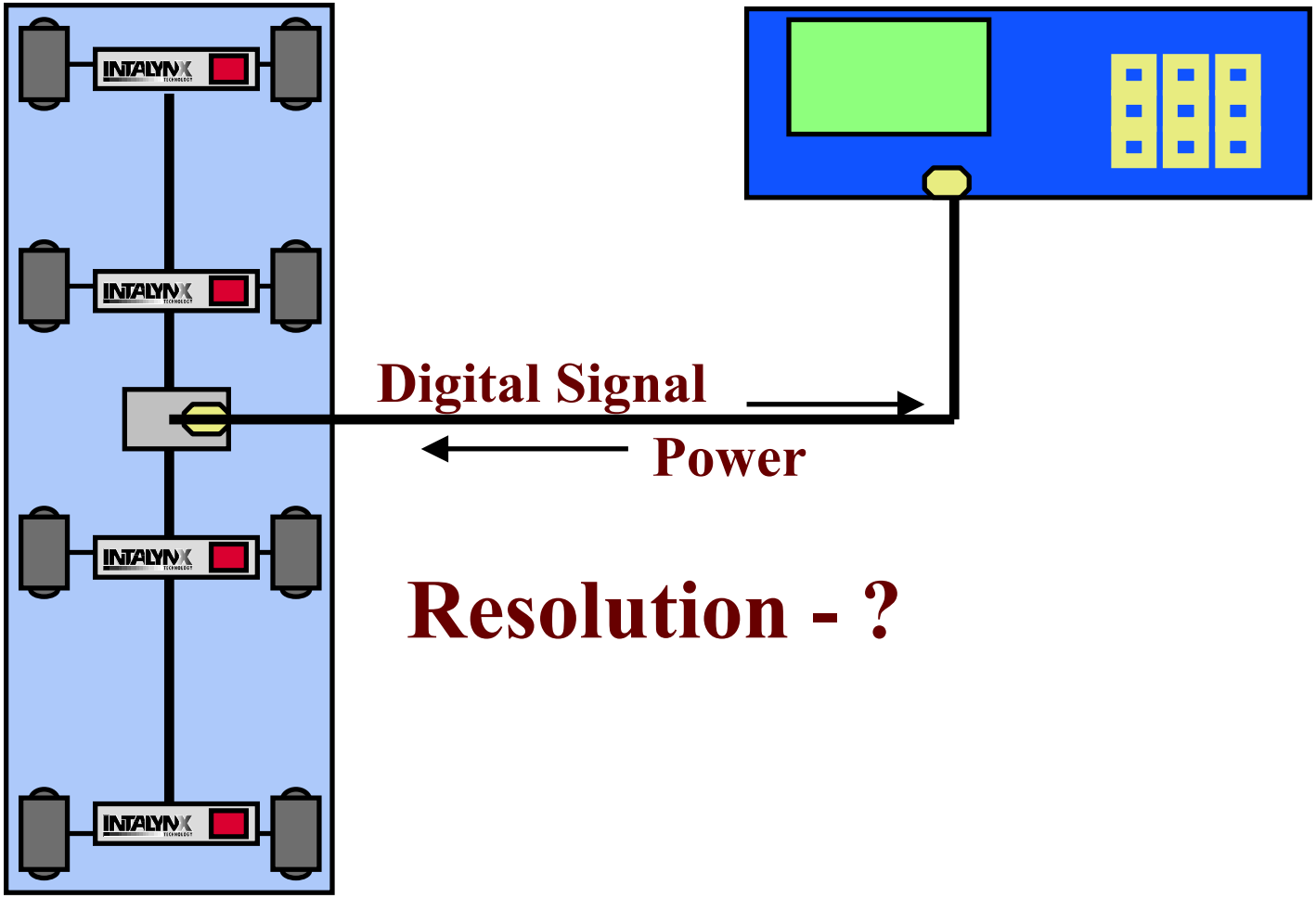


Surge Voltage Protection - The power supply and load cells are isolated providing Surge protection 8 times greater than previous technologies.

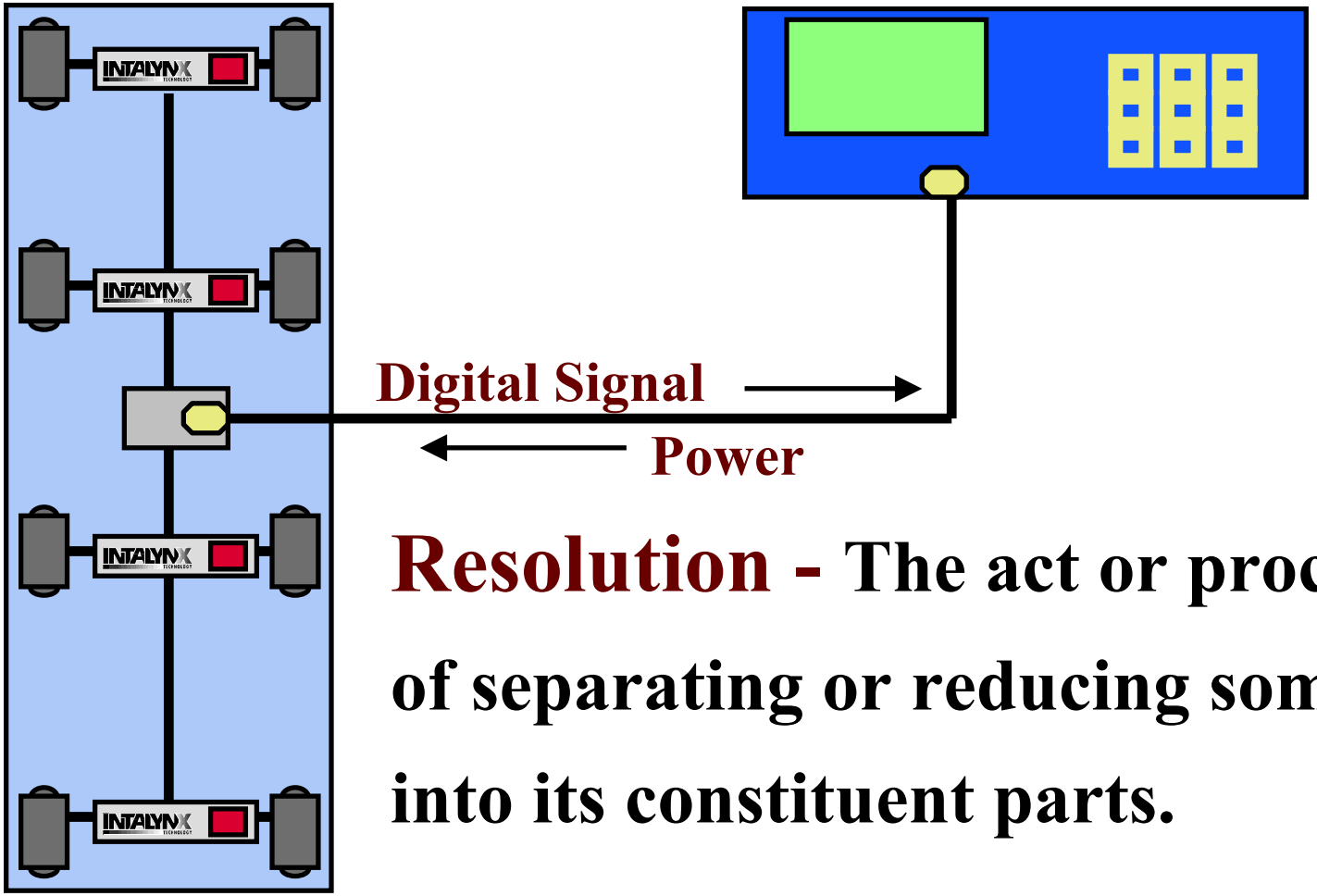
Water Resistance - Smart Sectional Controllers and Power Supply in NEMA 4X enclosures

INTALOGIX™ TECHNOLOGY



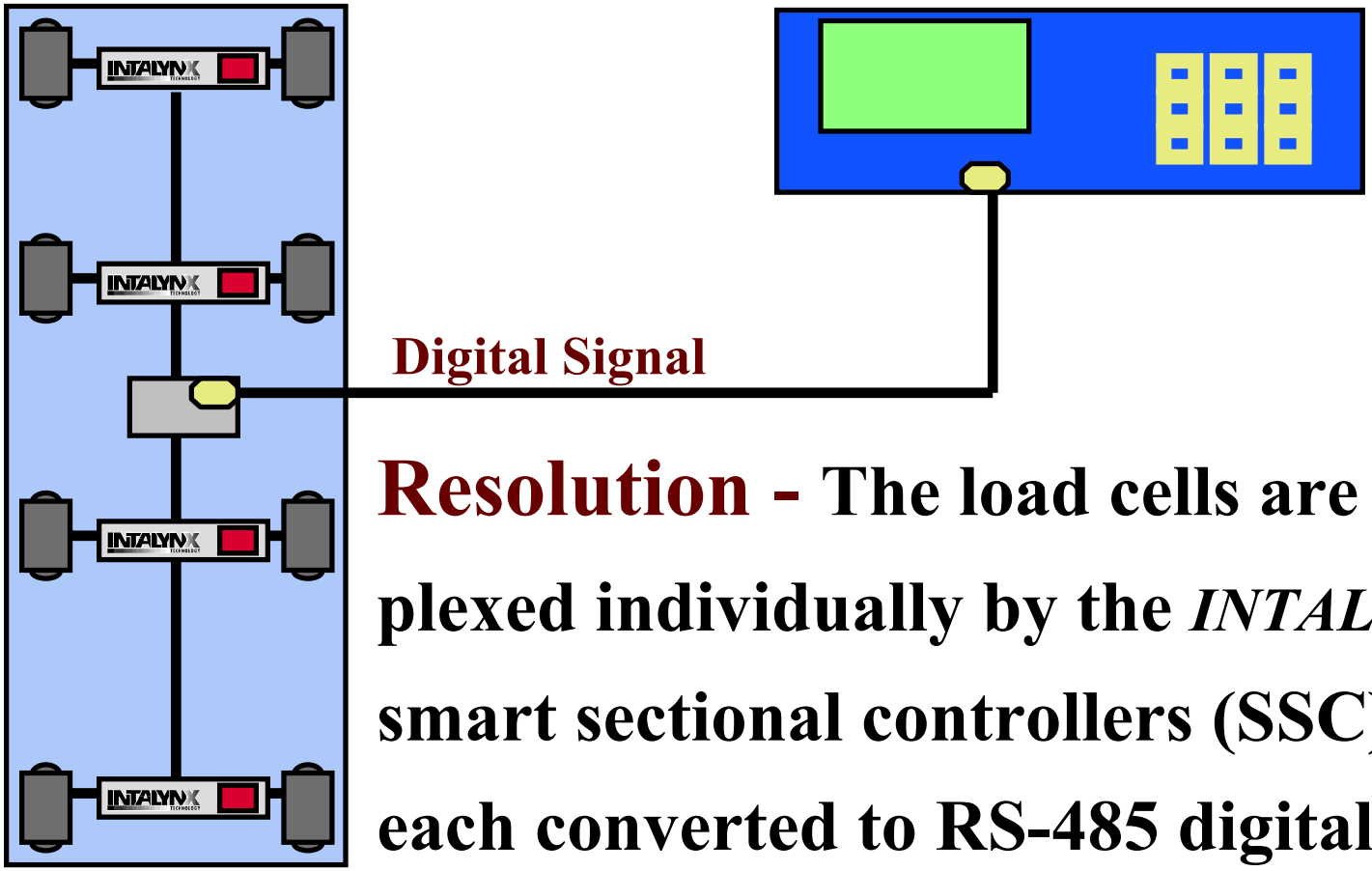
Resolution - ?

INTALOGIX™ TECHNOLOGY



Resolution - The act or process of separating or reducing something into its constituent parts.

American Heritage Dictionary



Resolution - The load cells are multi-plexed individually by the *INTALOGIX* smart sectional controllers (SSC) and each converted to RS-485 digital signal for processing by the instrument.

INTALOGIX™ TECHNOLOGY

Resolution:

*Each load cell independent

>Higher Signal Level

~Greater Stability

~Smaller Division Size *

>Simplified Diagnostics

~Track Load Cell Performance

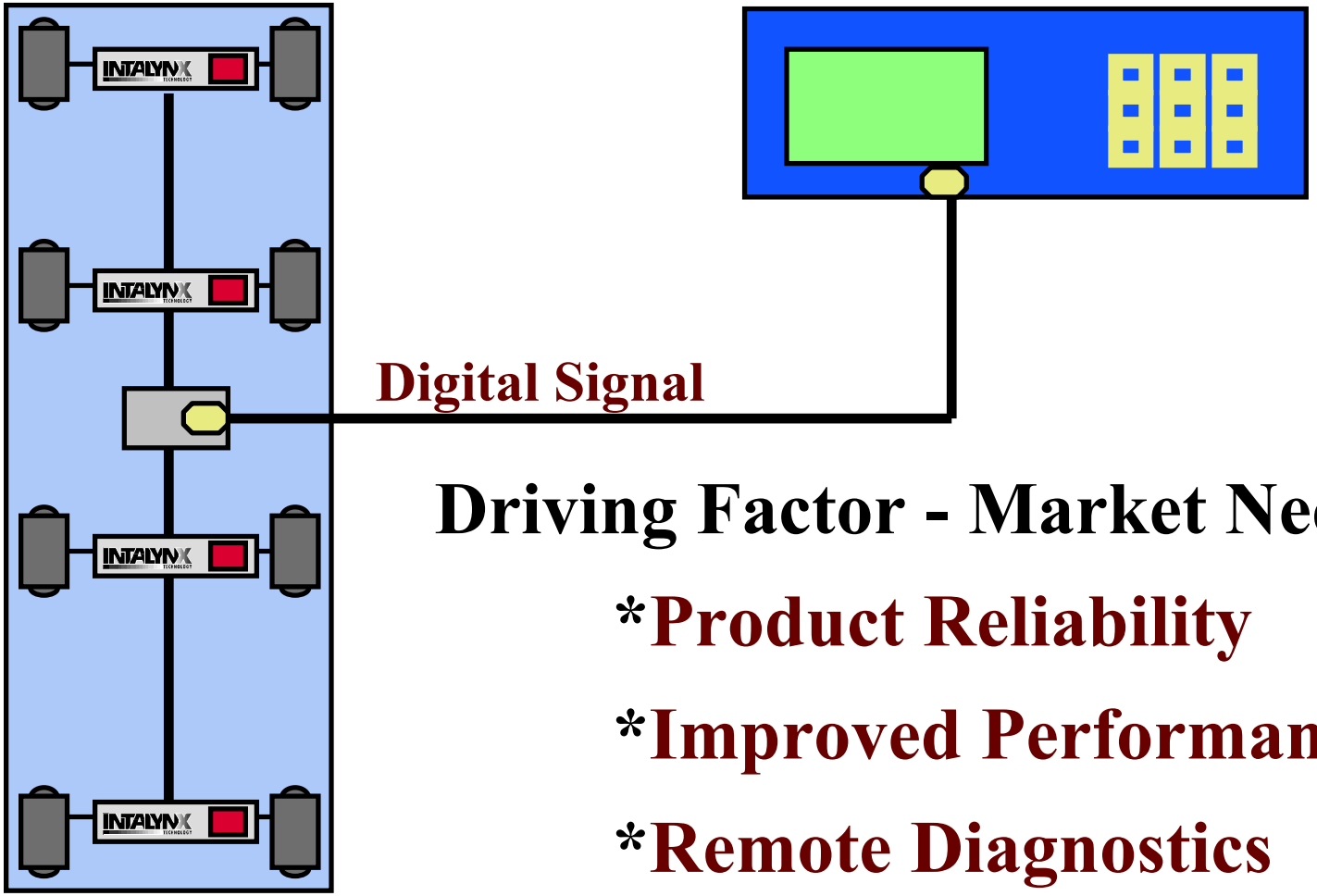
>Precision Calibration

~Individual Cell Level

>Multiple Scale

~Independent of cell characteristics

INTALOGIX™ TECHNOLOGY



Driving Factor - Market Needs

- *Product Reliability
- *Improved Performance
- *Remote Diagnostics
- *Remote Calibration

Digital Technology
FEATURES

- Digital signal from scale to instrument
  - Allows better resolution
  - Increased accuracy
  - Stronger Signal
    - Analog = 30 to 45 mV at Capacity corresponding to the amount of weight on platform
    - Digital (Intalogix) = 5 VDC Zero to Capacity regardless of weight

Digital Technology

Analog Comparison

- Analog Technology - weak signal between instrument and platform
  - 30 - 45 mV at **capacity**

nstrument provides 10 VDC excitation

oad cells have a 3mV/V rating

10 excitation

x 3 mV/V

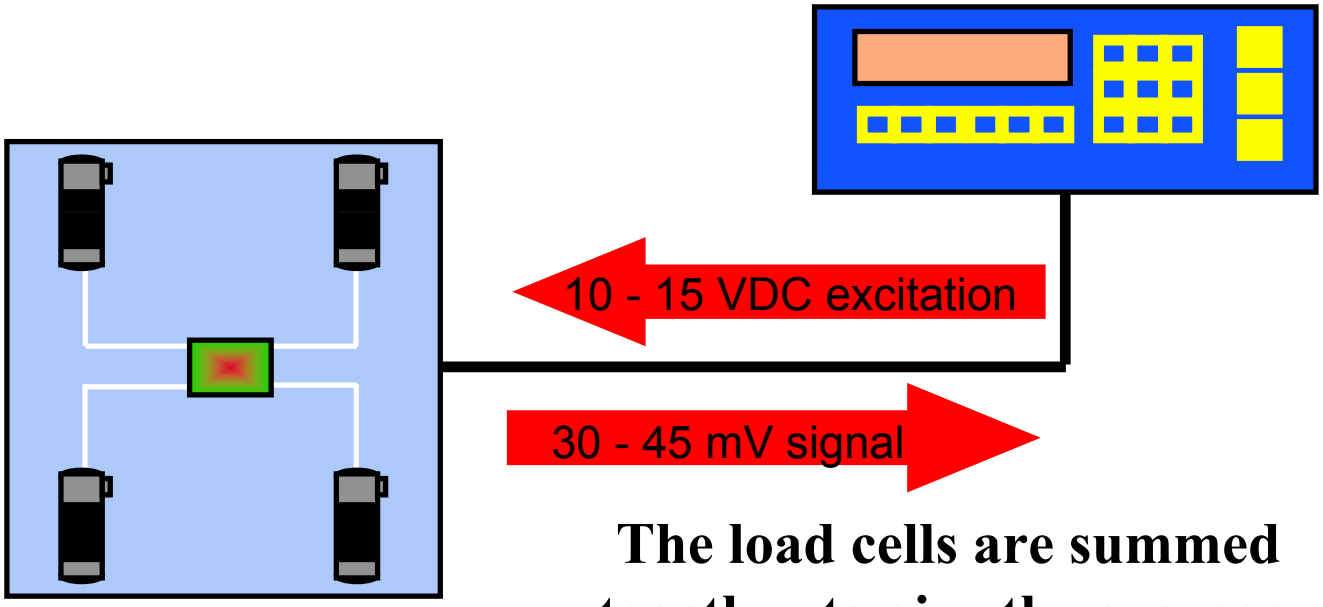
30 mV at capacity

NOTE:

Some instruments use a 15 VDC excitation

This would result in a 45 mV signal at capacity

Analog Technology



The load cells are summed together to give the average output

Digital Technology

Analog Comparison

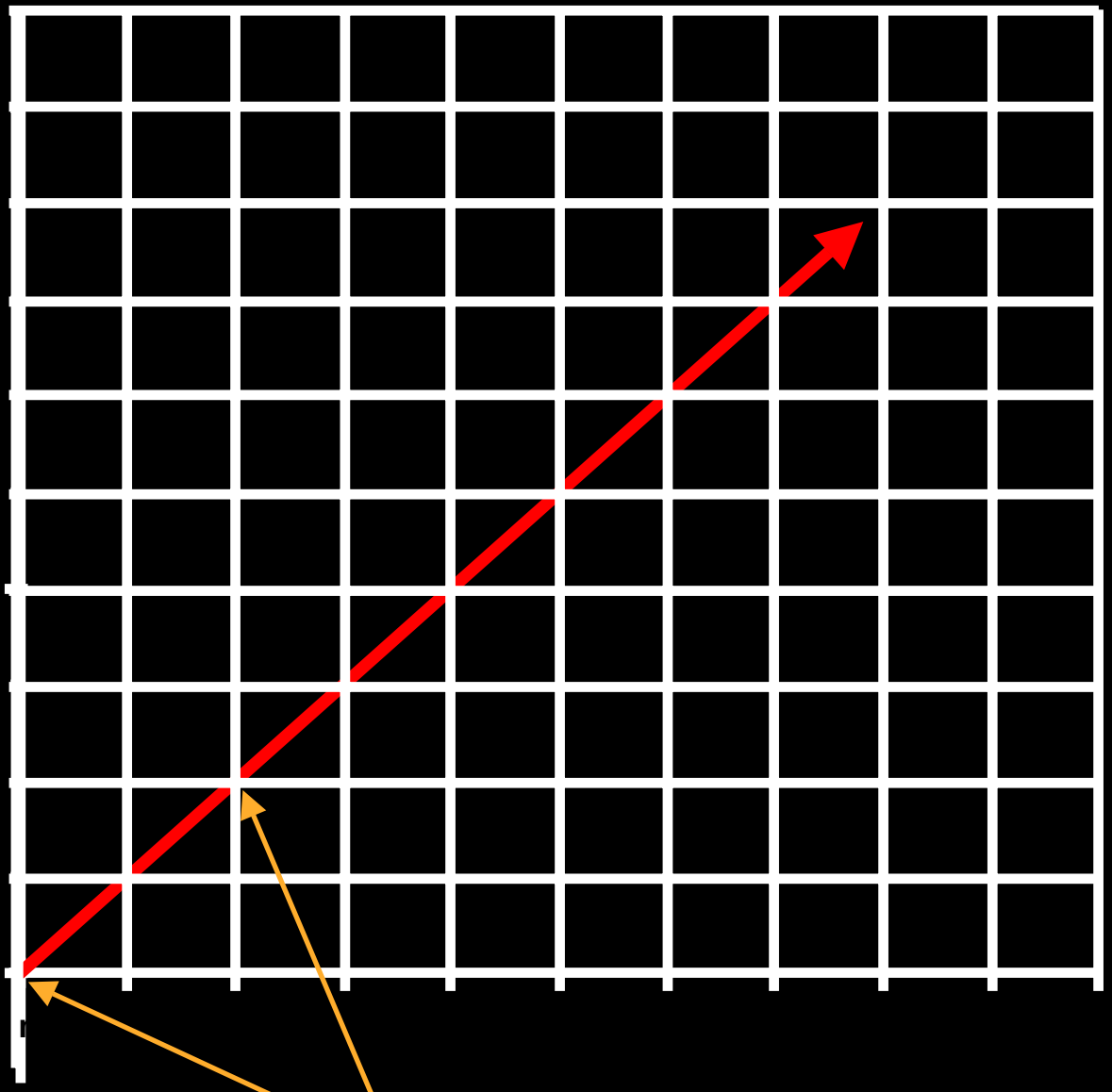
- What about at 'zero' weight or half capacity?
  - 30 - 45 mV at **capacity**
- First lets assume the scale is linear
- Meaning ... As weight is added, the signal should also increase proportionally

Digital Technology

Analog Comparison

- If the floor scale is at 'zero', the mV signal will be somewhere around 0 to 5 mV
- This is due to the weight of the platform itself setting on the load cells
- As weight is added, the signal will increase

Sample Linearity Graph



Notice a 5 mV change for 200 lbs

Digital Technology

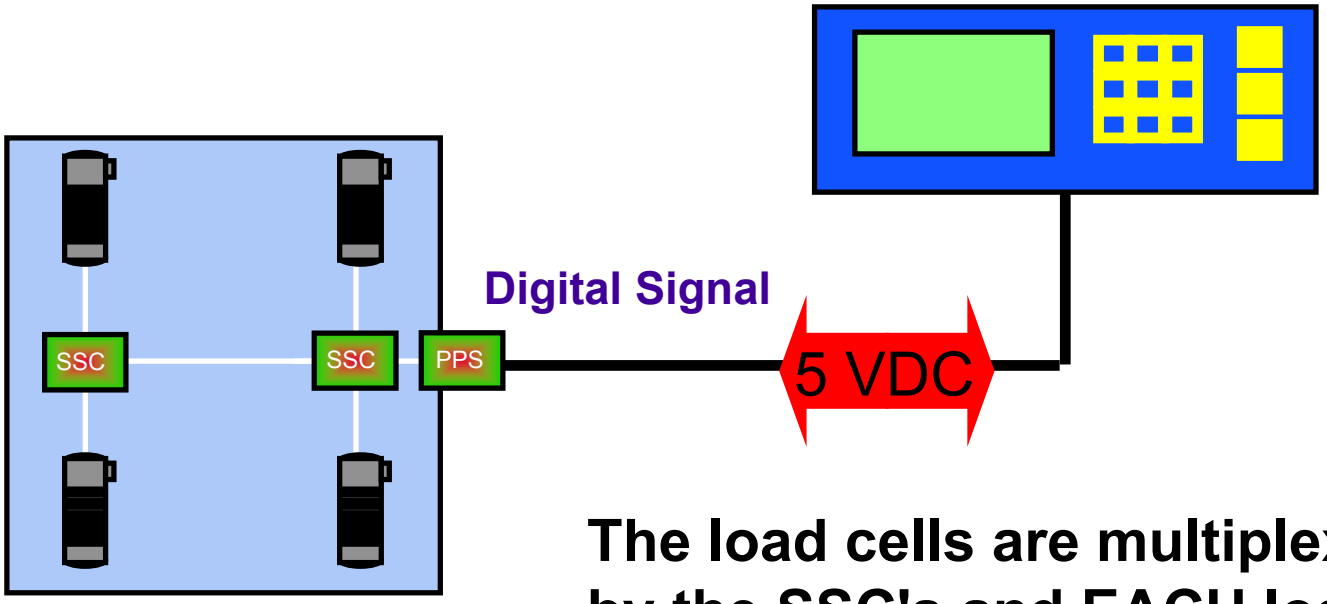
Analog Comparison

- Lets break it down into the smallest parts
- 1000 x 0.1
  - Capacity = 1000 lbs
  - Division size = 0.1 lbs
  - Total divisions = 10,000
- When we add 200 lbs, the signal in our example increases 5 mV or 0.005 VDC
- 200 lbs in 0.1 steps is 2000 divisions
- 0.005 / 2000 = 0.0000025 VDC for each 0.1 lb

Digital Technology

- Lets look at how Intalogix Technology works
- Platform to instrument signal is a digital signal
- Signal strength does NOT vary as weight changes
- Signal is a digital RS 485
  - Strength is a 5 VDC differential
    - 5.0 digital
    - 0.0000025 analog

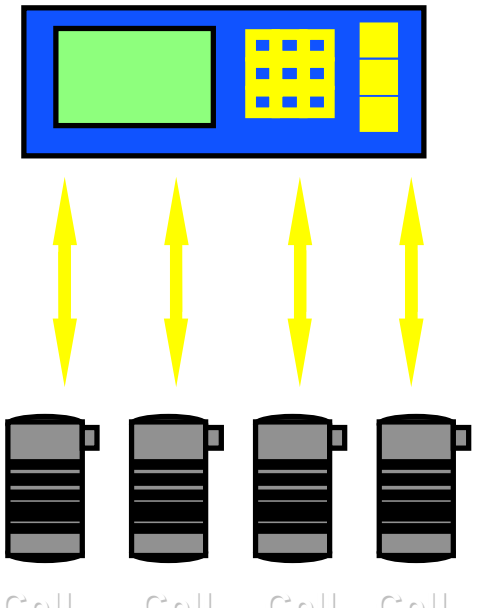
Intalogix Technology



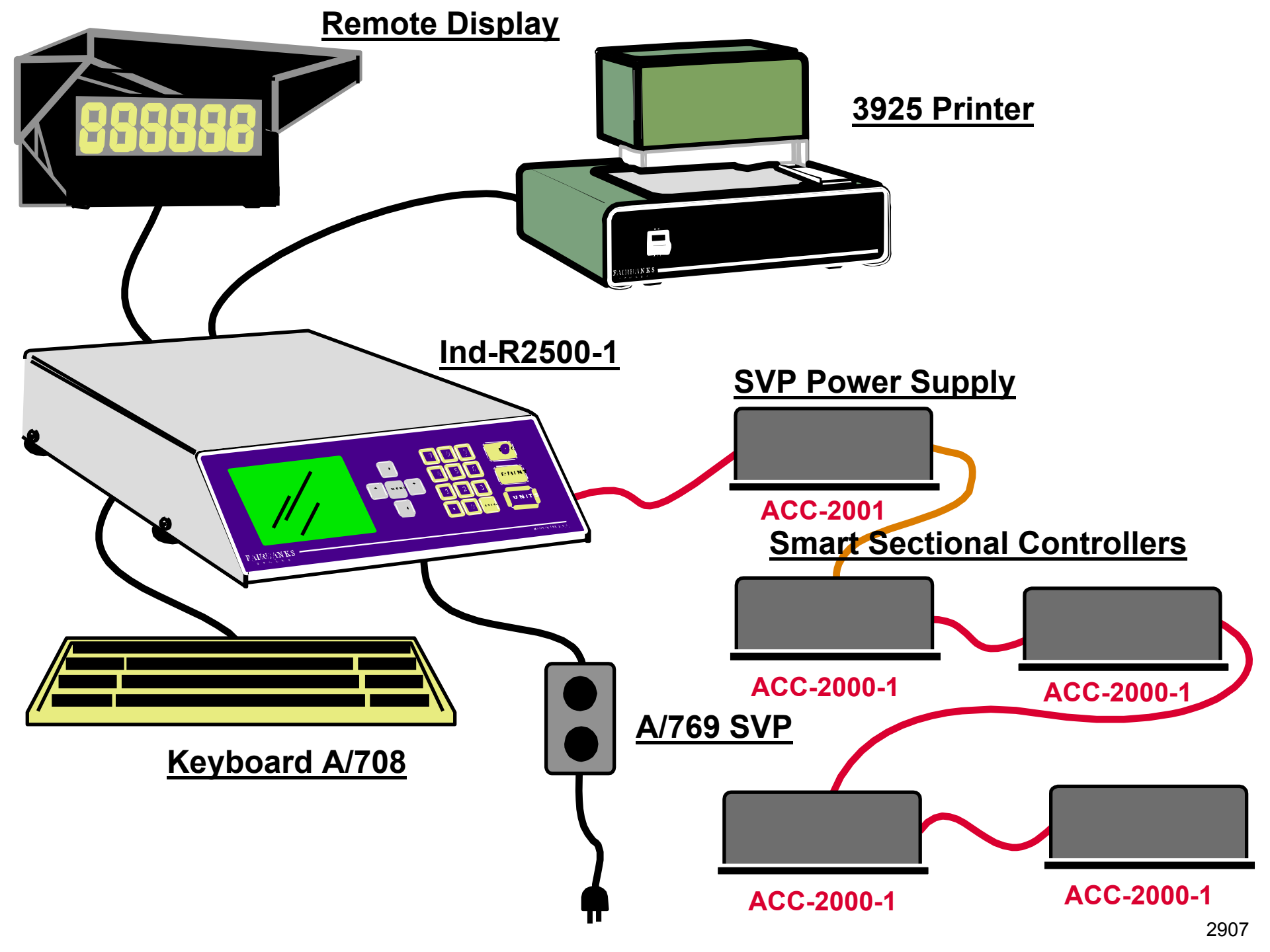
The load cells are multiplexed by the SSC's and EACH load cell signal is processed by the instrument.

Intalogix Technology

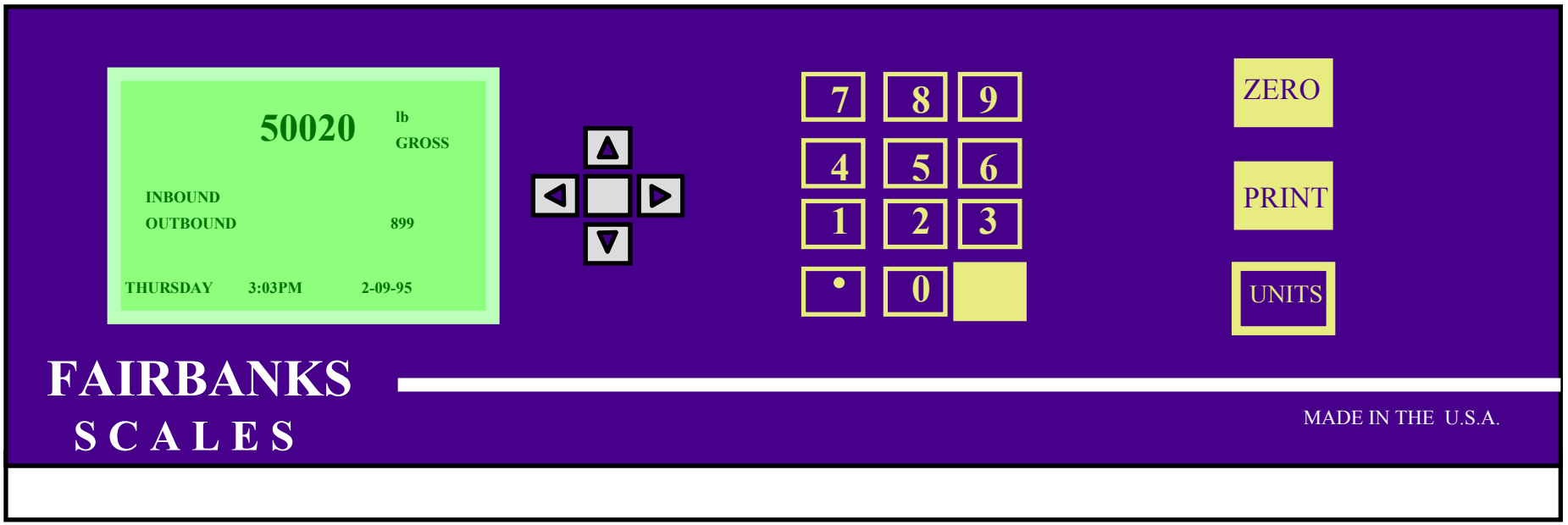
- Each cell is identified individually
- Instrument is constantly polling cells for data by ID
- Each cell is treated like its own scale



INTALOGIX™
TECHNOLOGY


Remote Display
888888
3925 Printer
Ind-R2500-1
SVP Power Supply
ACC-2001
Smart Sectional Controllers
ACC-2000-1
ACC-2000-1
A/769 SVP
ACC-2000-1
ACC-2000-1
Keyboard A/708
2907

INTALOGIX™ TECHNOLOGY



IND - R2500 Series Instruments

INTALOGIX™ TECHNOLOGY

IND - R2500 Series Instruments

* Compatible with Intalogix Technology
* Monitor all system components
* Provides system diagnostics
* Performs system calibration
* Powers up to 32 load cells and/or 4 scales
* Controls all weighing operations
* User friendly operation
* Modem compatible for remote operation

CALIBRATION GOOD

CONFIGURATION GOOD

ALL LOAD CELLS GOOD

COM2:	19200	NONE	8	1
COM3:	4800	NONE	8	1
COM4:	19200	NONE	8	1
COM5:	19200	NONE	8	1

BATTERY = 3. 2V

NO KEYBOARD

CELLS FOUND

1, 2, 3, 4, 5, 6, 7, 8

LOAD CELL (S) BAD

CHECK THAT THE SCALE IS EMPTY

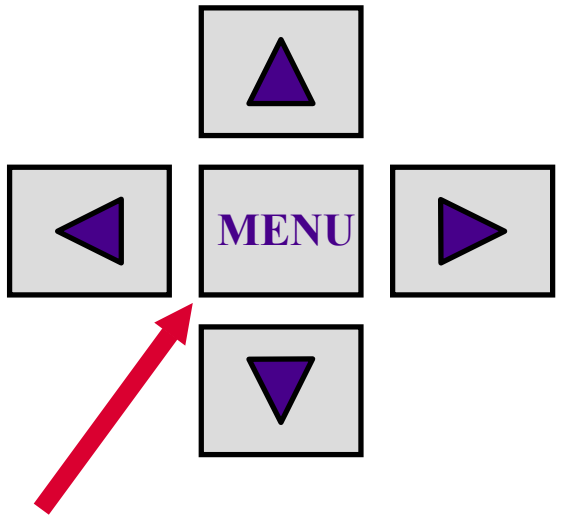
IF SCALE IS EMPTY
CALL FOR SERVICE
(800) 555-1234

OPERATE THE ZERO KEY
TO CONTINUE

50020 lb
GROSS

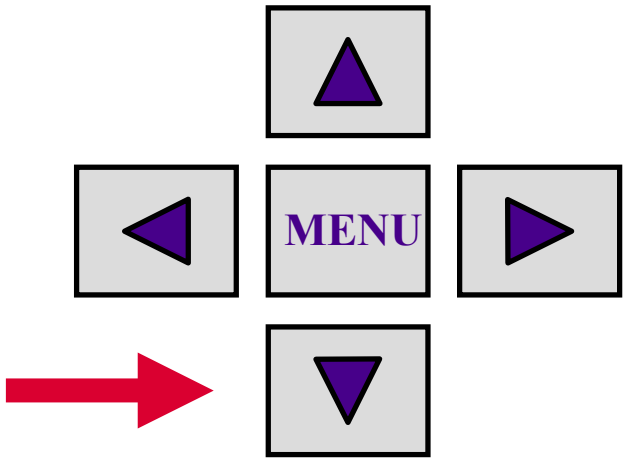
→ INBOUND
OUTBOUND 899

THURSDAY 3:03PM 2-09-95



OPERATION MENU

MENU
TIME and DATE
TICKET NUMBER
KEYBOARD TARE
AUTOTARE
AUDIT TRAIL
MODEM
CONFIGURATION MENU
SERVICE MENU



OPERATION MENU

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TIME and DATE
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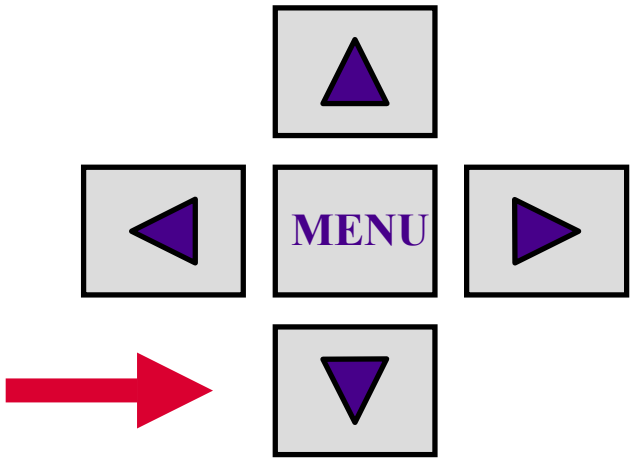
KEYBOARD TARE
AUTOTARE
AUDIT TRAIL
MODEM
CONFIGURATION MENU
SERVICE MENU



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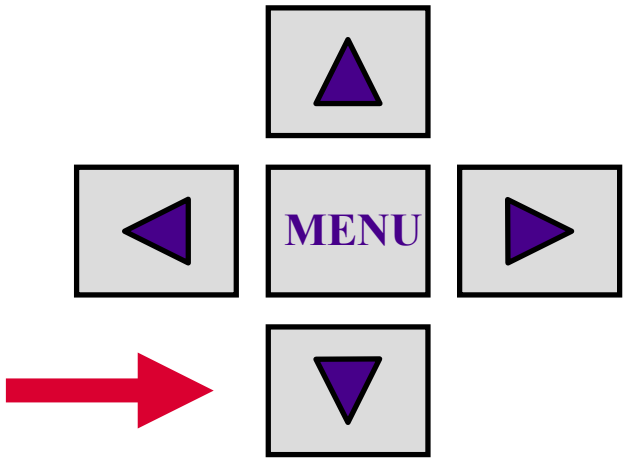

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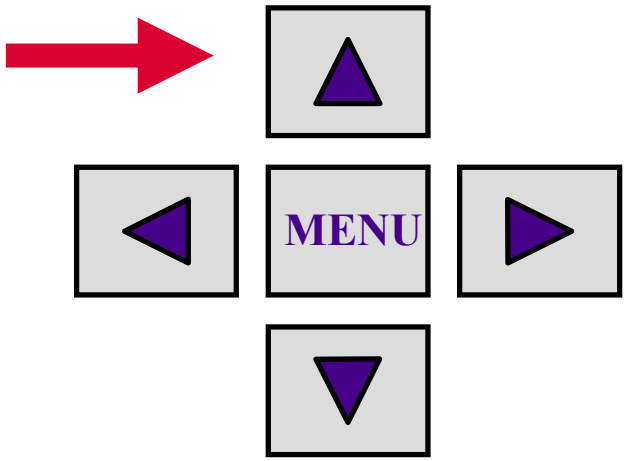

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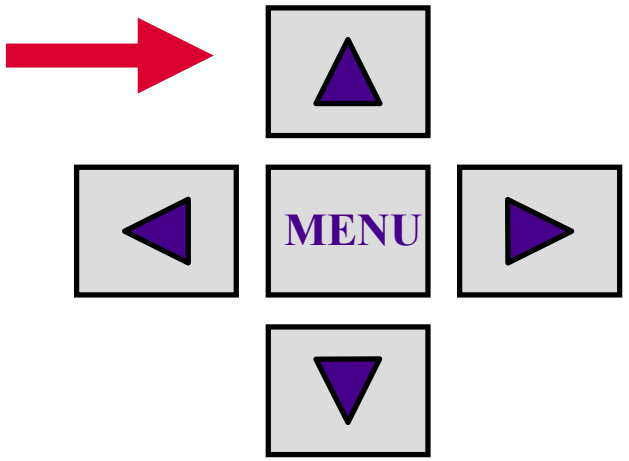

OPERATION MENU

MENU

TIME and DATE

TICKET NUMBER

KEYBOARD TARE

AUTOTARE

→ AUDIT TRAIL

MODEM SERVICE

CONFIGURATION MENU

SERVICE MENU

CALIBRATION

	TIME	DATE	COUNT
1	2:06 PM	8 - 29 - 03	15
2			
3			
4			

CONFIGURATION

	TIME	DATE	COUNT
1	4:16 PM	6 - 09 - 03	23
2			
3			
4			

OPERATE ANY KEY TO EXIT

OPERATION MENU

MENU

TIME and DATE

TICKET NUMBER

KEYBOARD TARE
AUTOTARE

AUDIT TRAIL

MODEM SERVICE

→ CONFIGURATION MENU

SERVICE MENU

CONFIGURATION MENU

OPERATION MENU

KEYBOARD TARE

AUTOTARE

SELECT SCALE

TITLE

FIELD NAMES

PRODUCT ID

MAIL ID

PROMPTS

REPORTS

DISPLAY CONTRAST

LOAD CELL DIAGNOSTICS

COMMUNICATIONS PORT

1 GOOD	2 GOOD
3 GOOD	4 GOOD
5 GOOD	6 GOOD
7 GOOD	8 GOOD

LOAD CELL FAILURES (S)

THURSDAY 3:03PM 2-09-95

THURSDAY 3:03PM 2-09-95

LOAD CELL FAILURES (S)

THURSDAY 3:03PM 2-09-95

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LOAD CELL FAILURES (S)

THURSDAY 3:03PM 2-09-95

OPERATION MENU

MENU

TIME and DATE

TICKET NUMBER

KEYBOARD TARE
AUTOTARE

AUDIT TRAIL

MODEM SERVICE

CONFIGURATION MENU

→ SERVICE MENU

SERVICE MENU

OPERATION MENU

OPERATING MODE

UPDATE RATE

ZERO MODE

TARE MODE

NUMBER SCALES

CELL OUTPUT (COUNTS)

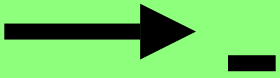
CALIBRATION

WRITE PASSWORD

PRINT CALIBRATION REPORT

SPECIAL FUNCTIONS

NUMBER SCALES 1



SERVICE MENU

OPERATION MENU

OPERATING MODE

UPDATE RATE

ZERO MODE

TARE MODE

NUMBER SCALES

CELL OUTPUT COUNTS

CALIBRATION

WRITE PASSWORD

PRINT CALIBRATION REPORT

SPECIAL FUNCTIONS

CELL	CALIBRATION	CURRENT
1	16432	16122
2	16900	17002
3	15310	15378
4	15982	16100
5	16985	17087
6	15863	16086
7	15524	15689
8	15966	16200

CELL	CALIBRATION	CURRENT
1	16432	18526
2	16900	17475
3	15310	14897
4	15982	16345
5	16985	17287
6	15863	16586
7	15524	15897
8	15966	16350

CELL	CALIBRATION	CURRENT
1	16432	18825
2	16900	17002
3	15310	15378
4	15982	16100
5	16985	17087
6	15863	16086
7	15524	15689
8	15966	16200

CELL	CALIBRATION	CURRENT
1	16432	18526
2	16900	17475
3	15310	14897
4	15982	16345
5	16985	17287
6	15863	16586
7	15524	15897
8	15966	16350

CELL	CALIBRATION	CURRENT
1	16432	25825
2	16900	17002
3	15310	15378
4	15982	16100
5	16985	17087
6	15863	16086
7	15524	15689
8	15966	16200

SERVICE MENU

OPERATION MENU

OPERATING MODE

UPDATE RATE

ZERO MODE

TARE MODE

NUMBER SCALES

CELL OUTPUT COUNTS

→ CALIBRATION

WRITE PASSWORD

PRINT CALIBRATION REPORT

SPECIAL FUNCTIONS

CALIBRATION MENU

SERVICE MENU

SCALE ID X

SCALE UNITS

DIVISION SIZE

MOTION BAND

AUTO ZERO TRACKING BAND

FILTER FACTOR

FIRST CELL ID

LAST CELL ID

FLOAT SWITCH LOCATION

CELL CAPACITY

SCALE CAPACITY

TEST LOAD

CELL SENSITIVITY mV/V

SPAN (SECTIONS)

TRIM, CELL/SECTION/SCALE

CELL SENSITIVITY

<MENU>	
CELL	X
SENSITIVITY	0.0000mV/V
RESISTANCE	XXX Ohms
CALIBRATE	

CELL GROUP 1-4

CALIBRATION MENU

SERVICE MENU

SCALE ID X

SCALE UNITS

DIVISION SIZE

MOTION BAND

AUTO ZERO TRACKING BAND

FILTER FACTOR

FIRST CELL ID

LAST CELL ID

FLOAT SWITCH LOCATION

CELL CAPACITY

SCALE CAPACITY

TEST LOAD

CELL SENSITIVITY mV/V

SPAN (SECTIONS)

TRIM, CELL/SECTION/SCALE

CENTER TRUCK
OVER SECTION 1
OPERATE ENTER
KEY WHEN READY

SECTION 1 COUNTS
XXXXXX
TOTAL COUNTS

CALIBRATION MENU

SERVICE MENU

SCALE ID X

SCALE UNITS

DIVISION SIZE

MOTION BAND

AUTO ZERO TRACKING BAND

FILTER FACTOR

FIRST CELL ID

LAST CELL ID

FLOAT SWITCH LOCATION

CELL CAPACITY

SCALE CAPACITY

TEST LOAD

CELL SENSITIVITY mV/V

SPAN (SECTIONS)

→ TRIM, CELL/SECTION/SCALE

XXXXXX

<MENU>

TRIM CELL

TRIM SECTION

TRIM SCALE

CELL GROUP 1-8

SERVICE MENU

OPERATION MENU

OPERATING MODE

UPDATE RATE

ZERO MODE

TARE MODE

NUMBER SCALES

CELL OUTPUT COUNTS

CALIBRATION

WRITE PASSWORD

PRINT CALIBRATION REPORT

SPECIAL FUNCTIONS

SPECIAL FUNCTIONS MENU

SERVICE MENU

→ SPAN (CORNERS)

HYSTERISIS

SERVICE INFORMATION

RESET SECTION PEAKS

PEAK WEIGHTS

CLEAR ALL MEMORY

OPERATION MENU

MENU

TIME and DATE

TICKET NUMBER

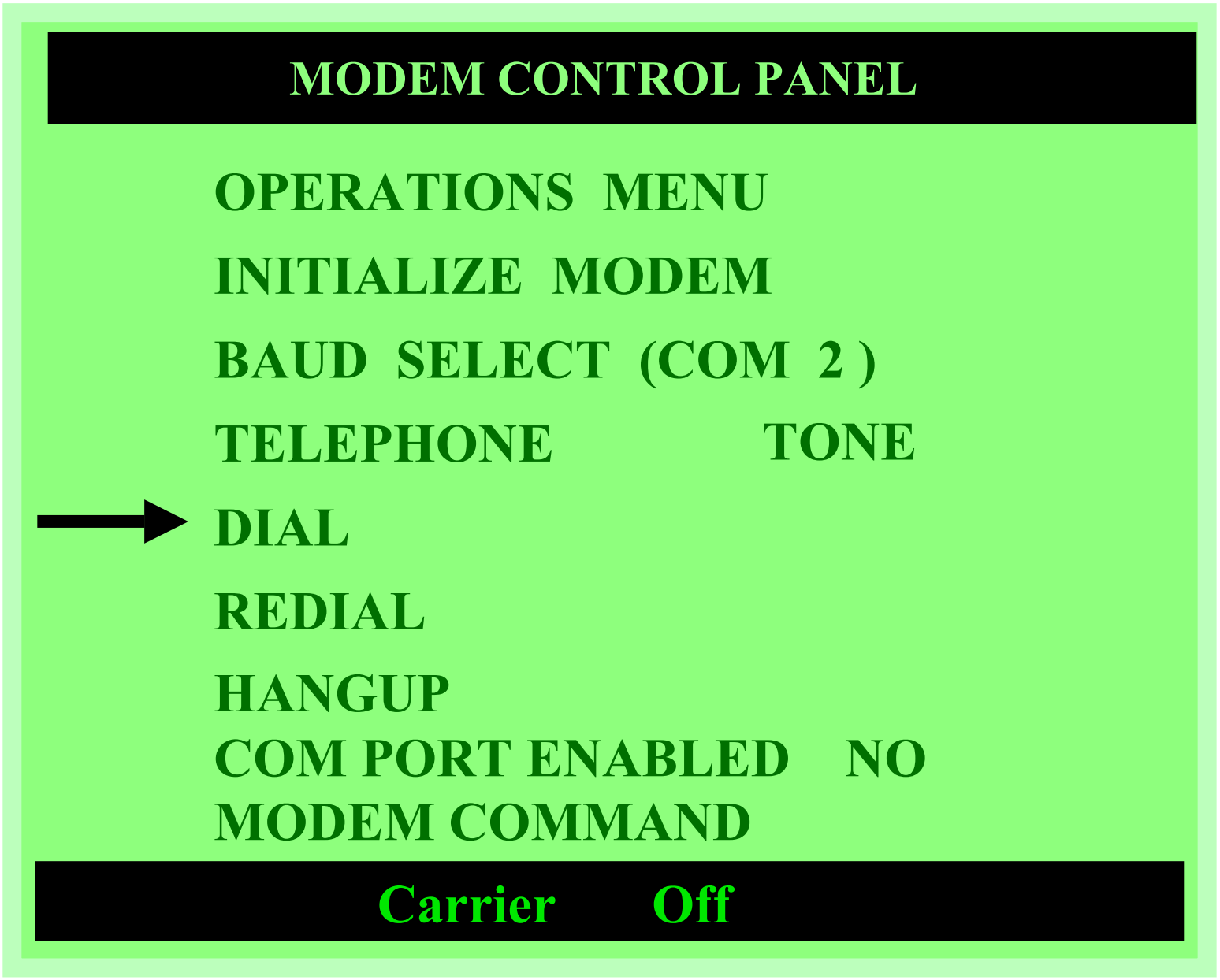
KEYBOARD TARE
AUTOTARE

AUDIT TRAIL

→ MODEM SERVICE

CONFIGURATION MENU

SERVICE MENU


MODEM CONTROL PANEL
OPERATIONS MENU
INITIALIZE MODEM
BAUD SELECT (COM 2)
TELEPHONE TONE
DIAL
REDIAL
HANGUP
COM PORT ENABLED NO
MODEM COMMAND
Carrier Off

MODEM CONTROL PANEL

OPERATIONS MENU

INITIALIZE MODEM

BAUD SELECT (COM 2)

TELEPHONE TONE

_

REDIAL

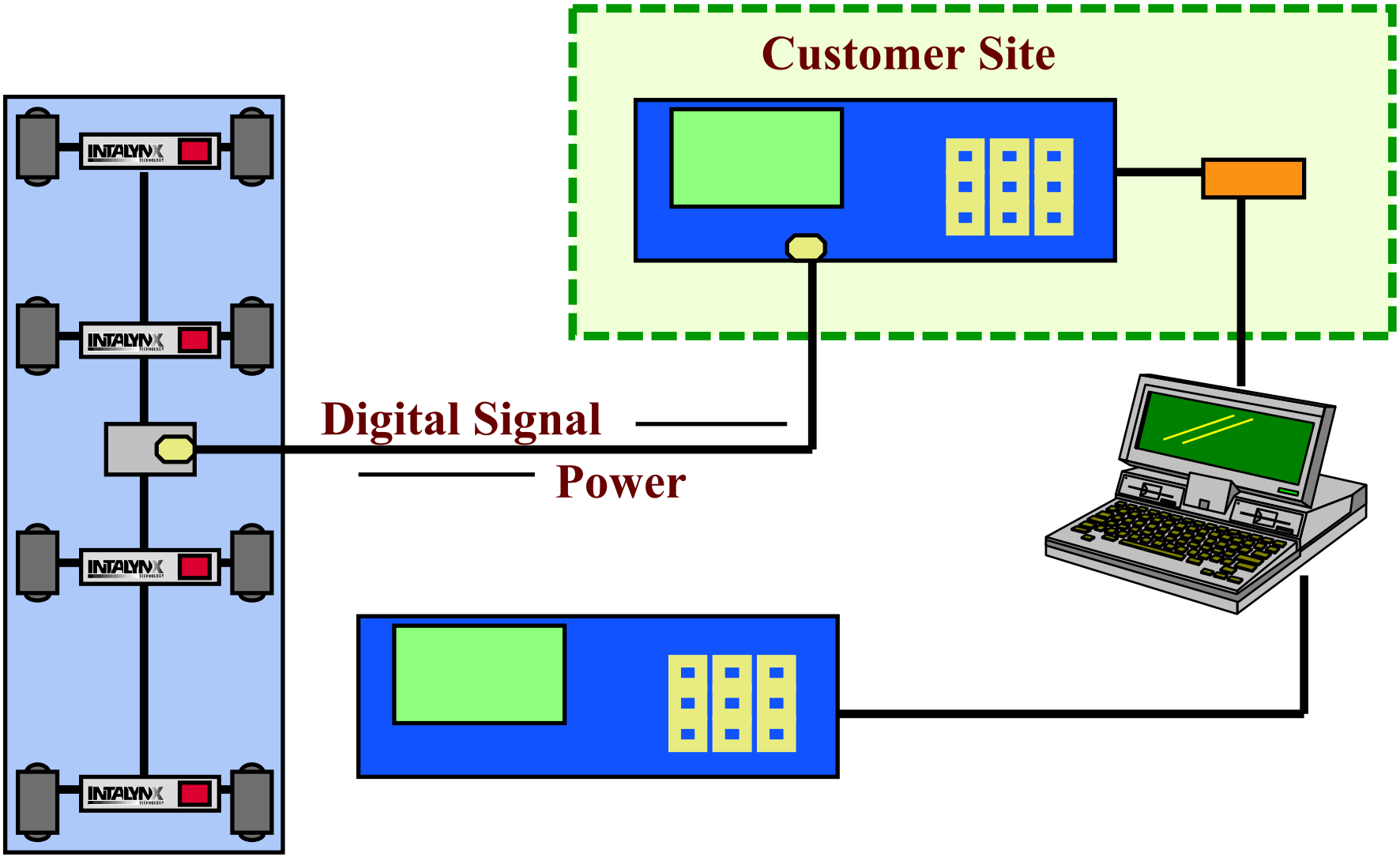
HANGUP

COM PORT ENABLED NO

MODEM COMMAND

Carrier Off

INTALOGIX™ TECHNOLOGY



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