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# Time Efficient Measurements based on new Measurement System Controller

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ATMS 2012  
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All the space you need



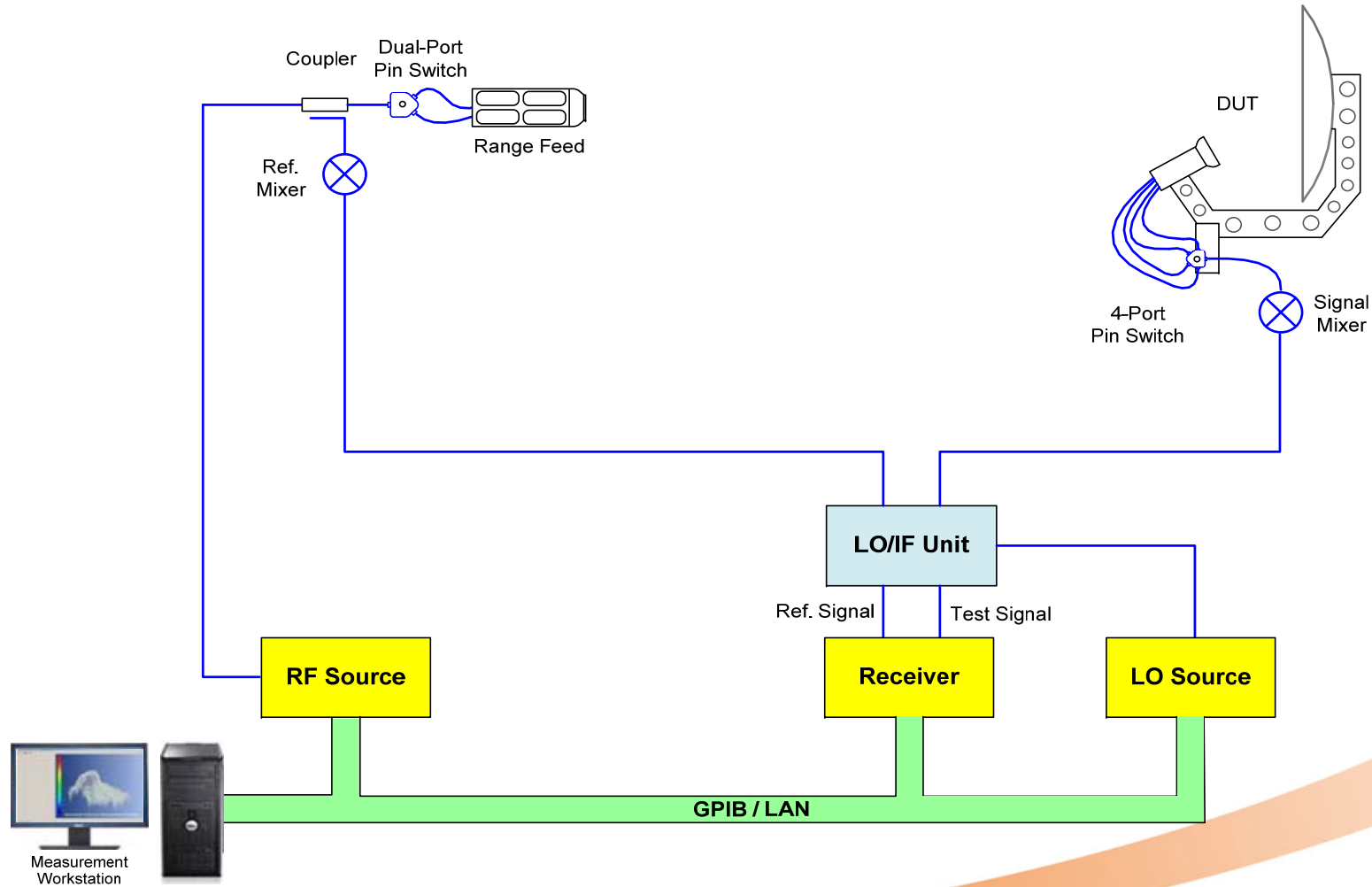
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# 1. Introduction

- **After about 40 Years there is a new Generation of RF Test Equipment for Antenna Measurement available**
- **This new Instrumentation enables new Antenna Measurement Solutions**
- **The new Measurement System Controller constitutes the Base Unit for new Antenna Measurement Solutions**

# 2. System Overview



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## 3. New Generation of Instruments

- **Faster Antenna Receiver**
  - N5242A - PNA-X
  - N5264A - Firefly
  
- **Faster RF Sources**
  - N5183A - MXG
  
- **Faster Power Meter**
  - N1913A

# 4. Key Values

## Measurement and Switching Times

### ■ Former Instrumentation

- Measurement Time 8530 : 0.400 ms
- Freq. Switching 836x : 5 ms

### ■ New Instrumentation

- Measurement Time PNA-X : 0.120 ms (IFBW 10kHz)
- Freq. Switching MXG : 0.56 ms

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## 5. Antenna Measurement Concepts

- **Static Measurements at dedicated Positions**  
(discrete Positioning for each Measurement Position)
  
- **Dynamic Measurements on the Fly**  
(Scanning Continuously)

## 5.1 Static Measurements at dedicated Positions

- Positioning to a dedicated Location
- Frequency Sweep
- Transformation to Time Domain
- Advantage:
  - Reduction of Disturbers by Time Domain Transformation
- Disadvantages :
  - Either long Measurement Time
  - Or only a few Measurement Points



## 5.2 Dynamic Measurements on the Fly

- **Performing Scans from A to B**
- **Measurement Burst at each Grid Point in a Distance C**
- **Advantage**
  - **Fast Measurement combined with a very high Grid Point Density**
- **Condition**
  - **Requires a very fast High Tech Instrumentation and a really Real Time Antenna Measurement Controller**

## 6 Measurement System Controller (MSC3001)

- **Design Goals**
- **Product Overview**
- **Functional Units of MSC 3001**

# 6.1 Measurement System Controller (MSC3001)

## Desing Goals

- **Fast Test Control**
- **Replacement of Agilent 85330**
  - **Command Compatibility with Agilent 85330**
  - **Electrical Interfaces Compatibility of with Agilent 85330**
- **Hardware Platform not PC based**
- **No Windows Operating System**
- **Remote control via GPIB or LAN using SCPI command standard**
- **Manual control via touch screen**
- **Custom Specific Tailoring**
- **Extendability**

## 6.2 Measurement System Controller (MSC3001) Product Overview

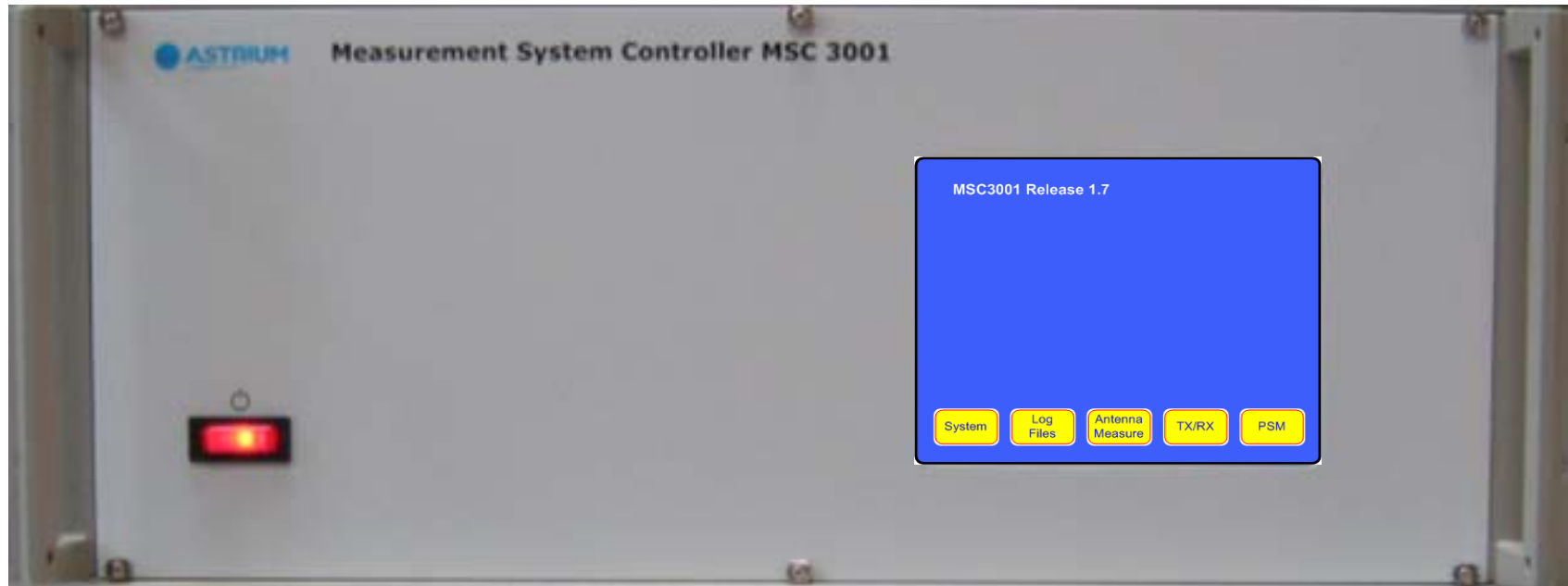
- **Full Replacement of obsolete MCC**
- **Functional, Command and Pin compatible**
- **Additional Capabilities :**
  - **Frequency / Channel Pair Switching**
  - **Rx / Tx Switching**
  - **Power Sensor Multiplexer**
  - **Control of active Antennas**

## 6.3 Measurement System Controller (MSC3001)

### Functional Units of MSC 3001

- **Fast Test Control by Antenna Measurement Controller**
- **Rx / Tx Controller**
- **Power Sensor Multiplexer**

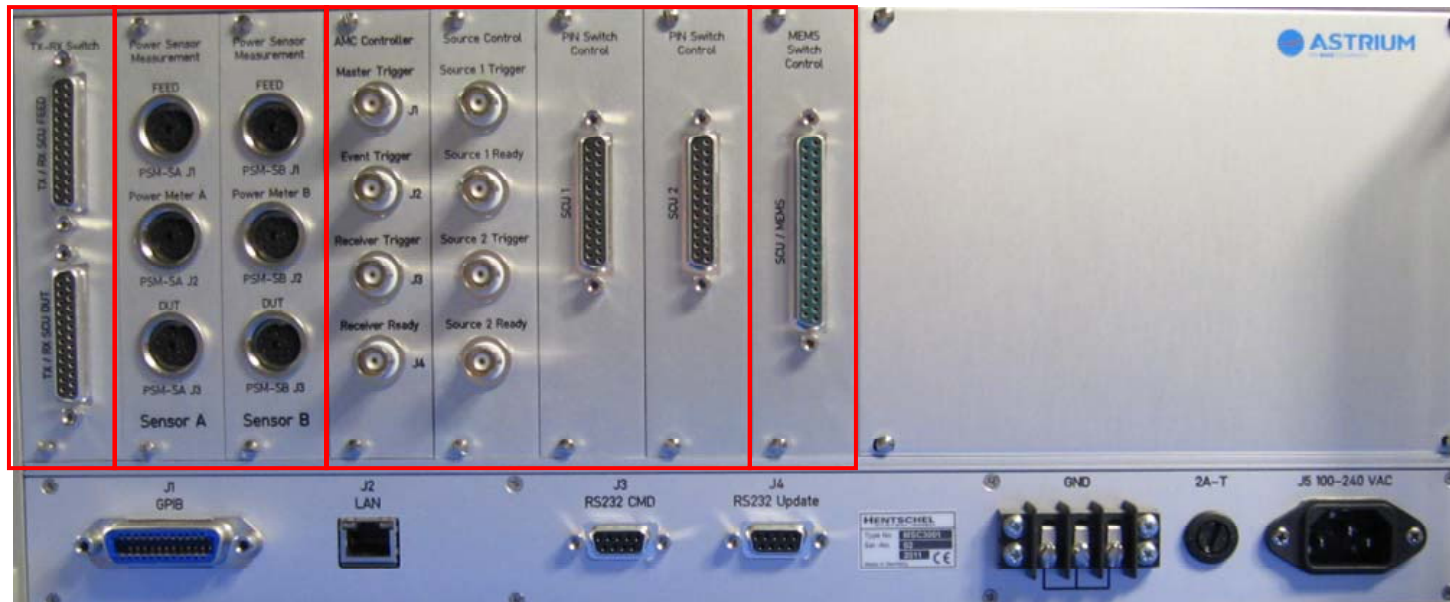
# 6.4 Measurement System Controller (MSC3001) Front Panel



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# 6.4 Measurement System Controller (MSC3001)

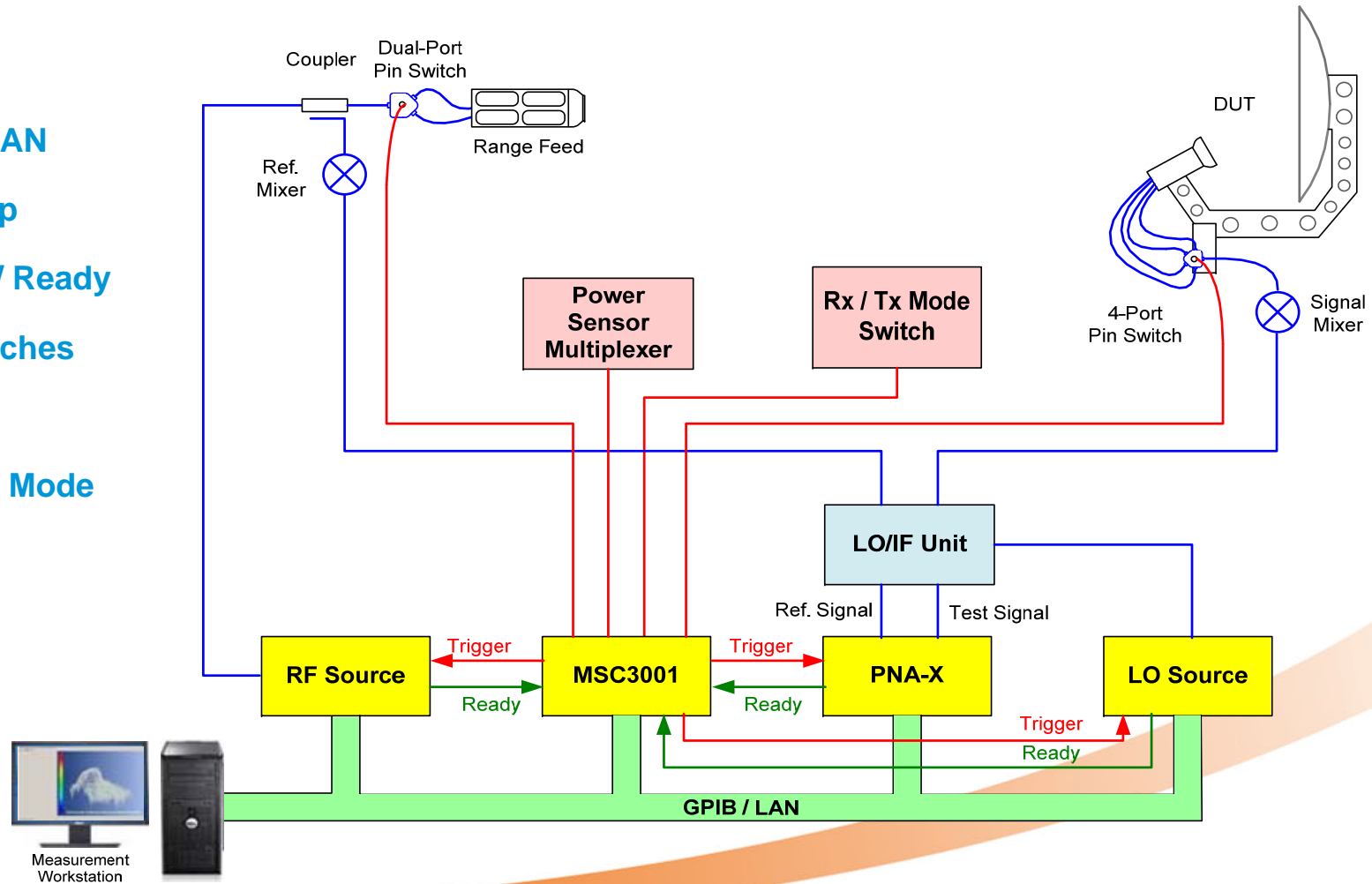
## Rear Panel



**Tx/Rx Control**  
**Antenna Measurement**  
**MEMS Switch Control**  
**Power Sensor Multiplexer**

# 7.1 Antenna Measurement Controller Test Environment

- GPIB / LAN
- RF-Setup
- Trigger / Ready
- Pin Switches
- PSM
- Rx / Tx - Mode

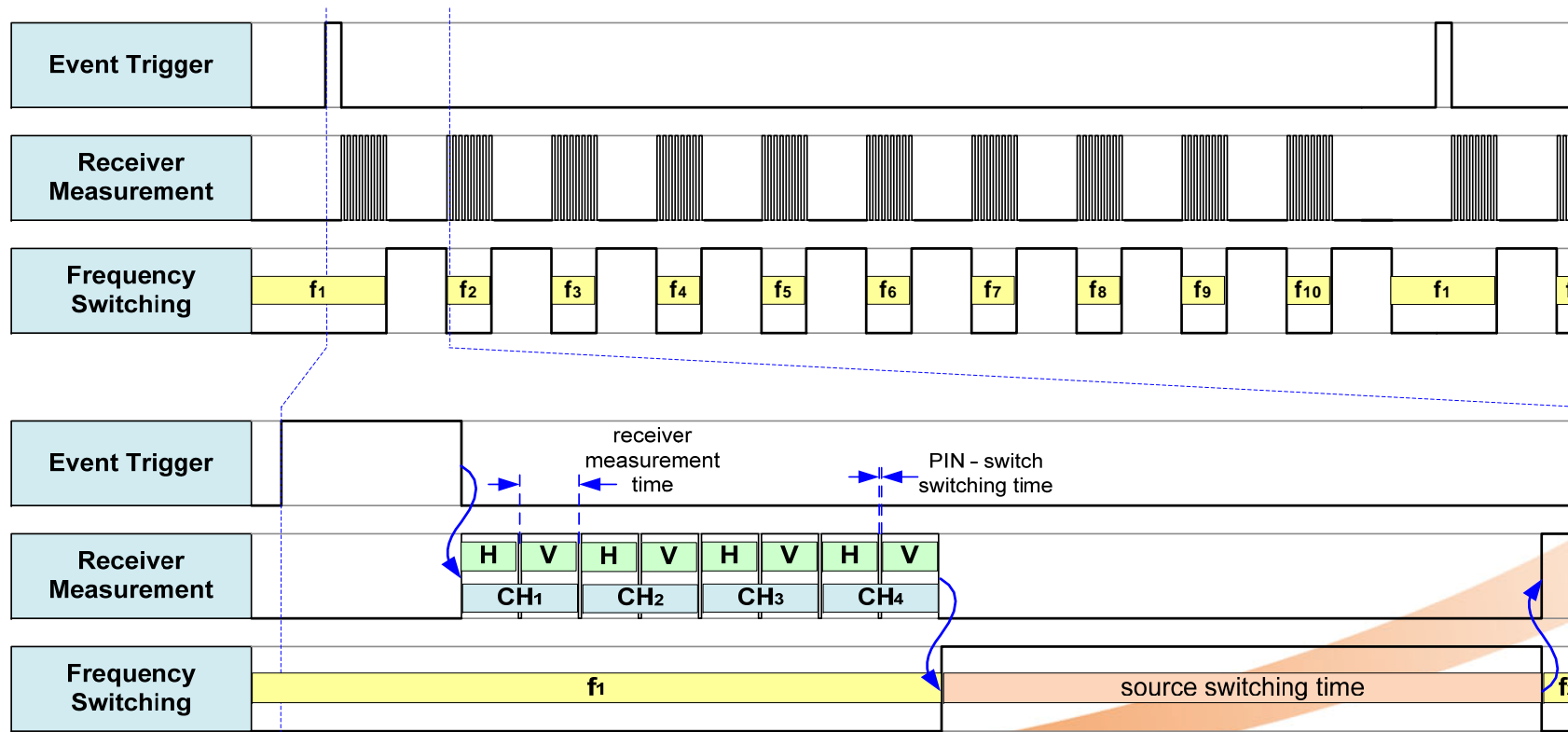


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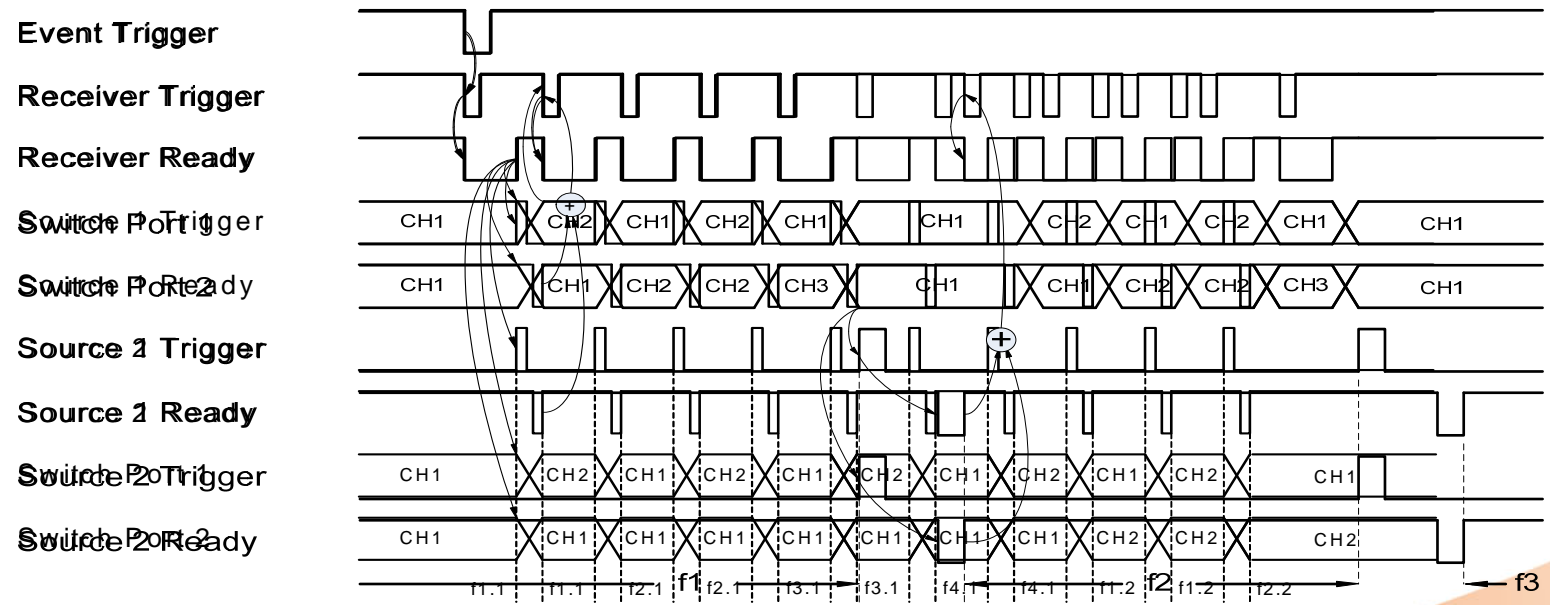
# 7.2 Antenna Measurement Controller Real Time Capability

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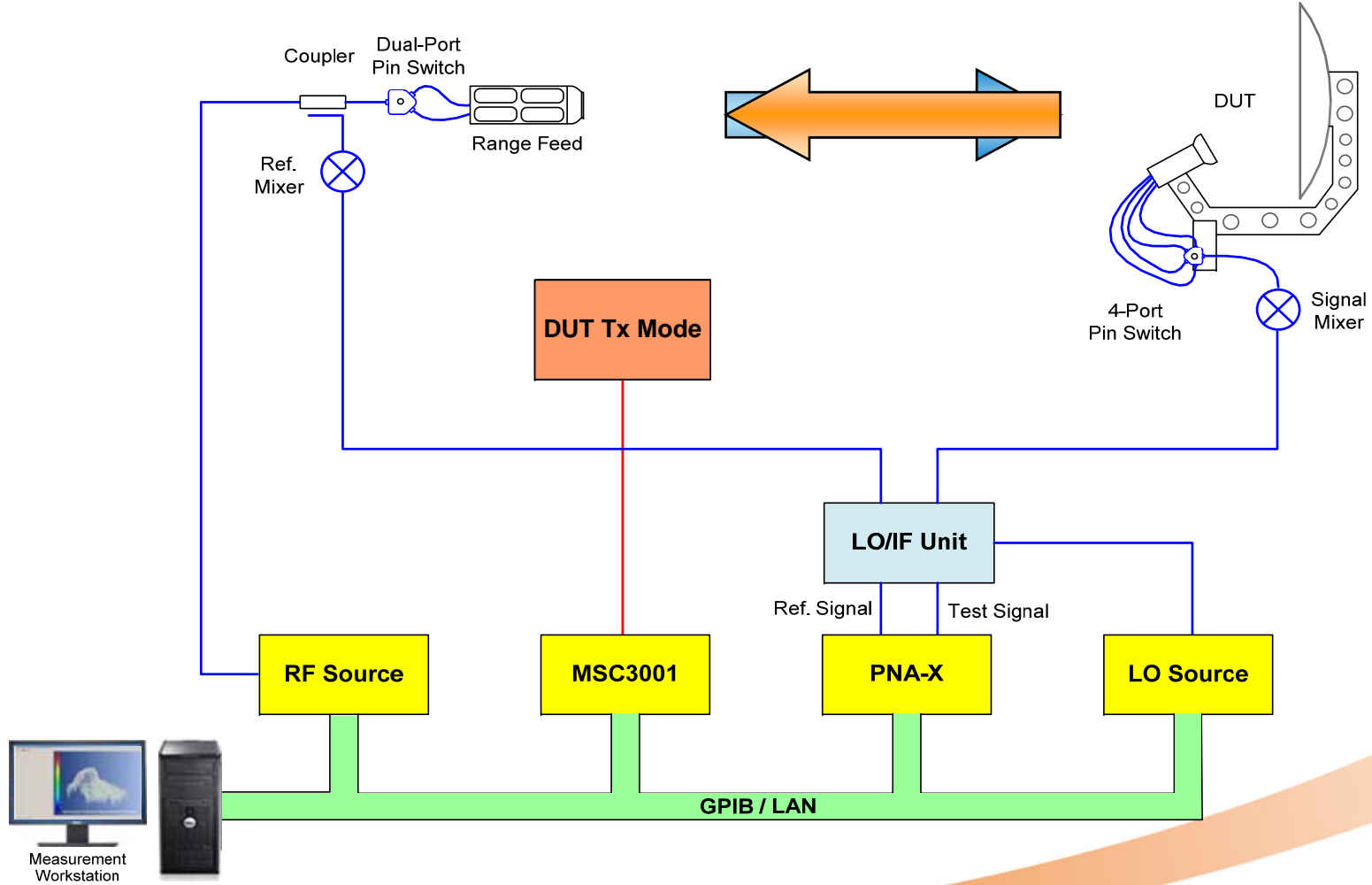


# 7.3 Antenna Measurement Controller Further Capabilities

## Frequency / Channel Pair Switching



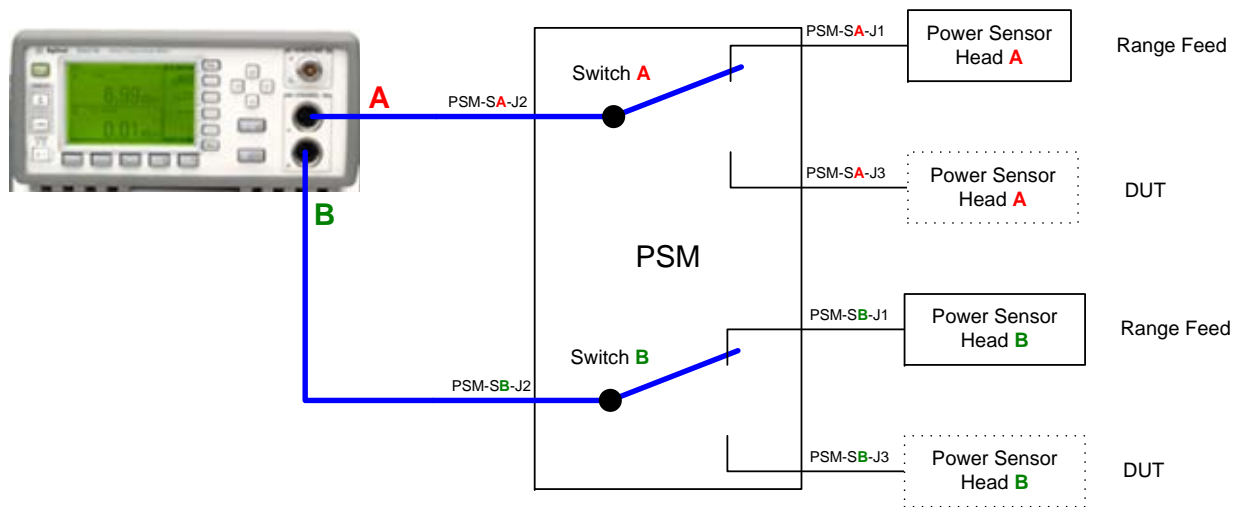
# 8. Rx/Tx Controller



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# 9. Power Sensor Multiplexer (PSM)

- Assistance Guide for Gain Measurement



# 9.1 Power Sensor Multiplexer (PSM)

## Compatibilities of PSM

### ■ Compatible with Power Meter

- HP437
- HP438
- E4418
- E4419
- N1913
- B1914A

### ■ Pin compatible with Power Sensor

- 848x
- N848x
- N930x
- E44x

# 10 Further Extensions

- **Pulse Option for RCS**
- **Control of active Antennas**
- **Trigger Capabilities for Laser Tracker**

# 11. Custom Specific Tailoring

## Examples for Customized Assemblies



- Tx/Rx Control
- Power Sensor Multiplexer
- Antenna Measurement Controller



- Only Antenna Measurement Controller

- Tx/Rx Control
- Antenna Measurement Controller with MEMS Control



# 12. Technical Discussion

**Thank You for Your Attention**

**Any Questions?**



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