

## PM30 high performance PC based Pulser Receiver



- Unbeatable performance in a PC format
- Single and multi-channel capability with remote Pulser Preamps and Multiplexers
- High power pulser - exceptional S/N ratio
- Linear and logarithmic amplifiers in the same board

The PM30 is the culmination of over 15 years experience at USL in the design and manufacture of PC-based Pulser Receivers. Our designers have one thing in mind - to achieve top class performance with the convenience and flexibility of a PC board package.

With the exceptionally low noise characteristics, high gain and signal/noise ratio and wide dynamic range the PM30 can be applied in the most demanding situations. In production environments, the noise immunity and high PRF makes it ideally suited to in-line testing systems.

The logarithmic detector in the PM30 provides an exceptionally wide instantaneous dynamic range at a single gain setting - ideal for inspection of aerospace composites and capture of both high level and low level signals in a single scan.

The boards incorporate sophisticated pulse control and amplifier filtering, so that the characteristics can be matched to suit virtually any probe.

The PM30 is used in conjunction with a small (125 x 80 x 58mm) remote Pulser Preamplifier (PPA15) or the USL Multiplexer (MUX8), providing up to 32 channels in pulse echo and through transmission operation. Connection to the remote units - up to 300 metres distant - is made with a custom umbilical cable. This provides exceptional noise immunity, whilst allowing full remote software control of all the parameters.

The communication bus built into these boards enables the parameters in the main Pulser Receiver board to be switched at full PRF rates, up to 20kHz. This is ideal for situations where multi channel systems use different probe frequencies or different gains, for example.

The PM30 occupies a single full length PC slot. A further slot is required for a communication controller board. For single channel applications with a PPA15, this also incorporates an HT power supply module. A range of high speed data acquisition boards is also available from USL.

# PM30 Pulser Receiver Specification

INPUTS/OUTPUTS	
PPA/MUX	“D” type connector on end bracket for connection to PPA15 or USL Multiplexer
Outputs	3 outputs selectable as RF, rectified, log or external input signal—selectable on each timeslot. 1 output - TVG/DAC ramp 1 output - delay and width (jumper selected) 1 output - secondary amplifier
Trigger	Internal or external
Data	All settings can be read back
PULSER	
Pulse voltage	0-400 volts into 50 ohms
Pulse rise time	<10 nanosecs (10%-90%)
Pulse fall time	<10 nanosecs (10-90%)
Pulse shape	Square wave (spike pulse at lowest setting of pulse width)
Pulse width	10-250 nanosecs, measured at 50% amplitude points
Pulse control	Width software controlled in 256 steps Voltage software controlled in 5V steps
PRF	20kHz maximum
PREAMPLIFIER	
Bandwidth	<0.5 - 45MHz (-3dB)
Gain	20dB maximum
Input attenuation	0, 20 dB
Gain/atten'n steps	10dB
Mode	Pitch catch and pulse echo
Damping	33, 50, 100, 200 ohms
RECEIVER	
Gain	100dB (linear), 20dB (log)
Accuracy	+/- 0.2dB
Gain adjustment	<b>Main amplifier</b> (linear amp) 0.1dB steps <b>Log detector</b> (log amp) 0, 10, 20dB plus 0 - 10dB in 0.1dB steps
Switched gain	120dB (linear), 40dB (log)
Bandwidth	Linear 0.5-30MHz (-3dB), Log 0.5-15MHz (-3dB)
Dynamic range	Instantaneous dynamic range of 90dB+ in <b>log mode</b>
RF Filters, band pass	Selectable pre-rectification / pre-detection filters having adjustable bandwidth and centre frequency
Filter bandwidth 10 ranges	0.5 - 2MHz, Narrow and Wide 1 - 4MHz, Narrow and Wide 2 - 8MHz, Narrow and Wide 4 - 15MHz, Narrow and Wide 8 - 32MHz, Narrow and Wide
Frequency offset	Centre frequency of filter can be adjusted within each bandwidth range in 60 discrete steps, giving a total of 600 band pass filter settings
Filters, low pass	4 selectable pre-rectifier/detection filters 15, 10, 5, 3.5MHz (-3dB)

RECEIVER (Cont)	
Rectifier	Full wave, +ve half wave, -ve half wave
Filters - post rectifier	Selectable - 240 settings (Slope range 5 to 255)
Filter frequency	32, 10, 3, 1, 0.8MHz
Log filters	Post detection filters - 6 ranges 500kHz to 15MHz
O/P impedance	50 ohms
Output voltage	+/- 4 volts (unterminated)
O/P sensitivity	Log output 1volt/20dB
Trigger	Internal or external External trigger TTL, active low, minimum low period 10usecs, minimum high period 40usecs
TVG/DAC	
Min/Max period	100 nanosecs to 10 milliseconds
Clockrate	10MHz to 100kHz (7 options)
No of points	Selectable, 1 to 1000
Range	64, 128, 256, 1024 microseconds
Gain range	60dB in 0.1dB steps
Slope	Recommended maximum 20dB/microsec. (60dB/100 nanosecs is possible)
TVG/DAC control	On/Off Trigger from PRF or interface echo, +ve or -ve Trigger threshold programmable I/F trigger blanking, 0—6.55msecs in 100nsec steps TVG/DAC delay trigger
SECONDARY AMPLIFIER	
Function	Separate programmable output, for example used for backwall monitoring.
Gain range	0 - 45dB in 0.2dB steps
Filter	10MHz or wideband
SELF CHECK	
Function	The Pulser Preamplifier can be programmed to inject a sine wave, for the purpose of automated self testing or calibration.
Frequency range	400kHz to 20MHz in 5kHz steps
Input amplitude	22µvolt P-P to 1 volt P-P
MULTIPLEXING	
Capability	32 physical channels in modules of 8. Physical channels are programmable on a timeslot basis (One physical channel can be programmed with different settings in each timeslot at 20kHz).
LONG CABLE COMPENSATION	
Function	Compensation for 50 metre long umbilical cables to maintain frequency response.

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