

Time FireWall™

Protecting Critical Infrastructure in a GNSS Denied & Spoofed Environment

Key Attributes of the TimeFireWall™

- ✓ Ensures Accurate Time during a GNSS Jamming or Spoofing attack
- ✓ Easy to install without disruption to existing legacy equipment
- ✓ Sends an alarm upon detection of an attack
- ✓ 19" Rack Mounted Solution
- ✓ Winner of the 2016 Quality Innovation Award
- ✓ Patented Solution (Patent no: 235356)



In our modern world, more and more devices and systems as well as critical infrastructure and networks rely on GPS or on other GNSS (Global Navigation Satellite Systems) for navigation and for providing accurate timing and synchronization. Precise time, frequency and phase are all key elements in critical sectors such as Power and Utility Companies, Financial and Banking markets, Mobile and Computer Networks, to name just a few examples. According to a recent report from the US Department of Homeland Security; **“15 out of the 19 Critical Infrastructure & Key Resources Sectors have some degree of GPS timing usage”**.

It is a well-known fact that satellite signals coming from the GNSS units in space are precariously weak and these signals can easily be **blocked, jammed or spoofed** (delivering bogus signals to the GNSS receiver) intentionally or unintentionally. Such attacks are recognized as posing a serious threat to many critical infrastructure applications which currently rely heavily on the publicly available GPS signal. A group of researchers recently demonstrated how a relatively simple spoofer can cripple an entire power network causing electrical outages to millions of subscribers within minutes. Similarly the financial and business world is totally dependent on accurate time-stamping for all transactions carried out and disruptions to the timing networks in a financial institution could mean the difference between gaining or losing millions of dollars.

AccuBeat - a leading developer and producer of Rubidium based Atomic clocks – is proud to introduce the **unique and patented Time FireWall™ (TFW™)** which when inserted into a timing network provides *security and backup* of the accurate time obtained from a GNSS receiver. AccuBeat’s patented Time FireWall™ is a box that is inserted between the antenna and the existing GNSS receiver. The TFW™ receives the GNSS satellite signal from an antenna, checks the integrity of the signal using an internal atomic clock and various techniques and when it determines that the GNSS signal is reliable it passes an RF signal on to the timing network with “a seal of integrity”. If the Time FireWall™ determines that the GNSS signal is unreliable (either due to blocking or jamming or spoofing or any other malicious attacking), the TFW™ sends out a warning alarm and uses its internal satellite signal simulator and Rubidium Atomic Clock to provide an alternate GNSS signal to the customers receiver, allowing continuous and uninterrupted operation of timing and synchronization **even in a GNSS denied or spoofed environment**.



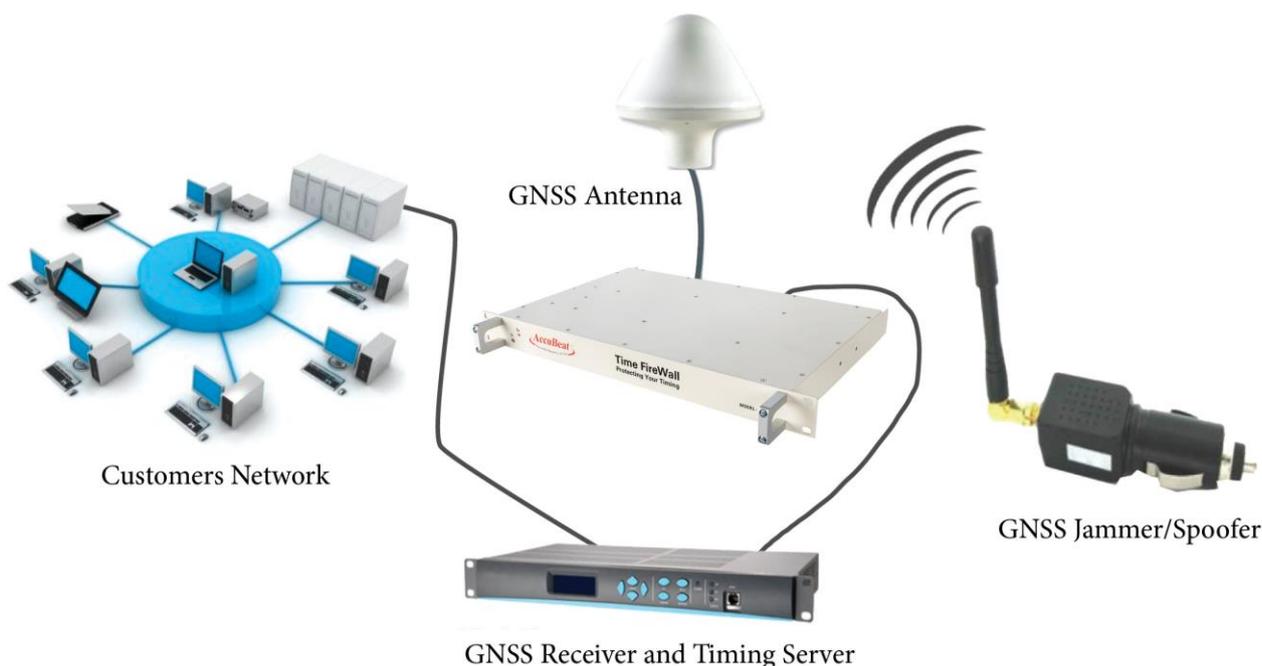
STOCK	BID	OFFER	LAST	VOL	STOCK	BID	OFFER	LAST	VOL
PLANET PIT	0.000	0.000	0.000	0	PRAIRIE	0.280	0.400	0.400	32T
PLANETBAS	0.019	0.021	0.000	0	PRANA	0.250	0.255	0.250	45T
PLAT AJST	0.000	0.000	0.000	0	PREC METAL	0.000	0.290	0.000	0
PLAT MGMT	0.540	0.550	0.540	9HT	PREDICTIVE	0.010	0.000	0	0
PLATINA	0.085	0.080	0.080	4HT	PREM INV	9.330	9.320	4HT	0
PLATINUM	1.850	1.855	1.850	2HT	PRIMA	0.041	0.042	7HT	0
PLATYPUS	0.001	0.002	0.001	33M	PRIMARY	4.760	4.760	1M	0
PLD CORPDR	0.008	0.010	0.008	36M	PRIMARY SOL	0.050	0.040	40T	0
PLINTEX	0.000	0.000	0.000	0	PRIMARY GEN	0.065	0.000	0	0
PLUMAX	0.080	0.080	0.080	52T	PRIME CREDIT	0.000	0.000	0	0
PLUTON	0.000	0.000	0.000	0	PRIME FIN	0.115	0.115	1HT	0
PMASIAN	0.930	0.945	0.945	15T	PRIME MP	0.118	0.115	8HT	0
PMGLOBAL	0.955	0.940	0.935	1HT	PRP	0.25	0.25	1M	0
PMPT LTD	0.485	0.485	0.485	1M	PR	0.10	0.10	0	0
PNLAX	0.415	0.420	0.420	1HT	PR	0.10	0.10	0	0
PO VALLEY	0.080	0.087	0.000	0	PR	0.10	0.10	0	0
POSEIDON	0.210	0.215	0.210	11M	PR	0.10	0.10	0	0
POTASH WEB	0.040	0.042	0.040	1HT	PR	0.10	0.10	0	0
POTINI	0.070	0.072	0.071	8HT	PR	0.10	0.10	0	0
POWERPES	0.010	0.029	0.000	0	PR	0.10	0.10	0	0
PRK GROUP	0.720	0.880	0.000	0	PR	0.10	0.10	0	0
PRK GROUP	0.350	0.880	0.000	0	PR	0.10	0.10	0	0
POWERSEZ	0.010	0.058	0.000	0	PR	0.10	0.10	0	0
PRM	0.010	0.015	0.015	8HT	PR	0.10	0.10	0	0
PRM	0.010	0.015	0.015	8HT	PR	0.10	0.10	0	0
PRM	0.010	0.015	0.015	8HT	PR	0.10	0.10	0	0



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The following picture shows how AccuBeat's patented Time FireWall™ (TFW™) is easily and seamlessly installed into the customer's legacy timing equipment. As can be seen the TFW™ is designed to be placed between the GPS/GNSS antenna and the users GPS/GNSS Receiver & Timing System. This enables the equipment to be easily deployed in any timing network or application that requires an input RF signal from a GNSS receiver and is therefore not limited to timing equipment provided by AccuBeat. In fact the TFW™ can be easily inserted into any timing network and is independent of the manufacturer of the timing solution already installed at the customer's site such as a power utility company, banking institute or other critical infrastructure. No changes are required in the legacy equipment already installed except for some very minimal changes in cabling.



Key Technical Features of the Time FireWall™

- ✓ Holdover (Rb clock configuration): 1µs/24 hrs (typ.)
- ✓ Input: GPS L1 antenna
- ✓ Output: GPS L1 signals
- ✓ Monitor & Control: RS232
- ✓ Power supply: 110 / 220 V AC
- ✓ 19" 1U Rack Mounted



Time FireWall™ is Patent Protected (Patent no: 235356)