



## Description

IPICO's Dual Frequency RFID Technology uses the same IP-X multi-read protocol as its UHF products, but the low frequencies used, (125kHz power-up and 6.8MHz return signal), can penetrate through "lossy" media without the problems of tag antenna detuning, and the high signal attenuation encountered with UHF systems. Because of the high tag transmit carrier frequency, high data rates are achievable (up to 256kbit/sec), resulting in fast reading of multiple tags in the beam. Dual Frequency technology allows for longer ranges to be achieved than single frequency low frequency technologies, e.g. 125 kHz or 13.56 MHz. This is mainly because the tag data carrier frequency (6.8 MHz) is much higher than the power-up frequency (125 kHz). The DF Ferrite tag inlet consists of a chip module connected to transmit and power-up coils on a ferrite core, operating at 6.8 MHz and 125 kHz respectively. Because the coils' magnetic fields are mostly contained within the ferrite core, their inductance is largely independent of nearby conductive and magnetic materials, which can seriously detune air-cored coils, resulting in loss of reading range. For this reason the Ferrite tag inlet can operate when in close proximity to metal surfaces & objects. It requires secondary packaging (as in the DF Small Industrial Metal Mount tag), or can be embedded in other materials, e.g. concrete or wood.

**Caution: The inlet requires the protection of secondary packaging, or embedding into materials or objects.**

### Applications

- § Short range applications, e.g. access control and asset control
- § Tracking of instruments
- § Tracking of mine Self Contained Self Rescue packs
- § Tracking of foodstuffs, in bins or bags
- § Mining tracers (ore, diamonds)
- § Electronic labelling of RF-unfriendly materials (rock samples, trees, etc)
- § Any situation where the tag needs to be embedded in, or affixed to a lossy material.

### Chipset

- § X3 / EM4322

### Inlet Construction

- § The inlet consists of a Teflon™ tube of size 33.5 (+2, -0) mm (L) x 4.26 mm (OD) housing a chip module attached to 125 kHz and 6.8 MHz coil antennas on a ferrite core, potted.

## Key Features

- § Low cost single chip solution
- § Compliant with USA, European, Australian, and RSA spectrum allocations
- § Dual frequency (Transmit 125kHz / Receive 6.8MHz)
- § Robust Anti-collision protocol (up to 120 tags read simultaneously)
- § Fast moving tags (4 m/sec) can reliably be read
- § Can be used in mixed populations of Read/Write and Read-Only Dual Frequency IP-X RFID tags
- § Factory programmed 64 bit ID number
- § High tag transmission rate (128 kbits/sec)
- § High tag read rate – up to 155 tags/sec
- § Passive – no battery
- § -30 to +70 °C operating temperature range
- § Can be secondary packaged or embedded
- § Waterproof
- § Can be mounted near metal surface



DF Tag Ferrite Inlet 35 x 4.0 mm diam, suitable for mounting on metal surfaces



NOTE: Orientation sensitivity for Magnetic fields. User must familiarise themselves with the tag and reader interface before implementation.

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## Specifications

Device Name	X3 DF tag, Ferrite Inlet	
Part Number	IP-X X3-V39-Fer-35x4-INL	
Power requirements	Passive No batteries (inductive coupling at 125 kHz, which is received and rectified to generate a supply voltage for the chip)	
Read Range	Depending on tag/reader orientation, but typically 400-600mm in best orientation to a 'master' conference reader setup.	
Data rate	128 kbit/s	
Moving Tags, readability	10 tags @ 5m/sec; 35 tags @ 2 m/sec; Depends on the complete read scenario	Simulated
Multi-Read rate	20 tags in beam: 90 tags/sec; 100 tags in beam, 55 tags/sec	
Protocol Saturation	Time to read 20 tags = 0.2 sec; time to read 100 tags = 1.8 sec	
ID Length	64 bits (16 bit CRC)	
Antenna	Ferrite core coils (125 kHz and 6.8MHz)	
Programmability	Read-only, factory programmed ID, 64 bits	
Physical	Dimensions = 33.5 (+2, -0) mm (L) x 4.26 mm (OD) Weight = 1.5 g Housing material = Teflon™	
Environmental	Operating temperature range: -30 to +70C Storage temperature range: -40 to +85C Humidity: up to 100% IP rating: IP 68	

## Ordering Information

Product Name	Product Code	Description
X3 DF tag, Ferrite Inlet	IP3418	IP-X X3-V39-Fer-35x4-INL