

The Problem of “Tag Clutter”

What is Tag Clutter

Why Is It a Problem

What Can You Do Today

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Agenda

- **Personal Introduction**
- **Tag Clutter Defined**
- **Why Is Tag Clutter a Problem?**
- **What Can You Do Today?**
- **On to Megan... What Is the RAIN Alliance Doing about It?**



Personal Introduction



Chris Brown

RFID Subject Matter Expert

- 25 years in the Auto ID industry
- Joined TSC Printronix Auto ID in 2018
- Focused on RFID market and technologies
- Active member of RAIN RFID Alliance
- Active member of AIM

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Tag Clutter Defined

Tag Clutter, aka “Tag Pollution”

- **RAIN Flooding:** Too many tags in a read-zone at one time for the reader to process. Readers need time!
- **Acid RAIN:** Tags from another application being erroneously processed by your application



Why is Tag Clutter a Problem?

Let's start with the answer:

- So readers can quickly and efficiently “filter” for tags of interest and disregard tags from other applications

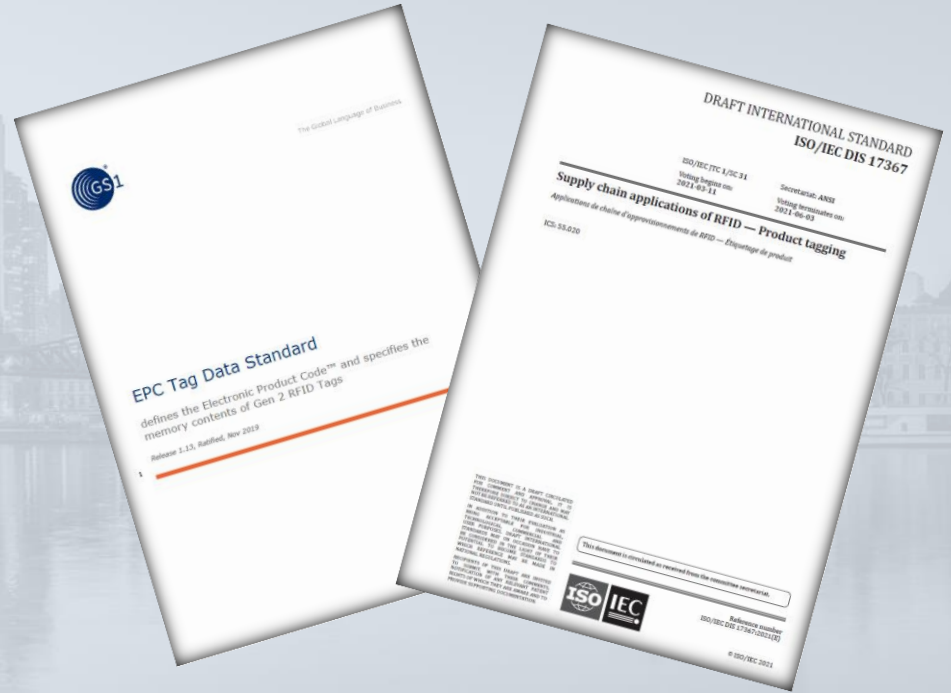
And the problem:

- People encoding tags with “any serial number schema that suits me”
- **21 billion tag chips sold in 2020**
 - Growing every year
 - Generally cumulative
 - 1 trillion tags by 2030?
- **Tags Clutter is starting to happen**
 - Others' tags cluttering my application
 - My tags cluttering other people's applications



What Can You Do Today?

- Encode according to a “numbering system” standard:
 - GS1 “Tag Data Standard”
 - Various ISO/IEC standards available
- (Use a reader that filters/reads tags correctly – separate presentation)

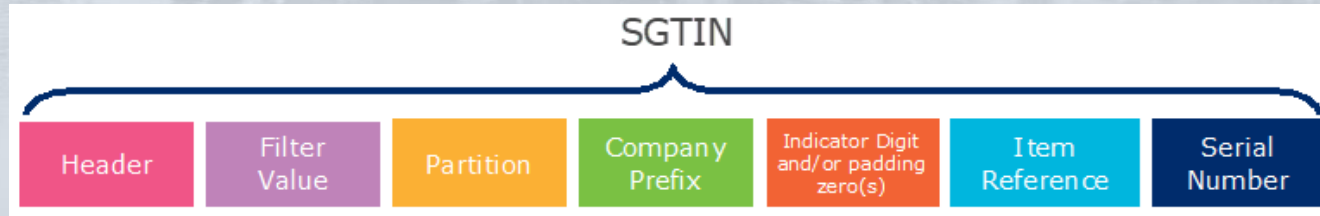


What Can You Do Today?

By using a standardized numbering system, your tags can be targeted (filtered) quickly and efficiently by readers (no Tag Clutter)

- Ultimately, you are setting multiple possible filter values
- **Example1:**
 - GS1 Tag Data Standard → T bit = 0
 - GS1 SGTIN-96 → Header = 30h
 - “Filter Value”
 - Etc.

T bit = 0
↓



What Can You Do Today?

Example 2:

- ISO/IEC DIS 17367 → T bit = 1
 - “Supply chain applications of RFID — Product tagging”
- Application Family Identifier (AFI): Describes application at high-level
 - “Monomorphic-UII using 6-bit compaction for ISO 17367 product tagging” → AFI = A1 (hex)
- Unique Item Identifier (UII) itself:
 - “Data Identifier(s):” What specific data follow?
 - ... Issuing Agency Code (IAC) + Company Identification Number (CIN) + company item info (serial number, etc.)... → DI = 25S
 - IAC = QC
 - CIN = T110
 - Serial number = 410003511



(Source: TRUMPF Maschinen AG, CH-6341 Baar)

MB01 PC Word					MB01 UII
UII len	UM	XI	T	AFI	Industrial barcode message
00111	-	-	1	0xA1	"25SQCT110410003511"



What Can You Do Today?

Stay tuned to hear Megan Brewster from Impinj talk about what the RAIN Alliance is doing to address the problem...



RAIN Alliance Actions to Promote Encoding Best Practices



Megan Brewster
Chair, Application Identity Workgroup
VP Advanced Technology, Impinj



Commit to Encoding Best Practices

- Improper tag encoding and vendor-defined numbering systems are resulting in tag clutter
- Today, the RAIN Alliance is calling on members & partners to make public commitments to promote encoding best practices
 - Apply for a Company Identification Number (CIN)
 - Promote encoding educational materials
 - Make proper encoding automatic and easy
- Contact tagclutter@rainrfid.org to learn more



Proper Encoding Reduces Tag Clutter

- **More than 21 Billion RAIN tag chips were sold in 2020**
- **Tag clutter is growing**
 - Tag clutter = user is unable to filter “my tags for my application” from other’s tags/other applications
 - An estimated 30-70% of today’s tags do not use standards-based numbering systems, which have pre-defined fields for filtering
 - Due to lack of awareness, encoding complexity
 - These deployments are both large and small (which can grow to be large)
- **RAIN Alliance and its members can help by promoting encoding best practices, including a new easy-to-use ISO numbering system**
- **Enables the success of all RAIN RFID deployments**



Commit to Encoding Best Practices

RAIN Alliance Members & Partners are asked to make a public commitment to reducing tag clutter:

- Apply to RAIN Alliance for a Company Identification Number (CIN)
- Promote encoding educational materials
- Make proper encoding automatic and easy

Commitments will be published together in 1H2022

Make your commitment at <<LINK>> or email tagclutter@rainrfid.org to discuss your company's commitment!



How to choose numbering system

RAIN Alliance is the first point of contact for new users seeking to encode their tags.

Intake

- RAIN Alliance collects basic information about intended use case (open/closed-loop, industry, tag volume, etc.)
- RAIN Alliance webpage encourages User to leverage existing standard numbering systems...

GS1

- User directed to GS1 (<https://www.gs1.org/contact/overview>) to identify numbering systems fitting their use case
- If GS1 services/numbering systems do not meet their needs, then proceed to ISO...

ISO

- User directed to ISO Issuing Agency Companies (IACs) to identify numbering systems fitting their use case
- If ISO numbering systems do not meet their needs, then User returns to RAIN Alliance...

RAIN ISO

- User uses the RAIN Alliance ISO numbering system



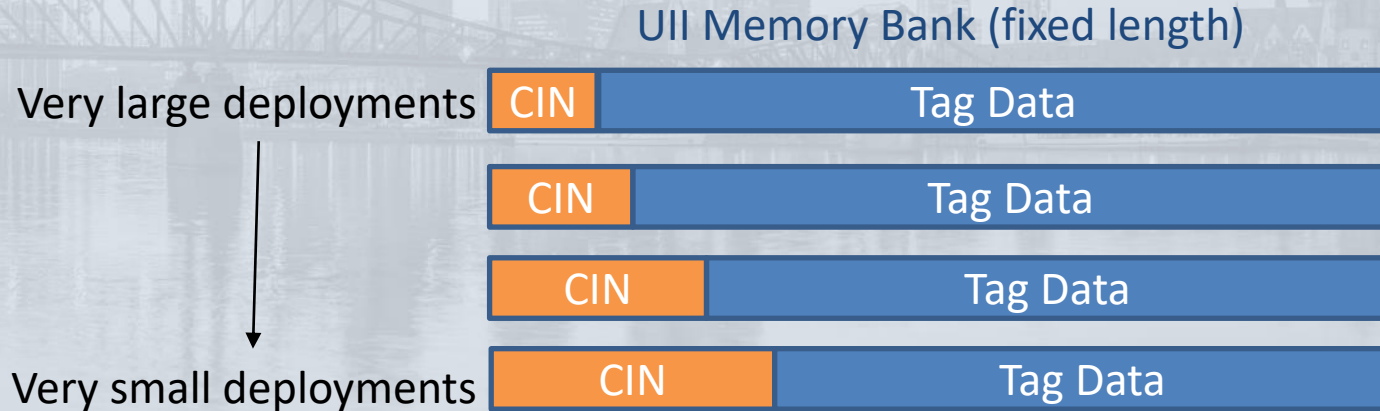
RAIN Alliance ISO Numbering System

Memory Bank 01	Protocol Control (PC) word				Unique Item Identifier (UII)	
Description	UII Length	Indicators	Toggle (T)	Application Family Identifier (AFI)	Company Identification Number (CIN)	Item information (serial number, etc.)
Value	Varies	Set by tag	"1" (binary)	"AE" (hex)	Varies	Defined by CIN owner
Length	5 bits	2 bits	1 bit	8 bits	8, 16, 24 or 32 bits (2, 4, 6, or 8 digits)	<i>n</i> bits to a word boundary



Apply for a Company Identifier (CIN)

- **Short (2 or 4 digit) CINs will conserve on-tag data**, but there will be few available, so they are reserved for those with large annual volumes of tags
- **Longer (6 or 8 digits) CINs will be readily available** for smaller deployments



Commit to Encoding Best Practices

Together, we can reduce tag clutter for the success of all RAIN deployments:

1. Consider what your company can do to promote encoding best practices
2. Make your commitment at rainrfid.org or email tagclutter@rainrfid.org
3. Ask your partners to participate in making a commitment





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