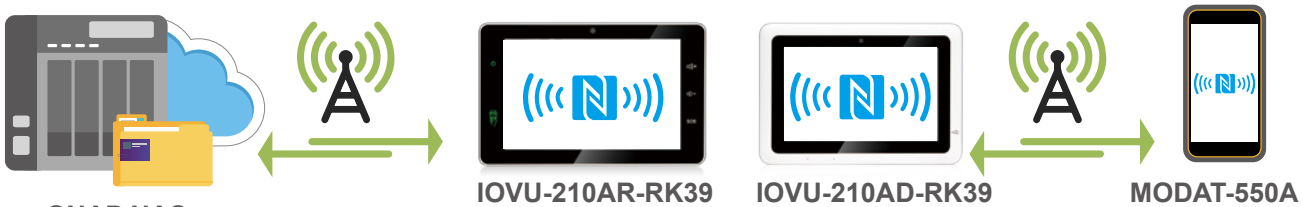
Automatic Identification and Data Capture (AIDC) Technology

Near Field Communication (NFC) Technology



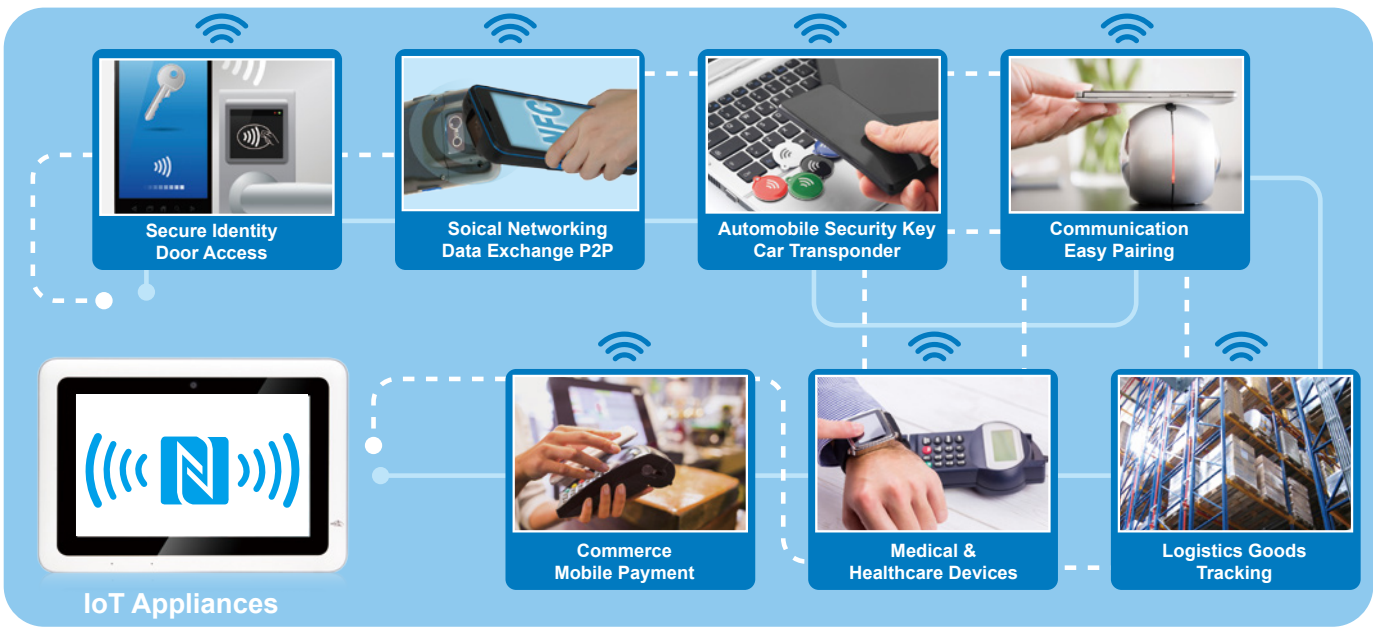
■ Comparison of Short-range Communication Technologies

Technology	Standard	Frequency	Range	Data Rate
RFID	ISO 10536	13.56 MHz	0~2 mm	9.6 Kbps
	ISO 14443	13.56 MHz	0~10 cm	106, 212, 424 Kbps
	ISO 15693	13.56 MHz	0~70 cm	26 Kpbs
NFC	ECMA-340, 352, 356, ISO/IEC 18092, 2148, 1ETSI TS 102 190	13.56 MHz	0~20 cm	106, 212, 424 Kbps
Infrared	IrFM	405 THz-300 GHz	20 cm~30 cm low power to 1 m~2 m	9.6 Kbps~4 Mbps
Bluetooth	Bluetooth V4.0	2.4 GHz	10 m-100 m	720 Kbps

- NFC, as an open platform technology, is standardized in the NFC Forum, which was found by Philips (MIFARE®), Sony (FeliCa™), Samsung and Nokia.
- NFC is based on and the extension of RFID. It operates on 13.56 MHz frequency and is compatible with today's field proven contactless MIFARE® and FeliCa™ smart cards
- NFC communication range is up to 10 cm.
- NFC standard supports different data transmission rates such as 106 kbps, 212 kbps, and 424 kbps.

■ Three NFC Application Families

The Near Field Communication (NFC) extends the RFID technology, and utilizes the 13.56MHz frequency to communicate and exchange data between devices which are in close proximity (less than 10cm) to each other. Popular applications include payment, gaming, and social networking (e.g. mobile gaming and device-to-device communication).



Radio Frequency Identification (RFID)

The RFID technology uses radio frequency as a data transmission intermediary. It can be classified by the frequency band the RFID system adopts since different frequencies will result in different physical attributes.

Frequency band	Operating range*	Applications	Benefits	Drawbacks
LF, < 135KHz	< 0.5m	• Access control • Product authentication • Animal tracking	Works well around water and metal	• Short read range • Slower read rate
HF, 13.56MHz	< 1m	• Smart cards • Airline baggage • Library books	Low cost	Higher read rate than LF
UHF 860MHZ to 930MHz	< 4m	• Pallet tracking • Parking lot access • Carton tracking	EPC standard built around this frequency	Does not work with items of high water or metal content
Microwave 2.4GHZ	< 1m	• Airline baggage • Electronic toll collection	Most expensive	Fastest read rates

* The operating range depends on reader power and operating environment

■ HF RFID and NFC Supported Models




	AFOKAR-08A	IOVU-210AD-RK39	IOVU-210AR-RK39	MODAT-550A
Size	8”	10.1”	10.1”	5.5”
Protocols supported	•Supports ISO/IEC 14443A Reader/Writer mode up to 848 kbit/s •Supports ISO/IEC 14443B Reader/Writer mode up to 848 kbit/s •Supports contactless communication according to the FeliCa™ protocol at 212 kbit/s and 424 kbit/s •Supports MIFARE® encryption •Typical operating distance in Read/Write mode for communication to ISO/IEC 14443A/MIFARE®, ISO/IEC 14443B cards up to 50 mm depending on antenna size and tuning			•Reader Features (106k-848Kbits/s) -Support ISO 15693-Support ISO14443A -Support NFC Forum Type 1-4 Tag •Card Emulation Mode (106K-848Kbits/s) (optional) -Support ISO 14443A -Support NFC Forum Type 1-4 Tag -Support MIFARE® via CLT •Near Field Communication (106K-424Kbits/s) -Peer to Peer Active/Passive mode -ISO 18092 compliant


	AFL2-xxxA Series	POC-W22A-H81
Size	7” ~ 22”	22”
Protocols supported	•ISO14443A/B 106kbps/212 kbps/424 kbps/848 kbps •ISO15693	•ISO/IEC 14443A/MIFARE® Reader/Writer •FeliCa™ Reader/Writer •ISO/IEC 14443B Reader/Writer •ISO/IEC 14443A/MIFARE® Card MIFARE® 1 KB or MIFARE® 4 KB emulation •FeliCa™ Card emulation •ISO/IEC 18092, ECMA 340 Peer-to-Peer

1D/2D Barcode Capability

■ Mobile Barcode Reading

The embedded Honeywell or Motorola scan engine, which is a decoded miniature area imaging scan engine designed to scan 1D and 2D barcodes, features a megapixel imaging sensor, a wide angle lens design, the integration of illumination and aiming function, and an industrial leading decoding software to deliver fast and aggressive scanning performance.

- Accurately decodes all 1D and 2D codes, even wrinkled, damaged or poorly printed
- Large scanning area
- Fast scan rate


Technology	1D Barcode	2D Barcode
Reading Condition	20 to 25 characters	100 to about 2,000 characters
Symbologies	EAN/UPC, RSS, Code 39, Code 128, UCC/EAN 128, ISBN, ISBT, Interleaved, Matrix, Industrial and Standard 2 of 5, Codabar, Code 93/93i, Code 11, MSI, Plessey, Telepen, postal codes.	Data Matrix, PDF417, Micro PDF 417, Maxicode, QR, Aztec, EAN.UCC composite