

교육 콘텐츠

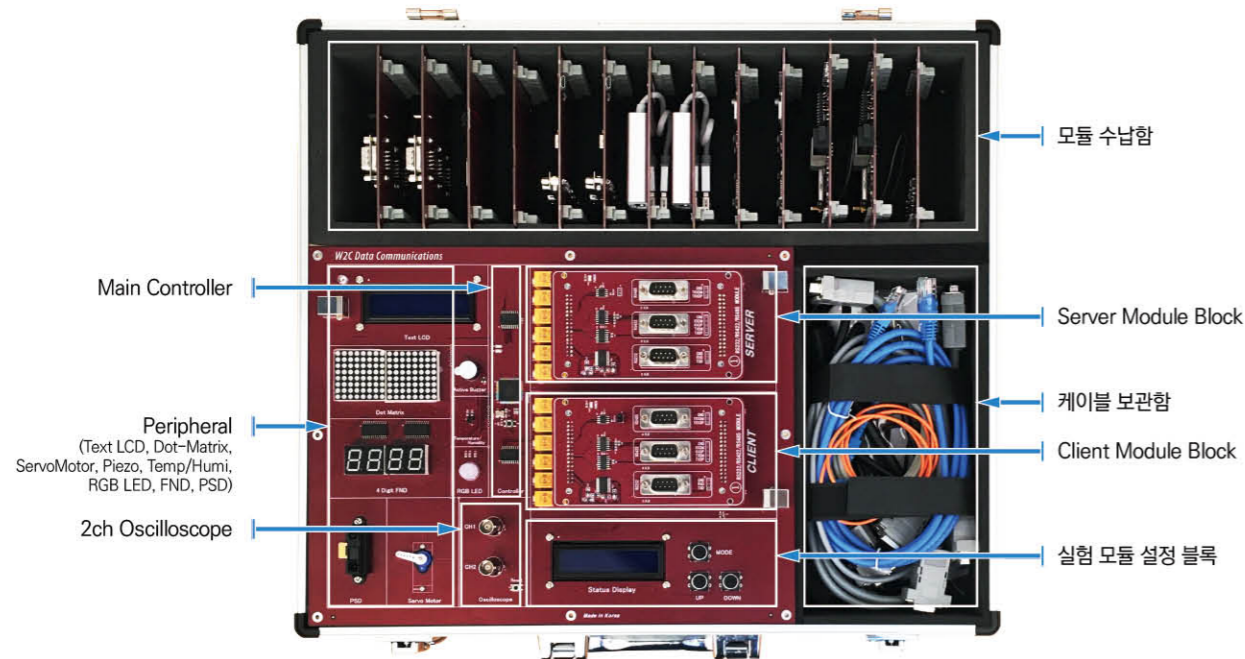
유선통신

- RS232
- RS422
- RS485
- USB
- CAN
- Ethernet
- Optical

무선통신

- IrDA
- RF433
- Wi-Fi
- Bluetooth
- ZigBee
- LoRA
- NFC

레이아웃



제품 구성품



W2C Data Communications



AC Power Cable 1EA



NFC Card 1EA



Ethernet Cable 1EA



Serial Cable 3EA



USB A-B Cable 2EA



Oscilloscope Probe 2EA



USB Memory 1EA

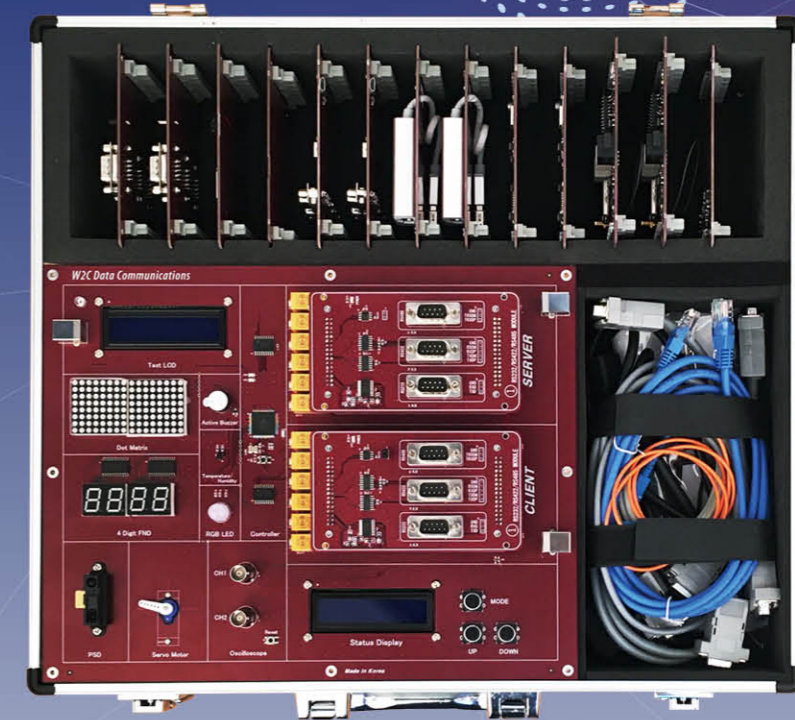


User Guide book 1EA

W2C

유 · 무선 통신 실습장비

Data Communications



- 유선통신 7종, 무선통신 7종의 통신 제어 기술을 서버-클라이언트 구조로 학습하는 유무선 통신 시스템 실습 장비
- 통신 실험의 흥미를 유발하기 위해 조도, 온/습도 센서 등 주변장치 제어와 연계
- 통신 데이터를 직관적으로 분석할 수 있도록 오실로스코프 지원
- 가장 기본적인 시리얼 통신 인터페이스인 RS232, RS422, RS485 통신 실험 지원
- 고속 시리얼 통신 인터페이스인 USB, CAN, Ethernet 통신 실험 지원
- 근거리 무선 통신 인터페이스인 13.56MHz 대역의 NFC 통신 실험 지원
- 433MHz 주파수 대역의 RF 통신용 실험 지원
- 근거리 저전력 무선통신 인터페이스인 ZigBee, LoRa, Bluetooth 통신 실험 지원
- 근거리 무선통신 인터페이스인 Wi-Fi 기반 P2P 통신 실험 지원
- 가전 제어 통신 인터페이스인 IrDA 통신 실험 지원
- 광섬유 기반 통신 인터페이스인 Optical 통신 실험 지원

W2C

Data Communications



소프트웨어 사양

LIST	Specification
Controller Dashboard with Server-Client Mode Monitoring	Basic Peripheral RS232 Data Block, RS422 Data Block, RS485 Data Block, IrDA Data Block, RF433 Data Block, Wi-Fi Data Block, Ethernet Data Block, ZigBee Data Block, LoRa Data Block, Bluetooth Data Block, USB Data Block, CAN Data Block, NFC Data Block, Optical Data Block
Oscilloscope software	Frequency, Voltage, Cursor Settings Measurements

하드웨어 사양

LIST	Specification
Size	Base : 314 X 246, Module : 121 X 70
Text LCD	Display : 2 Lines 16 Interface : I ² C
DOT MATRIX 2EA	Size : 1.8inch, 8x8 Interface : 3 wire Serial Interface
SEVEN SEGMENT (2Digits x 2EA)	Size : 1.2inch Type : Common Anode Interface : I ² C
RGB LED	Size : 10pi Wavelength : RED(630 nm), GREEN(525 nm), BLUE(430 nm) Interface : GPIO
SERVO MOTOR	working speed : 0.12sec/60 (4.8V no load) Interface : I ² C
TEMPERATURE	Accuracy : ± 4°C Resolution : 14bit(0.01C), 12bit(0.04C) Interface : I ² C
HUMIDITY	Resolution : 12bit(0.04%RH), 8bit(0.7%RH) Accuracy : ± 3%RH Interface : I ² C
BUZZER	Sound Output at 10cm(dB) : Min85dB Interface : GPIO
Light Sensor	Illuminance Value : 0.1 ~ 40,000(Lux) Interface : Analog to I ² C
Distance Measuring Sensor	Detecting distance : 2~40cm Interface : Analog to I ² C
Status Display	Display : 2 Lines 16 Text Interface : I ² C
Module Select Switch	Tact Switch 3EA Interface : GPIO
Oscilloscope	Using PC Software (USB Cable connected), View : AC / DC Control Sampling Speed : 20kHz ~ 60MHz 1ch 14 step/ 2ch 11 step, 1ch up to 60Msps(2ch up to 30Msps) Voltage Range : +25V ~ -25V Voltage Division : 0.02V ~ 5V / 8 step, Impedance : 1MΩ, Capacitance : 20pF Measure : Frequency, Vmax, Vmin, Vp-p, Vmean, Cursor Measurements

LIST	Specification						
Power	Input : AC 220V Output : 5V/3A						
RS232/RS422/485 Module 2EA	<table border="1"> <tr> <td>RS232</td> <td>500Kbps Data Rate Under Load Operation mode : Single Ended Speed : 115200bps(max) Voltage level : -25V ~ +25V(max voltage)</td> </tr> <tr> <td>RS422</td> <td>4-wire standard EIA RS422 communication Operation mode : Full-duplex differential Transceiver/Receiver Speed : 115200bps(max) Voltage level : -6V ~ +6V(max voltage)</td> </tr> <tr> <td>RS485</td> <td>2-wire standard EIA RS485 communication Operation mode : Half-duplex differential Transceiver/Receiver Speed : 115200bps(max) Voltage level : -6V ~ +6V(max voltage)</td> </tr> </table>	RS232	500Kbps Data Rate Under Load Operation mode : Single Ended Speed : 115200bps(max) Voltage level : -25V ~ +25V(max voltage)	RS422	4-wire standard EIA RS422 communication Operation mode : Full-duplex differential Transceiver/Receiver Speed : 115200bps(max) Voltage level : -6V ~ +6V(max voltage)	RS485	2-wire standard EIA RS485 communication Operation mode : Half-duplex differential Transceiver/Receiver Speed : 115200bps(max) Voltage level : -6V ~ +6V(max voltage)
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IrDA/RF433 Module 2EA	<table border="1"> <tr> <td>IrDA Transmitter</td> <td>Output radiant intensity : ± 24° Emission Wavelength : 880 ~ 900(nm) Spectral bandwidth : 45nm</td> </tr> <tr> <td>IrDA Receiver</td> <td>Minimum irradiance in angular range : 0°~ 15°(20mW/m2) RXD pulse width : Input pulse length>1.2uS</td> </tr> <tr> <td>RF433</td> <td>RF data rate : 600 ~ 4800(bps) Used channel per frequency range 424MHz band: 21ch(max) 447MHz band: 25ch(max) Output Power : 10dBm(max) Rx sensitivity : -118dBm Antenna Impedance : 50Ohm</td> </tr> </table>	IrDA Transmitter	Output radiant intensity : ± 24° Emission Wavelength : 880 ~ 900(nm) Spectral bandwidth : 45nm	IrDA Receiver	Minimum irradiance in angular range : 0°~ 15°(20mW/m2) RXD pulse width : Input pulse length>1.2uS	RF433	RF data rate : 600 ~ 4800(bps) Used channel per frequency range 424MHz band: 21ch(max) 447MHz band: 25ch(max) Output Power : 10dBm(max) Rx sensitivity : -118dBm Antenna Impedance : 50Ohm
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Wi-Fi/Ethernet Module 2EA	<table border="1"> <tr> <td>Wi-Fi</td> <td>Protocol stack : TCP/IP Protocol stack Mode : station/softAP/softAP+station Security : WPA/WPA2 Encryption : WEP/TKIP/AES Deep sleep power <10uA wake up and transmit packet in <2ms Output Power : +20dBm (802.11b mode)</td> </tr> <tr> <td>Ethernet</td> <td>Interface : USB Connector : USB Type A, RJ-45 Speed : 1000Mbps</td> </tr> </table>	Wi-Fi	Protocol stack : TCP/IP Protocol stack Mode : station/softAP/softAP+station Security : WPA/WPA2 Encryption : WEP/TKIP/AES Deep sleep power <10uA wake up and transmit packet in <2ms Output Power : +20dBm (802.11b mode)	Ethernet	Interface : USB Connector : USB Type A, RJ-45 Speed : 1000Mbps		
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ZigBee/LoRa/Optical Module 2EA	<table border="1"> <tr> <td>ZigBee</td> <td>Indoor : up to 30m Outdoor line-of-sight : up to 100m Transmit Power : 1mW(0dBm) Receiver sensitivity : -92dBm RF Data Rate : 250,000bps Operating Frequency : ISM 2.4 GHz Supported Network Topologies : Point-to-point, Point-to-multipoint & Peer-to-peer</td> </tr> <tr> <td>LoRa</td> <td>Support IEEE802.15.4(e)MAC Support 6LoWPAN, IPv6, RPL, UDP, CoAP Frequency Band : 902 ~ 958MHz Data Rate : 0.3Kbps ~ 150kbps Output Power : 0dBm to 14dBm single-ended PA : MAX 20dBm</td> </tr> <tr> <td>Optical</td> <td>820nm wavelength technology Signal rates up to 160 MBd Optical jumper Code : 1EA</td> </tr> </table>	ZigBee	Indoor : up to 30m Outdoor line-of-sight : up to 100m Transmit Power : 1mW(0dBm) Receiver sensitivity : -92dBm RF Data Rate : 250,000bps Operating Frequency : ISM 2.4 GHz Supported Network Topologies : Point-to-point, Point-to-multipoint & Peer-to-peer	LoRa	Support IEEE802.15.4(e)MAC Support 6LoWPAN, IPv6, RPL, UDP, CoAP Frequency Band : 902 ~ 958MHz Data Rate : 0.3Kbps ~ 150kbps Output Power : 0dBm to 14dBm single-ended PA : MAX 20dBm	Optical	820nm wavelength technology Signal rates up to 160 MBd Optical jumper Code : 1EA
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Optical	820nm wavelength technology Signal rates up to 160 MBd Optical jumper Code : 1EA						
Bluetooth Module 2EA	Bluetooth version : V2.0+EDR Frequency : 2.4GHz Output power : +4dBm Sensitivity : -80dBm Speed : Asynchronous 2.1Mbps(max)/160 Kbps, Synchronous : 1Mbps/1Mbps Profiles : SPP						
USB/CAN Module 2EA	<table border="1"> <tr> <td>USB</td> <td>USB2.0 compliant full speed HID Interface Driver support : Windows10 32, 64bit. Windows7 32, 64bit. Windows XP Data transfer rate : 1.2k to 12Mbaud(RS232)</td> </tr> <tr> <td>CAN</td> <td>CAN V2.0B at 1Mb/s Compatible ISO 11898 standard Data rate : up to 1Mbaud</td> </tr> </table>	USB	USB2.0 compliant full speed HID Interface Driver support : Windows10 32, 64bit. Windows7 32, 64bit. Windows XP Data transfer rate : 1.2k to 12Mbaud(RS232)	CAN	CAN V2.0B at 1Mb/s Compatible ISO 11898 standard Data rate : up to 1Mbaud		
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NFC Module	ISO/IEC 14443A/MIFARE Reader/Writer Frequency : 13.56MHz Interface : UART 14443A Card 1EA						