

Protocol Converter for CNC Machine Tools FBR-100AN/FBR-100 OPC UA Activation Program

Supports Universal Communication Interface *umati* for Machine Tools



Outline

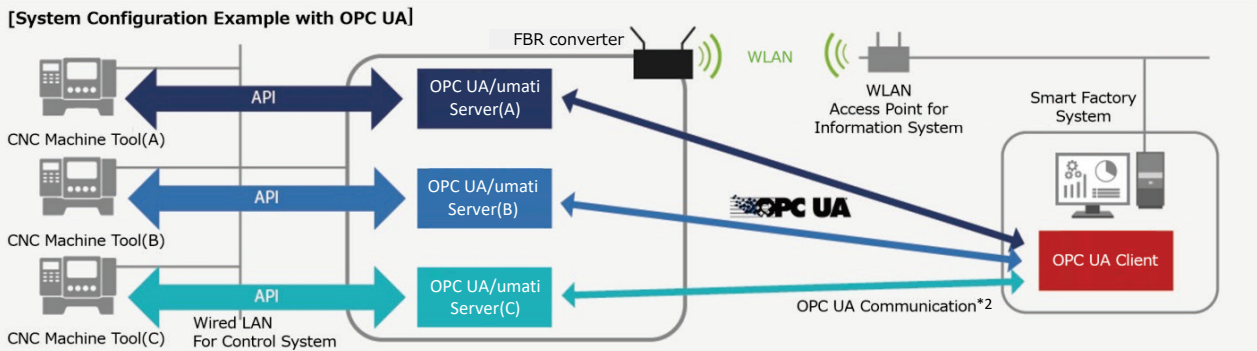
This is an optional program that enables FBR-100AN/FBR-100, a protocol converter for CNC devices, to support the Industry 4.0 platform *umati* (universal machine technology interface) for machine tools. Using this activation program, FBR converter can establish OPC UA communications for existing machine tools and provide IoT functions leveraging the universal data-exchange interface *umati**1 for machine tools. FBR converter and this new program allows factory users and machine tool makers to easily connect their machine tools directly to OPC UA-based systems and devices.

*1: Support OPC 40501-1 UA for Machine Tools ver.1.0 specification which specifies *umati* interface and its essential functions.
Plan to support OPC 40501-1 CTT test tool to be provided by the OPC Foundation in the future.

Features

● FBR-100AN/FBR-100 Simple Connection to CNC machine tools

The OPC UA function of the FBR converter can support up to 3 CNC machine tools. The OPC UA/*umati* client software in a host system of Smart Factory can collect the operation data of CNC machine tools when it accesses the OPC UA server running inside the FBR converter. The FBR converter is equipped with multiple wired LAN interfaces and wireless LAN communication functions to establish separated secure networks for the control/information systems in a factory.

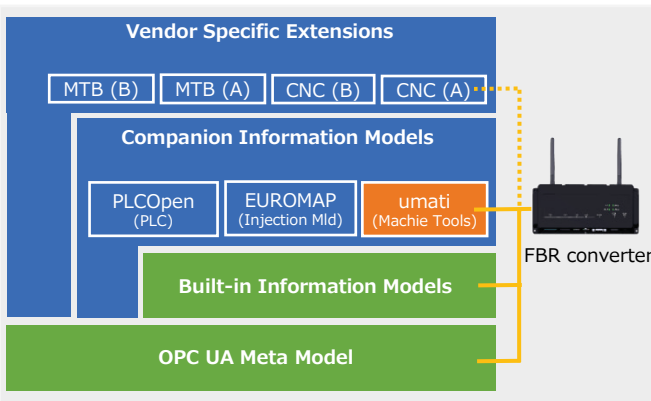


*2: To read out data of multiple CNC machine tools from an OPC UA client, specify the port number assigned to each OPC UA server operating inside FBR-100AN for communication.

● OPC UA Information Model supported by FBR converter

OPC UA specifications include companion-spec models defined for specific industries and makers' own information models. The FBR converter supports the information model *umati* for machine tools and FANUC CNC devices*3.

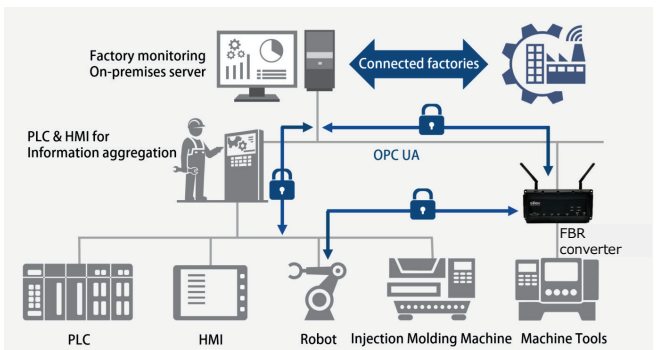
*3: For customization requests, please contact our sales representative.



● Advantage of FBR converter & OPC UA Communication

- Retrofittable OPC UA/*umati* communication function to existing machine tools
- Multi-vendor unified PC-to-Machine-to-Device communication
- Industry 4.0 standard making implementation simple for overseas (Europe, China, etc.)
- Protected read/write access to data by default*4

*4: The write function is not yet supported (as of March 2022). The write specification is not defined for *umati* ver.1.0.0 companion specifications.



Product Specifications

Model	FBR-100AN (Wireless LAN model)	FBR-100 (Wired LAN model)
Wired LAN Interface	RJ-45 x 2 ports (MAC address x 2) 10BASE-T/100BASE-TX/1000BASE-T (Auto-recognition)	
Wireless LAN Interface	IEEE 802.11a/b/g/n 2T x 2R	N/A
Device Interfaces	D-Sub9 male x 1 port (RS-232C/422A/485*1, configurable) Digital input: 3 bits (Input from external equipment such as a signal tower)	
Switch	PUSH switch x 1 (For factory reset) DIP switch: 4 bits (For device setting)	
LED	Two-color LED x 4	
Operating Environment	Temperature: -20 to +50°C *2 Humidity: 20 to 90%RH(No condensation)	
Storage Condition	Temperature: -20 to +55°C Humidity: 20 to 90%RH (No condensation)	
Power Supply	AC Adapter (sold separately) or DC 12 - 24V	
Power Consumption	24V/0.28A, 12V/0.54A	24V/0.15A, 12V/0.28A
Dimensions	230 x 105 x 36 mm (Excluding antennas)	
Weight	450g (Excluding antennas)	440g
Package Contents	Main unit, Standard pole antennas (only FBR-100AN), Warranty, Setup guide, Simplified Declaration of Conformity, GPL inquiry sheet	
Regulatory Compliance *3	[EMC] Japan: VCCI Class-A US: FCC Part15 Subpart B Class-A Canada: ICES-003 Issue 7 Class-A EU/UK: EN55032 Class-A, EN301489-1/-17(FBR-100AN) EN55035(FBR-100) [Radio cert] Certified in Japan, US, Canada, and EU/UK (only for FBR-100AN) [RoHS] Compliant with EU RoHS Directive	
System	CPU: NXP i.MX6 SoloX RAM: 256MB Embedded storage: eMMC 2 GB (Pseudo SLC: 1.2 GB available to the user)	
Enclosure	Plastic case	
Dust/Waterproof	Compliant with IP53 (with included protective caps and connectors for wall mounting)	
Shock Resistant	Sinusoidal:1.0G (XY direction) 10 to 500 Hz	
Antistatic, Noise	Antistatic: Contact discharge ±4 kV, Air discharge ±8 kV Noise immunity: Power line ±2 kV, Signal line ±1 kV	
Corrosive Gas Resistance	40±2°C / 80±5%RH / 15 ppm (H2S hydrogen sulfide gas) / 96H	
Wi-Fi security	Open/Shared (WEP) WPA-PSK/EAP (AUTO) WPA2-PSK/EAP (AES/AUTO) IEEE 802.1X Authentication	N/A
Supported Software	Client software that supports MTConnect ver.1.3.1 and later verified software: • Fanuc MT-LINKi ver.3.6 and later • iQ Edgecross MTConnect Data Collector ver 1.1.3.0 and later • Device Explorer OPC server V6.2.0 and later and Device Gateway V2.2.0 and later (Takebishi) • IoT Data Share Ver.1.14.1 and later (Denso wave)	
Supported Hardware	Supported CNC device: Fanuc's and Brother Industries' CNC devices*4 Supported signal towers: Patlite's AirGRID**5	
Warranty	5 years	

*1: To use RS-485, a communication program is additionally needed.

*2: Able to operate at a temperature of max. 55°C when a sizeable amount of data (dozens Mbps) is not consecutively sent or received over the wireless LAN.

*3: As of February 2022.

*4: Please check FBR converter's application note for supported CNC devices.

*5: Any maker's signal towers can be used via the digital interface of FBR converter.

OPC UA Specifications

OPC UA4MT	OPC UA Server	ver. 1.0.3
	Number of OPC UA client	Up to 5 simultaneous connections
	OPC UA transfer protocol	UA Binary
	Data Acquisition Method	Query/Polling/Upon startup
OPC UA	Self-Signed Server Certificates	Supported
	Exporting Server Certificate	Supported
	Importing Client Certificate	Up to 5
	Security Mode	None/Sign/SignAndEncrypt Basic128RSA/256/256SHA256
	Authentication and Data Signature	Supported (with sign mode)
	Data Encryption	Supported (with SignAndEncrypt mode)
umati	Version	OPC 40501-1 UA for Machine Tools ver.1.0
	Read/Write	Read Only *7
Supported CNC Data Collection	Interface	Ethernet/LAN RS-232C/DPRNT
	Supported CNC	The Following FANUC CNC 30i-MODEL A, 30i-MODEL B 31i-MODEL A, 31i-MODEL B 31i-MODEL A5, 31i-MODEL B5 32i-MODEL A, 32i-MODEL B 35i-MODEL B 0i-M/T MODEL F, 0i-M/T MODEL D
	Number of CNC Devices	Up to 3
Data Collection	CNC Data	Supported *8
	PMC Data	Supported *8 (with setting tool)

*7: Specification when OPC UA activation is released.

*8: There is a difference in the information that can be collected from the FANUC CNC device between the standard specification (without activation) and when OPC UA activation is applied. Please check the product page on silix website for details.

FBR Converter Activation Comparison

Features	Standard (without activation)	Brother Activation	Murata Activation	OPC UA Activation
Supported Machines	FANUC	BROTHER	Murata Lathe Machine & Loader	FANUC
RS-232C/DPRNT	Yes	N/A	N/A	N/A
Patlite AirGRID® Support	Yes	N/A	N/A	N/A
IoT Comm.	MTConnect	MTConnect	MTConnect	OPC UA

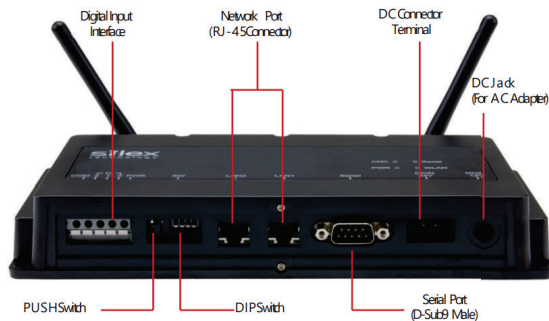
Accessories / License / Software (Sold Separately)

Product	Model	Description	Price
AC Adapter	WB-18D12RU-ECAA	AC adapter and power code supporting JP, US, EU and CN	Open
Antenna	Dust/Waterproof Antenna	IP 67 rated antenna x 1, 2.9m cable x 1	Open
License	Activation for Brother Industries	Activation key to enable connection with Brother Industries' CNC devices	Open
License	Activation for Murata Machinery's machine tools *6	Activation key to monitor Murata Machinery's original system	Open
License	Activation for OPC UA Communication *6	Activation key to enabling OPC UA Communication	Open
License	Activation for ModbusTCP Communication *6	Activation key to enabling ModbusTCP communication	Open
License	Development kit	Development environment, DVD including documentation	Open

*6: Required per main unit.

External Interfaces

(Antenna is included in only FBR-100AN)



Any questions about the product?
Contact our customer support team!

<https://www.silixtechnology.com/support/contact-silix-support>

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