

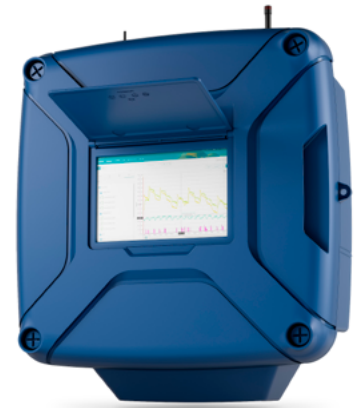
# NetMCU™ Main Control Unit powered by NetBeat™

The first irrigation system with a brain



NetBeat™, the first irrigation system with a brain, is an irrigation and fertigation management system that combines: monitoring, analysis and control in a closed loop system.

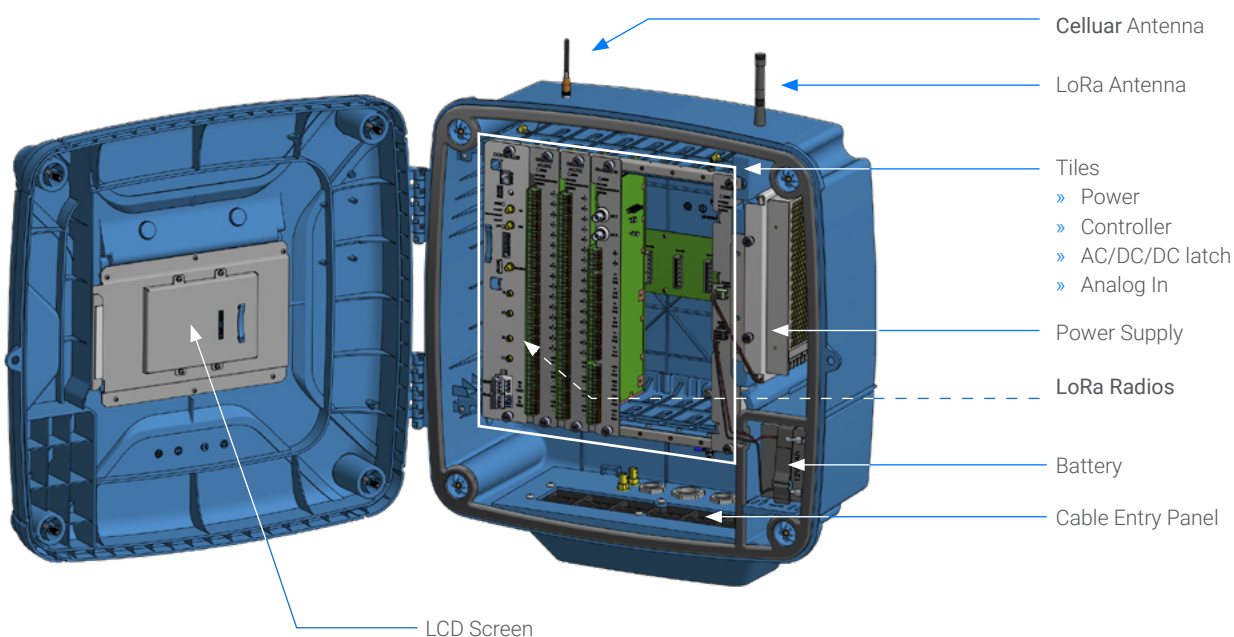
NetMCU™ is the heart of the system and manages all field activities, as well as communication to field components and to the cloud.



## Features & Benefits

- » Fits all farms – no matter how large or complex
- » Manages both irrigation and fertilization
- » Controls single and multiple main lines
- » Collects data from a wide range of sensors e.g. flow, pressure, soil moisture, plant and weather station etc.
- » Activates local and remote devices such as pumps, dosing systems, main valves, field valves, filters etc.
- » Sends crop alerts
- » Sends hydraulic system alerts
- » Works online or offline
- » Enables remote over-the-air updates and maintenance
- » User friendly interface
- » Easily expanded to control larger areas
- » Compatible with RadioNet and SingleNet remote devices
- » Advanced communications options (WiFi, Bluetooth, Cellular, Ethernet, LoRa RF, RS-232, RS-485) for communicating with the cloud and controlled units

## General Description



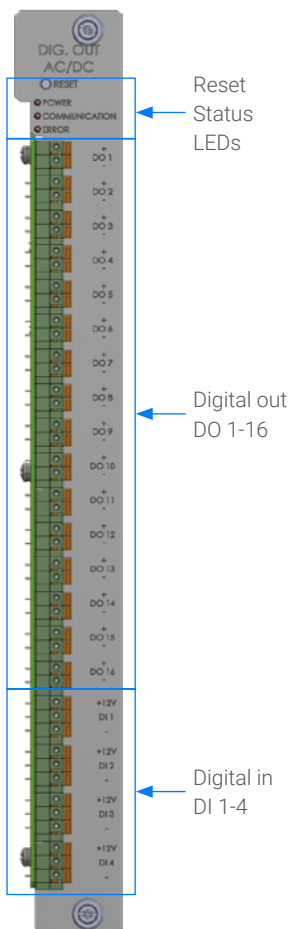
## MCU – AC/DC/DC latch tile

Serves mainly for controlling valves, pumps, dosing systems, etc.

Parameter	Rating
Number of outputs	16
Output voltage	24 DC/AC/PWM
Max output current per ch.	1500 mA
Frequency	50/60 Hz
Max switching frequency	2.5 Hz

### Digital Inputs

Number of inputs	4
Nominal voltage of inputs	12V
Max sample rate	472 Hz
Signal voltage "0"	<0.8 V
Signal voltage "1"	>2.1 V



## MCU – Analog In Tile

Serves mainly for external data input into the system.

### Analog Channels

Parameter	Rating
Number of analog inputs	6
Channel Type	-5mV - 15mV
	0-10V
	0-20mA

### Thermocouple

Parameter	Rating
Models	PT100/1000/10000, 0-2000hm, 0-30kOhm
Output current	120 mA
Sensor power supply	3.3 – 12 Vdc

### Digital Inputs

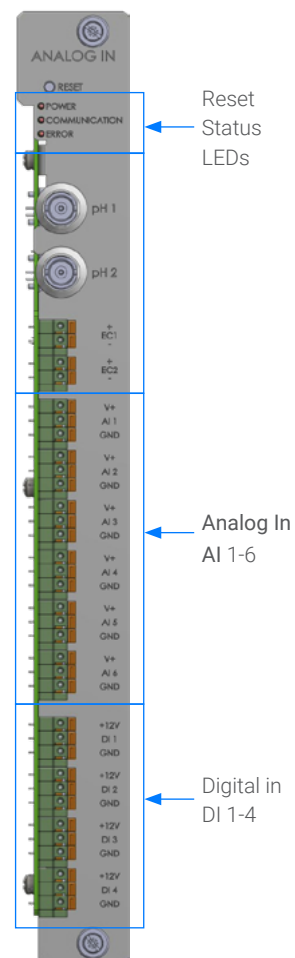
Parameter	Rating
Number of inputs	4
Nominal voltage of inputs	12V
Signal voltage "0"	<0.8 V
Signal voltage "1"	>2.1 V

### EC Channel

Number of inputs	2
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### pH Channel

Number of inputs	2
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## MCU – Power Tile

The Power tile receives 12VDC input voltage from the Power Supply. It supplies the voltage to all tiles and charges the backup battery with 12VDC output voltage. MCU max power is 100W at 45°C (113°F)

### MCU Power Supply

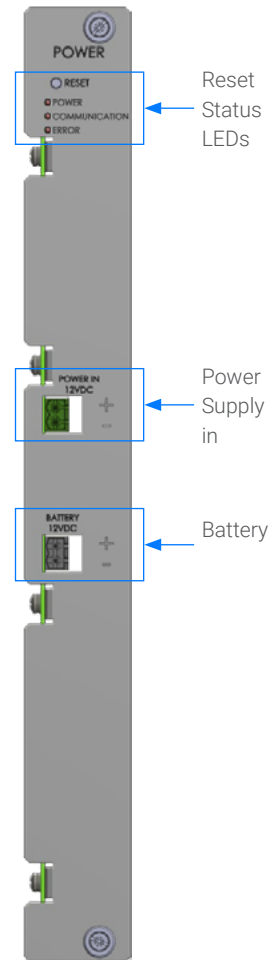
Parameter	Rating
<b>Input</b>	
Voltage range	90 ~ 132VAC / 180 ~ 264VAC, by switch
Frequency range	47 ~ 63Hz
AC current	4A/115VAC 2.2A/230VAC

### Output

DC voltage	12V
Current range	0 ~ 17A
Rated power	204W

### MCU backup battery

Parameter	Rating
Nominal voltage	12V
Nominal capacity	5Ah (20hr)



## MCU – Controller Tile

Responsible for all communications between the components of the controller, and the cloud.

### CPU Specifications

Parameter	Rating
Model	MSC SM2S-IMX6-133
Processor	Dual ARM Cortex A9 – 1GHz
Internal Memory	2GB DDR3
Flash	4GB
External Memory	MicroSDHC card
Operation System	Linux

### Cellular

Parameter	Rating
Model	Quectel EC20 / EC25
Frequency Bands	UMTS: 800/850/900/1900/2100 GSM: 850/900/1800/1900
Output Power	Class 3 (24dBm +1/-3dB) for UMTS bands Class 4 (33dBm ±2dB) for GSM 850/900 Class 1 (30dBm ±2dB) for GSM 1800/1900

### LoRa

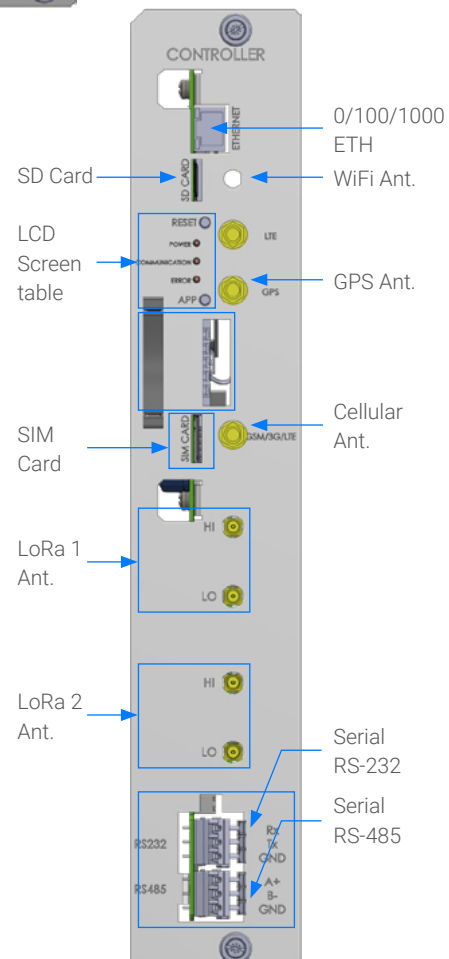
Parameter	Rating
Model	Samtech SX1726
Frequency	868/915/433 MHz
Output Power	14/20 dBm
BW	125,250,500 kHz
Spreading Factor	7 - 10

### BLE/ WiFi

Parameter	Rating
Model	Azurewave AW-CM389MA
WiFi Standard	802.11a/b/g/n/ac
Bluetooth	V4.2

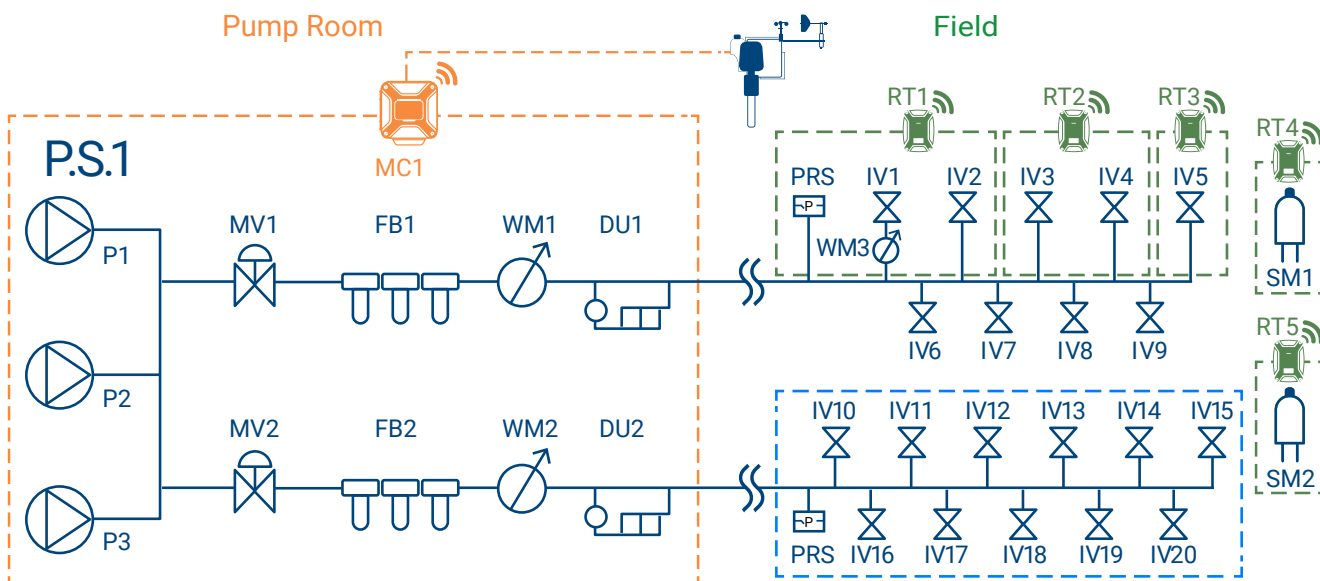
### Additional Features

- » LAN
- » RS-485
- » RS-232



## System Architecture

Example of a typical farm managed by NetBeat™



### Legend

Radio control - NetBeat NetRTU		Line control - SingleNet			
<b>MC</b>	NetMCU	<b>FB</b>	Filter Battery	<b>WM</b>	Water Meter
<b>RT</b>	NetRTU	<b>DU</b>	Dosing Unit	<b>TM</b>	Tensiometer
<b>PS</b>	Pump Station	<b>IV</b>	Irrigation Valve	<b>WS</b>	Weather Station
<b>MV</b>	Main Valve	<b>SM</b>	Soil Moisture Sensor	<b>PRS</b>	Pressure Sensor

### Netbeat system main components

At the heart of the NetBeat system is the NetMCU, Netafim's flagship controller, accompanied by NetBeat Remote Terminal Units (NetRTU).

## Specifications

<b>Power supply</b>	Main power (100 to 250 VAC 50/60Hz) 10-15 VDC (Battery & Solar panel)
<b>Touch screen</b>	Optional
<b>Operation Temperature</b>	With touch screen: -20°C - 55°C / -4°F - 131°F Without touch screen: -20°C - 65°C / -4°F - 149°F
<b>Dimensions</b>	635 x 573 x 252 mm (25 x 22 9/16 x 10")

### Easy expansion

Based on internal, easy to install, I/O tiles. Integrates 2 types of I/O tiles (optional 6 tiles per NetMCU)